ADDIS ABABA UNIVERSTY

COLLEGE OF NATURAL AND COMPUTIONAL SCIENCE

DEPARTMENT OF ZOOLOGICAL SCINCE

Human Wildlife Conflict and Its Implication for Conservation around Chebera Churchura National Park, Konta Special District in Southern Nations Nationalities and Peoples Region(SNNPR),Southern Ethiopia.

Gizachew Girma

A Thesis Presented to the School of Graduate Studies of the Addis Ababa University in partial fulfillment of the Requirements for the MSc in General Biology.

Sept. 2016

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Advisor Dr. HabteJebessa

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DECLERETION

I confirm that the work presented in this thesis is my own. Where information has been derived from other source, no part of this thesis has been submitted to any other university.

Name Gizachew Girma

Signed----------

Date----------

Supervisor Dr. Habte Jebessa

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Date----------

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ACRONYMS

CCNP Chebera Curchura National Park.

HWC Human Wildlife Conflict.

IUCN International Union for the Conservation of Natural Resource.

NP National Park.

WL Wildlife.

WWF World Wide Fund for Nature.

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ABSTRACT

An investigation on human-wildlife conflict was carried out in CCNP in 2016/2017 in four randomly selected villages (Serri, Chewada, Churchura, and Chebera) around the park. The purpose of the study was to investigate the impact of human-wildlife conflict around Chebera Churchur National Park. The study objectives were to identify the major problems that occur due to wild mammals, to investigate the effect of wild-mammals on the livelihoods of the people around CCNP and to suggest some possible solution for human wildlife conflict. The research used descriptive method and data were collected using questionnaires, interview, and filed observation. The target population of the study were 1032 (one thousand thirty two) households from four rural villages closer to the park. This study used a sample size of 164 respondents out of which 154 questionnaires were filled and returned.Crop damage and human disruption are the major difficulty in the area. The most responsible identified wild mammals for conflict were Anubis baboon, Vervet Monkey and Wild Pig. The majority the respondents 86 (56%), suffering from crop damage. Most of the respondent (65%) had negative attitudes toward problem posing animal. The Most raided crops were Maize (80%) and Banana (63%).Guarding, fencing, and different deterrent methods are used for defending crop damage by wild animals. Thus, encouraging local communities to grow unpalatable crops to wild animal, to cooperatively guard their crop and to changing their farming practice to cash crops like, Coffee and Chat is important to reduce the challenges associated with crop raiding by wild animals.

Key words: Conflict, protected area, crop loss and crop riders.

1. INTRODUCTION

1.1. Background of the study

Human-wildlife Conflict is defined as any interaction between humans and wildlife that results in negative impacts on social, economic or cultural life, on the conservation of Wildlife populations, or on the environment (WWF, 2005). It affects both wild animal and human being and also economy. Human-wildlife conflict causes various negative results both in human and wildlife. The major outcomes of human-wildlife conflicts are crop damage, livestock depredation, damage to human property and collapse of wildlife population (Woodroffe, 2013).

Human-wildlife conflict is a universal problem and it vary according to geography, land use patterns, human behavior, and the habitat and behavior of wildlife species or individual animals within the species (WWF 2005).

Human-wildlife conflict has been in existence for as long as humans have existed and wild animals and people have shared the same landscapes and resources. The fossil record shows that the first hominids fell prey to the animals with which they shared their habitats and shelters. For instance, forensic evidence has recently shown that the Taung skull, perhaps the most famous hominid fossil which was discovered in South Africa in 1924, came from a child killed by an eagle two million years ago (Berger, 2006). Today, there is no corner of this earth where human –wildlife conflict does not exist in one form or another. In America, Bears raid dustbins in the national parks and even at the edge of towns in the northern USA, waking up residents and creating disorder in the streets. In the USA too, deer collisions with automobiles injure an average of 29,000 people annually and cause more than US$ 1 billion in damages (USDA, 2004).

In Alberta, Canada, over a period of 14 years (1982-1996) wolves caused 2,806 deaths among domestic animals, mainly cattle and to a lesser extent dogs, horses, sheep, chickens, bison, goats, geese and turkeys. In Idaho, Montana and Wyoming (USA), during a similar time period (1987-2001) wolves killed 728 animals, mainly sheep and cattle (Musiani *et al*., 2003).

In Australia direct use of forage by wild rabbit's results in fewer livestock, lower wool clip per sheep, lower lambing percentages, lower weight gain, lower wool quality and earlier stock deaths during droughts. (Williams *et al.,* 1995).

Human wildlife conflict is of increasing concern in several or many parts of the world and has been the focus of recent conservation efforts (Else and Lee, 1986; Naughton, 1998). With increasing human populations especially in the developing world more human and wildlife populations are coming into direct competition for resources (Strum, 1987). Crop raiding can be simply defined as wild animals moving from their natural habitat into agricultural land to feed on the crops that humans grow for their own consumption and trade (SilleroZubiri and Switzer, 2001). Some of the more dramatic cases like the swarms of locusts that devastate large swaths of crops in many parts of the world, tend to receive wide coverage in the media. However, crop raiding by vertebrates such as birds and mammals is also becoming a major issue (SilleroZubiri and Switzer 2001).

Ethiopia is one of the most physically and biologically diverse countries of the world. It has an area of over 1,023,050 km2. It comprises highland massive surrounded by arid lowlands. It contains various wildlife and wildlife habitats ranging from alpine moorlands to lowland savannas and arid lands, and extensive wetlands (Yalden, 1983). Most highlands harbor many endemic plants and animals. They have fewer species diversity than the lowlands in the country. The main reason for the presence of diverse wildlife and large number of endemic species is the rugged topography. This helped to create isolated and varied ecological situations. The biological resources are distributed in different biomes mainly the Afro tropical highlands, the Sudan-Guinean, the Sahel-Transitional Zone and the Somali-Masai Biome (Malden *et al*., 1996). Ethiopia consists of 861 species of birds, 277 species of mammals, 201 species of reptiles, 63 species of amphibians and 150 species of fish (Hillman, 1993). Among these, 31 mammals, 16 birds, 24 amphibians, 9 reptiles and 40 fish are believed to be endemic (Hillman, 1993). This biodiversity is not evenly distributed in the country. For instance, large mammal species are common in the arid southern part. On the other hand, there are many smaller numbers of species in the highland where there is high population. For millennia, the natural ecosystems of Ethiopia have been altered because of human and natural factors. Most of the highlands and some of the lowlands have been converted into agricultural and pastoral land. The vegetation has been used for fuel wood, construction and other purposes. As a result, wildlife resources of the country are now largely restricted to a few protected areas (Hillman, 1993a). In Ethiopia, the total area assigned for wildlife conservation is only 22,829 km^2.CCNP is also one of the national park established in 2005. This study aims to investigating the impacts of human wildlife conflict and

assessing its implication on the conservation of wildlife around CCNP in southwestern Ethiopia. This study is expected to an overview the current human-wildlife conflict in CCNP and provides possible measure to mitigate the conflict between people and wildlife in the area.

1.2. Statement of the problem

One of the major sources of conflict of human- wildlife in Africa and in the world at large is crop raiding (Hill *et at,* 2002, Warrens, 2003). Increasing resource use by humans at the human wildlife interface has results in intensification of human-wildlife conflict (Inskip and Zimmernna, 2009). Human- wildlife conflict is more intense in developing countries where livestock holdings and agriculture were important parts of rural people's livelihoods and income (Boer and Baquete, 1998). In these regions, competition between local communities and wildlife for the use of natural resource is particularly intense and direct. As a result, resident human populations or wildlife is vulnerable (Messmer, 2000).

Increasing in human population and the expansion of agricultural land has forced wildlife into modified habitats. Some primate species find crops palatable and these are ones that become pests (Demment, 2000). Peoples live around CCNP were commonly practice agriculture as a result the need of far mining is increased from day to day hence, the local people forced to clear the nearby forest this activity increase human-wildlife conflict in the area.

1.3. Objectives

1.3.1. General objective

The general objective of the study was to assess human-wild la mammal conflict around Chebera Churchura National park.

1.3.2. Specific objectives

The specific objectives of this study were:-

To determine the main causes of human-wild mammal conflict around CCNP.

To identify wild mammal species that pose major conflict around CCNP.

To investigate the effect of wild mammal on the livelihoods of the people in the area.

To suggest some possible solution for human-herbivore conflict in the area.

2. LITERATURE REVIEW

2.1 Concept and definition of human-wildlife conflict

Human-wildlife conflict (HWC) is a term commonly used by conservationists to describe friction between wild animals and people. It exists in different forms all over the world and is experienced more in developing countries (Blair, 2008). Various definitions about the term have been forwarded by different researchers and organizations working on the area.

To begin with the world largest conservation organization definitions, the World Wide Fund for Nature defines it as any interaction between humans and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment. According to the WWF human-wildlife conflict is a kind of conflict that can be triggered by humans or wildlife and have a negative repercussions on both parties that involved in the conflict (WWF, 2006).

Similarly, the United States Geological Survey (2003) in its review accentuates on the need to reckon the two contexts, i.e., actions by wildlife with human goals and human activities threaten the safety of wildlife in defining the term. Thus, they defined it as: Human-wildlife conflict occurs when the needs and behavior of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife. Human responses to the interaction are the most decisive factor for the outcomes of the conflicts between humans and wildlife (USGS 2003).

2.2. Causes of human-wildlife conflict

Different researchers at different times have investigated the determinant factors that cause conflicts between human and wildlife in their respective research sites. The following section briefly summarizes the main causes of human-wildlife conflict as identified by different researchers across the globe in general and Ethiopia in particular.

A research conducted by Gobosho (2015) showed that habitat destruction, proximity to natural forest and increased subsistence utilization as the major causes of HWC in the study area.

The main cause of human-wildlife conflict worldwide is the competition between growing human populations and wildlife for the same declining living spaces and resource (Madden, 2008). The transformation of forests, savannah and other ecosystem in to agrarian areas or urban

agglomerates as a consequence of the increasing demands for land, food production, energy and raw materials has leads to dramatic decrease in wildlife habitat(Sillero-Zubiri and Switzer,2001).

The major causes of human-wild animals conflict could be attributed to many factors ranging from wild animals population increase to human population increase (Edward and Frank, 2012).More peoples means more cultivated land and hence a greater interface between people and wildlife. The world population is predicted to grow by over 50% in the next fifty years, from six billion in 2000 to over nine billion in 2050 and the increment in both wildlife and human population create competitions on fixed natural resource which leads to conflict (Sillero-Zubiri and Switzer, 2001).

The consequences of human-wildlife conflicts are crop destruction, livestock predation, human death and injuries are sometimes recorded. For example in Cameroon wildlife species responsible for human deaths and injuries include elephants, buffalo, lions and hippopotamus (Lamarque et al.,2009*).*Human-wild animals' conflicts were happened when the actions of humans or wild animals have an adverse impact upon the other. It recognized that humans have profoundly impacted wildlife and the environment in many ways, through habitat loss, pollution, introduction and spread of exotic and invasive species, overexploitation, and climate change. Human-wildlife conflicts vary according to geography, land use patterns, human behavior, and the habitat and behavior of wildlife species or individual animals within the species (IUCN, 2005).

Crop raiding is not a new phenomenon and it has most likely been occurring since humans started practicing agriculture (Joseline, 2010). Human-wildlife conflict is severe around CCNP particularly Chewada and Serri villages because the villages were very close to CCNP.

2.3. The impacts of human-wild animals' conflict on humans

The outcomes of the conflict between humans and wildlife can have overwhelming impacts on the social, economic or cultural of humans. As noted by Gobosho (2015) the impacts range from clear-cut economic hardship to less tangible effects such as increased opportunity costs and decreased quality of life. Living alongside of wild animals can incur a variety of additional costs aside from the direct impact of depredation . According to Gobosho (2015)

this event may even result in humans property damage, economic losses related to crop raiding, and harassment.

Mesele Yihune (2006) states that the conflict between humans and wildlife can cause many damages to the well-being of humans in diversified directions. It may cost humans in losses of life to drastically change of life patterns. According to Mesele Yihune (2006) Carnivores encounter more domestic animals and humans. Such encounter can cause danger to human and also increase economic loss. Similarly, Madden (2008) also stated that the conflict between human and wildlife may results in negative impact on people or their resources. The major types of wildlife damage on the human being are predation of domestic animals, crop damage and sometimes killing of humans.

2.3.1. The impacts of crop raiding wild animal conflict

This is the major types of human- wildlife conflict large mammals cause crop loss near protected areas among agriculturalist in many parts of Africa and Asia. The extent of damage is almost significant when it is considered at the global level as compared to the damage caused by invertebrates and rodents. However in the area where large number of animals occurs, the whole season production may be lost in a single night (Naughton- Treves, 1997).

Wildlife damage varies considerably from site to site and farmers have unequal capacity for preventing losses. Farmers themselves are sometimes, the cause for crop loss because they continuously charge the vegetation structure of the land closer to the protected areas. This changed vegetation probably become attractive to wild herbivores (Messmer, 2000).

Crop raiding and hunting may be closely linked,crop raiding can reduce farmers' tolerance towards wildlife. Despite high population density in rural areas and more rapid conversion of forest to farmland, much less is known about crop raiding in Asia and Africa (Linkei, 2007).

Despite the human wild-animal conflict has not be adequately monitored systematically or assessed quantitatively (Hoare, 1995). The damage caused by problem animals range from 10% depending on location and crop type .Naughton-Treves (1997) observed that crop loss caused by park animals along Kibale National Park boundary is between 4-7% with equal to nearly US$6 per farmers or US$ 100 per kilometer of boundary per year. Damiba and Abes (1993) noted that

production of highly palatable and nutritious seasonal crop such as maize, which attracts primates and other wild-animal involve heavily losses and therefore high guarding investments. Farmers' loss a whole garden particularly in areas highly infested with Baboons, Vervet monkeys, Bush pig and Porcupines, which inflict heavy and potentially catastrophic losses

Nchanji (1998) reported that crop raiding is a serious problem as crop raiding animals can have a devastating impact on the standard of living of peasants whose entire survival is dependent on subsistence agriculture .He estimated that in situation where farmers guarded their crops, the loss incurred was 30% and where was no guarding at all it was 90%. There was severe food shortage, high food price, malnutrition and morbidity increased besides the rural agricultural society becoming poorer and poorer. Majority of children not going to school and in situations where farmers guarded their crops, children were forced to absent from school to guard crops (Chambers 1992).

2.4. Impacts of human wildlife conflict on wildlife and nature conservation

Human-wildlife conflict is an increasingly significant obstacle to the conservation of wildlife and hence may result in radical decrease in the number of wildlife population. This was reported by various scholars who conduct a research in the area. For instance, Gobosho (2015) states that human-wildlife conflict is among the most important threats to the survival of many wildlife species.

Development including construction of roads, dams and utilities support human beings to accomplish the daily activities. But, these activities weaken the long term sustainable development by propagating unintended environmental impacts. Development often result in uncontrolled secondary human migration, illegal logging, hunting and resource extraction in general (Anonymous, 2001)

Human-wild animal conflict is an increasingly significant obstacle to the conservation of wildlife (Madden, 2008) Human being can be developing a range of options for attempting to lessen conflict with wildlife. The options includes reducing the livelihood of attacks through livestock guarding dogs, electric fencing, improved construction of livestock enclosure, toxic collars, disruptive stimuli and other aversive techniques. All these can have substantial impacts on the wild-animal populations (Dickman, 2008; Eyebe *et al* .,2012).

Given the intensity of conflict that frequently arises when people and wildlife exist in close proximity to one another, concentrating on maintaining wildlife largely within the worlds current protected areas may seem like an obvious solution (Baldus 2004). The broad scope of the current protected area network, which covers over 11% of the Earth's surface (Chape *et al*. 2003), that alone is unlikely to be sufficient for the long-term conservation of many of these threatened species. Firstly, formal protection may not translate into effective conservation on the ground, especially in areas where local people need to utilize reserves for resources such as firewood, honey or for subsistence hunting (Green 1994; Nowell and Jackson 1996). Also, large-bodied species in particular often have vast home ranges, and the small sizes of many reserves are inadequate for their long-term conservation (Brashares*et al*. 2001; Woodruff and Ginsberg, 1998).

2.5. Public attitude towards wildlife

Now days the conflict between local people and wildlife is taken as the major conservation issue (Newmark*et al* 1993). The conservation attitude of rural people living near to the protected area is highly influenced by the problem associated with wildlife people living surrounding the protected areas who are unable to control the losses caused by wildlife are likely to develop negative attitude toward wildlife (Newmark*et al*, 1993, 1994).

Communities with subsistence economy even small losses can generate strong negative attitude toward wildlife (Oil *et al*, 1994).

Human attitudes and values about wildlife vary both among and within different sectors of the society. The views of rural residents about wildlife may not differ from urban residents except that they personally experience more of the benefits and problems caused by wildlife. However farmers are one sector of the society whose attitudes about wildlife continue to different from other stakeholders. They continue to view in terms of its importance and tend to be more concerned about how wildlife affects them economically (Messmer, 2000).

Whatever the case, public understanding of the general environment and population related issues is critical for successful conservation efforts, for this the perception of local people towards crop riding wild animals should be studied.

2.6. Knowledge gap identified

Several studies on human wildlife conflict have been conducted and scholars studying different issues. According to Amelia Jane dickman in her study" Determinants of conflict between people and wildlife, particularly large carnivore 'in her study the driving factors of human wildlife conflict are; intolerant pastoralists with their history of land alienation for conservation, political marginalization and insecurity of land tenure. According (Sindiga, 1995) and (Mwale, 2000) shows that human encroachment on critical biodiversity depository sites in search of agricultural land has since the 1970's and 1980's shifted to low potential rangelands which coincidentally are the prime wildlife ecosystems thus creating a myriad of problems like competition for water resources, human wildlife conflicts, habitat fragmentation and blocking of wildlife migratory routes and dispersal areas and negative perception towards conservation. From the various studies for instant stated above there is a knowledge gap in that most scholars have embarked on studying on the consequences and impacts of human wildlife conflict and those who have discussed on the factors like Dickman and Sindiga, they have specified on the type of wild animal they want to look at and relating encroachment to a factor leading to competition over resources, habitat fragmentation and wildlife migratory corridor, all those a major factor contributing to human wildlife conflict.

2.7. Strategies to Mitigate Human-Wildlife Conflict

Various suggestions have been made by researcher from different corners of the world on effective strategies that help to mitigate human wild life conflict. This section presents some of the empirical findings of researchers dealing with this case in different parts of the world.

McGregor (2005) highlighted the need for greater attention to the pestilence discourses that can flourish among marginalized local communities sharing space with dangerous animals, and to the cultural, economic and political contexts, and global connections that produce them. Such discourses may involve a much greater sense of reciprocity with the animal world than is common in the West, in which the actions of culturally embellished animals are fearfully entangled in understandings of social relations.

Increased diversity of stakeholders has created new management dilemmas regarding the use of traditional approaches to managing wildlife. In some cases, population management techniques

such as hunting, fishing, and trapping are becoming increasingly unacceptable. Increased concerns for privacy, property damage, and safety may result in exacerbating the conflicts (Messmer*et al*., 1997). Elements of a successful conflict management process include: (1) identification of clearly defined objectives; (2) establishment of clear definition will be made, prior to dealing with the issues; (4) inclusion of team building activities; (5) maintenance of continuity by not allowing substitutes; (6) implementation of guidelines and activities that promote active listening; and (7) achievement of success with smaller issues prior to addressing larger concerns (Guynn, 1997).

To succeed in this environment, wildlife managers may need to shift their focus from trying to maximize wildlife population to the more difficult one of trying to optimize wildlife values for society. A major difficulty in trying to achieve this optimization is that the benefits and liabilities have not been evenly distributed between different segments of society.

3. THE STUDY AREA AND RESEARCH METHODOLOGY

3.1. Study area

3.1.1 Location

Chebera Churchura national park is found within the south western side of the central Omo Gibe basin, in between Dawro zone and Konta special district of southern national nationalities people regions, Ethiopia. Chebera-Churchura National Park was established in 2005. It covers an area of 1215 km^2 that ranges in altitude from 700 to 2450 meter above sea level (Timer, 2005). CCNP is bordered by Konta special district to the north, Omo River to the south, Dawro zone to the east and southeastern Agare High Mountain and Omo River to the west (Woldeyohans, 2006).

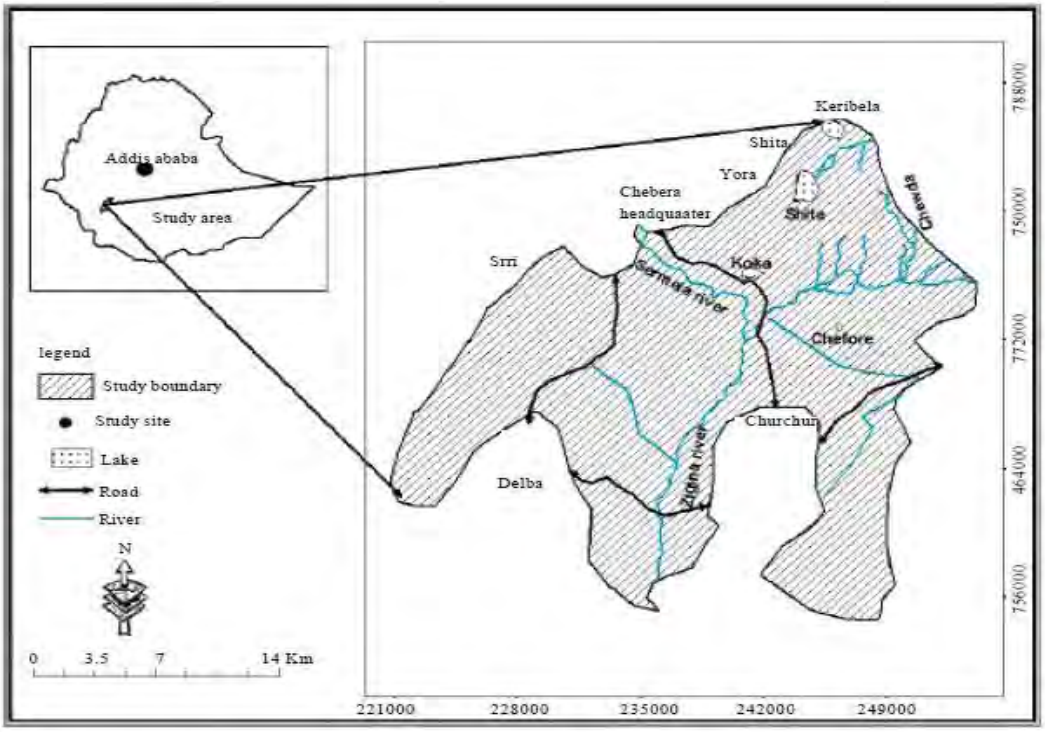

Figure 1. Map of Chebera Churchura National Park and the surrounding villages including the study area.

3.1.2 Geographical feature

CCNP is fortunate in possessing numerous Rivers, streams and small creator lakes which are reason for the rich wildlife resources of the area. Zigina River is rises from the north east high lands of the area and cross the central part of the park and feeds the Omo River.

Shoshuma River is rises from the north western highlands of the Konta and mixed with zigina River inside the park, which go down together to Omo River They cultivate cereals,fruits, coffee and root crops(Timer,2005).The altitudes of the park ranges from 550-1700 m.a.s.l and a highest peak being at a Mechal hill on the western boundary (Timer,2005). The climate of study area is characterized by a relatively hot climatic condition. The rainfall distribution is unimodal between April and August. The average annual rainfall in the area varies from 1000 to 3500mm.

3.2. Methodology

3.2.1. Sample Size

The target population of this study consisted of four randomly selected rural villages near to the CCNP as shown in Table 1. Target population comprised of 1032 households from four rural villages around to CCNP of which a sample population of 164 was taken.

Totally, 164households (about 16% of the total number of study population) were included in the questionnaire, of which 101(62%) and 63(38%) were male and female respectively.

Table 1**.** Sampling table

Four selected villages adjacent to CCNP	Population size	Sample size
Seri	256	41
Cebera	307	48
Chewada	193	30
Churchura	281	45
Total	1032	164

3.2.2. Data collection

The present study was carried out by means of questionnaire, interview and field observation/direct assessment modified from Newmark*et al.* (1994) and Maddox (2003).

Pilot survey

Pilot survey was conducted around the Chebera- Churchara national park in November 2015, based on the information gathered during the preliminary survey. During the pilot survey, 20 individuals were randomly selected and interviewed in the study area. The main purpose of the pilot survey was to evaluate the questionnaire and to check whether it is applicable and suitable in the study area.

It is also used to check the question understood by the selects individual the pilot survey was also used to identify the period and areas of human- wildlife conflict. Then based on the result from the pilot survey the questionnaire was modified and developed.

Questionnaire survey

Questionnaire survey were used to acquire information on the various aspects of the study about the different variables with the questions being both open and close ended. The questionnaire survey was carried out between December and January among local community and strictly in all four villages. Interviews held to farmers were conducted to establish in depth information about the impact of human-wildlife conflict in CCNP.

The study was able to get a response from 154 respondents out of 164 questionnaires distributed to four rural villages around the park; this represents a response rate of 93%of the total questionnaires distributed. The rest of respondents did not return the questionnaires citing forgetfulness and lack of time. However, the achieved response rate was considered credible enough to provide the basis for arriving to the conclusions of the student

The structured questionnaire was administrated to members of households at random manner based on the first come first serve basis (Newmark *et al* ,.1994). Alternating adult male and female respondents as much as possible.

Filed Observation/ Direct assessment

Field visits and observation were mainly used to confirm the respondent's responses, so that accurate and reliable information would be collected during filed observation. The observation was carried out in two randomly selected villages, (Serri and Chewada) two times per week in June 2016. Observation also important to obtain data on, distance between park and farm lands, the affected crops nature of wild animals and frequency of coming crop raiding wild animals to farm lands.

3.4. Data analysis

The data were analyzed using SPSS version 20 computer software program. Statistical tests were two-tailed, with significance level set as P=0.05. Data were analyzed using descriptive statistics and response compared using chi-square and ANOVA test for different variables. The chi-square was used to test two variables and ANOVA was used to test more than three variables. The finding presented in table, figure and pie chart to enhance compression and interpretation.

4. RESULTS AND DISCUSSION

4.1. The causes of human-wildlife Conflict around CCNP

4.1.1. Competition over resource

Most of the respondents, (98%) do feel that competition over resources between human and wildlife reason for human- wildlife conflict around the park .0nly 2% of the respondents noted competition was not a source of conflict between human and wild-animals.Wild animal move from their restricted natural habitat into farm land to feed on the products that humans grow for their own consumption (Ojo *et al*., 2010). This was also true in the study area; most crop raiding wild animals were visits agricultural land and damage crops in the study area.

Humans have lived in close relationship with wildlife and have shared resources like space, habitat and food for a long time, which have stiffened to a nearly perfect competition (Knowledge Base Report 2003).

Table 2. Wild-animal competition over human resources.

Respondents response	**Frequency**	**Percentage**
Yes	151	98%
No	3	2%
Total	154	100%

4.1.2. Different threats caused by wild-animals as a factor for human-wildlife conflict

Threat of wild-animals is given in Table 3. The threat includes crop loss, livestock depredation and human safety. Most of the respondents 86(56%) noted that crop loss was the major threat to the study area whereas, 53(34%) of respondents noted threat to livestock in . Few respondents 15(10%) noted threat to human .The result in the Table 3 indicates that crop loss was the major form of impacts that trigger human-wildlife conflict around CCNP. This was because of most of the peoples live around CCNP depends on agriculture and the park holds variety of crop raiding wild animals. The result confirmed with Boer and Baquete (1998), human wildlife conflict is more intense in developing countries, where agriculture is important components of the rural population.

Table 3. Threats of wild-animal on the local people**.**

Threats of wild animals on the local people	Respondents response	
	Frequency	Percentage
Cope loss	86	56%
Threat to livestock	53	34%
Threat to human	15	10%

4. 1.3. Proximity to the park

According to the respondents, (40%) of the farmland was more close to the park, being near to the park has its own contribution for crop damage by wild animals, followed by less emphasis which is given by park authority (31%), and only 8% of the respondents response indicate poor guarding practiced by farmers. The result agreed with Newmark*et al*., (1994), Rural Africans generally do not want to see wildlife or have wildlife close to protected area due to crop damage and lack of benefits from the sector.

Table 4. Factors that enhance human wildlife conflict around CCNP (N=154)

Factors	Local farmers response		
	Frequency	Percentage	Rank
Proximity of farmland to the park	26	40%	1
Low attention given by Park authority	48	31%	2
Increased habitat destruction	32	21%	3
Poor guarding	12	8%	4
Total	154	100%	

4.2. The major crop raiding wild-animals around CCNP

Based on respondents respons Anubis baboon (*PapioAnubis)* 84%,Vervet monkey (*Cercopithecusaethiops)* 66%,Wild pig (*Sus scrofa*) 60%, Common warthog (*Phacochoerus aethiopicus)*55%, Cape buffalo (*Synceruns caffer)* 53%, Porcupine (*Hysteris cristat)*42%, African elephant(*Loxodonta africana)* 35% and Hippopotamus(*Hippopotamus amphibious)34%,* damaged their crops in different degrees. Farmer's ranked crop raiding wild animals from the

one which causing most damage to the one that cause the least damage (Table4).During the study period , Anubis baboon (84%) Vervet monkey (66%) and the wild Pigs (60%) were the most severe crop raiding wild animals specially in serri and chewada villages .Anubis baboon destroys large mass of crop within the single visit and they ranked in the first place and they ranked Vervet monkey in the second stage in the study area followed by Wild pig, Common warthog, Cape buffalo, Porcupine, African elephant and Hippopotamus respectively.This result agrees with finding of Kate (2012) who reported that Baboons were ranked number one crop raiders in Uganda. Quirin (2005) also revealed that baboons and Vervet monkeys are determined to be the most pest primates among other animals which were responsible for damage crops in Illubabor Zone.

Figure 2. Maize damaged by Wild pig

Figure 3. Maize damaged by Vervet monkey

Table 5. List of crop raiding wild-animals and their respective rank based on the damaged they caused.

Wild animals	Scientific name	Local name	Percentage
Anubis baboon	*Papio Anubis*	Gelleshoo	84
Vevet monkey	*Cercopithecus aethiops*	Qaree	66
Wild pig	*Sus scrofa*	Gudunttaa	60
Common warthog	*Phacochoerus aethiopicus*	Gashoo	55
Cape buffalo	*Synceruns caffer*	Mentta	53
Porcupine	*Hysteris cristat*	Quttarssa	42
African elephant	*Loxodonta Africana*	Dangarssa	35
Hippopotamus	*Hippopotamus amphibious*	Gumara	34

4.2.1.The common crops, raided by wild-animals around CCNP

The result showed that not all crops were equally affected by crop raiders, during the present study (80%) out of 100% of the respondents claimed that maize was the most susceptible crop to crop raiders, followed by Banana (63%), teff (46%) sorghum (45%) potato (42%). Whereas (33%) of the respondents reported that wheat was the least susceptible crop to be damaged by wild animals because, the seeds of wheat is very small, (Table 5).Baboons are likely to visit fields all the year round, and while they eat maize preferentially, they also feed on Banana and potato (Hill, 2002).Thus farmers whose farms are located near to the park boundary, are

potentially at risk of losing staple crops year around. The present study also confirmed the same situation with Warren (2008), who reported maize, banana and potato were the most frequently eaten crop by crop raiding in West Africa. The same was true in the study area, in which maize, banana, teff, sorghum, potato and wheat were highly preferred by most wild-animals.

Table 6. Ranks of crops in the order of destruction by crop raiders (N= 154)

Crop	Frequency	Percentage
Maize	123	80%
Banana	97	63%
Teff	71	46%
Sorghum	70	45%
Potato	64	42%
Wheat	51	33%

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4.2.2. Trends of crop damage by crop raider based on the distance from the park.

The trends crop damage in the last three years were relatively high in two villages Serri(92%) and Chewada (96%). This was because of the villages were located near to the park. The trends of crop damage were relatively low in Chebera (62%) and Churchura (48%), because the villages were relatively far from the park.

By using Chi-square to compare the data there was a significant difference(X^2 =180.987 $p<0.05$) between village distance from the park and extent of crop damage. In many parts of Africa, the conflict between local people and wildlife is the most serious problem, if they are adjacent to nature reserves (Newmark*et al,* 1994). The same was true in the study area. This study also observed that the close proximity between farms and the park resulting in the high level of conflict. Those people are live near to the habitat of wildlife encounter high problem. Eventually those who live near to the park faced frequent crop damage. This indicates that conflict between wildlife and people particularly those who share the immediate boundaries with protected areas into adjacent crop fields, are common phenomena all over the world (Shemweta and kidegesho, 2000).

Table 7. Approximate distance from the park, trends of crop damage by wild animals in the last three years.

Villages	N (154)	Distance from the park	Increase	Decrease	Unknown
Serri	39	0.2 km	36 (92%)	1(2.6%)	2 (5%)
Chebera	45	1.2km	28 (62%)	6 (13%)	11 (24%)
Chewda	28	0.2km	27 (96)	0	1 (4%)
Churchra	42	1.3km	20 (48%)	5 (12%)	17 (40.5%)
Total	154		111 (72%)	12 (7.8%)	31 (20%)

4.3.3. Status of large wild- herbivores in the study area

The replay of local people towards population status of crop raiding animals around CCNP was given in (Table 7). When asked population trends, (60.75%) of the respondents felt that most animal population have increased over recent year. However, (19.25%) of the respondents remarked that the wild animal populations are the same and (13.5%) reflected as don't know only few (6.5%) of the respondents were noted the number of crop raiding animals were decreased.

There is a significant difference (x^2=11.848. P < .05(0.0001) in the distance from the village and population status of crop raiding wild- animals. In Serri and Chewada villages the trends of crop raiders were increased, because the villages were near to the park, while in Chebera and Churchura the trends of crop raiding wild animals were relatively decreased this is because of the villages were far from the park .This result agreed with Mesele (2007) farmlands around the park will become attractive and provide plenty of food source for the crop raiders in Wonji-Shoa Central Ethiopia.

Table 8. Respondents opinions about the status of crop raiding wild animals in the last 3 years (N= 154).

Village	N	Distance from the park	Respondents estimation on crop raiding wild-animals in the last 3 years							
			Increase		Decrease		The same		Don't Know	
		Km	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Serri	39	0.2	34	87%	-	0	2	5%	3	8%
Chebera	45	1.2	17	38%	4	9%	19	42 %	5	11 %
Chewda	28	0.2	23	82%	-	-	5	18 %	-	-
Churchura	42	1.3	15	36%	7	17%	5	12 %	15	35 %
Average				60.75%		6.5 %		19.25 %		13.5%

4.4. The impacts of wild large herbivore upon the local people

4.4.1. Food shortage and low income

Significant determinant of livelihood was availability of food for household consumption. Most of the respondents 88 (57%) mentioned that they faced food shortage due to the damage of crop by crop raiders, 24(16%) noted low income and 42 (27%) of respondents responded loss of sleep, wastage of time and health problem during permanent guarding situation in the study area (Table 8).The result agreed with Hill **(**2000) who reported crop damage affects farmers directly through loss of their primary food and cash resource and indirectly through a variety of social costs such as costs for school and hospital.

Table 9. Effects of crop damage upon the local people.

Effects of crop damage on the local people	Respondents	
	Frequency	Percent
Food shortage	88	57%
Guarding related problem	42	27%
Low income	24	16%
Total	154	100%

4.4.2. Predation of domestic animals and problem on human security

Based on the respondents response 67 (44%) responded crop raider particularly Anubis baboon killed domestic animals, whereas 56 (36%) were responded crop raiders such as Elephants, wild Pigs and common warthogs pose security of problem on human and 3 (20%) of respondents were noted damage of traditional beehives are the major problem that affect the livelihoods of people other than crop loss in the study area (Table 9).The study agreed with study conducted around the Simian Mountains National Park that revealed where 40% of the respondents from Mecheka-Tikurwuha reported loss of sheep and goats to Hamadryads baboon (Mesele, 2006). Likewise the finding done in GGNP (Nigeria) described that baboons preys on domestic chicken and sometimes baboon will attack women and children even up to their house and sometimes kill fowls (Eniang*et al*., 2011).

Table 10. The effects of large wild herbivore up on the local people, other than crop damage

Effects of wild herbivore, other than crop damage	Respondents	
	Frequency	Percent
Predation of domestic animals	67	44%
Problems of human security	56	36%
Damage of traditional beehives	31	20%
Total	154	100%

4.5. Attitudes of the respondents towards wild- animal conservation

Majority of the respondents 96(62%) expressed a negative attitude toward wild animal conservation, whereas only 24(16%) of the respondents expressed positive attitude toward wild-animal conservation. This was because of the wild-animals constantly devastating their crops and the absence of compensation for wild-animal induce damage. Thus, the result indicated the most of the local people looked the wild-animals as a potential enemies to their well-being. The result agreed with Hill (2002), the costs of destruction more often exceeded the benefit to community neighboring the park. Bitter feeling among these communities has eroded local tolerance for wildlife, resulting in negative attitudes toward conservation efforts and aggression towards wildlife.

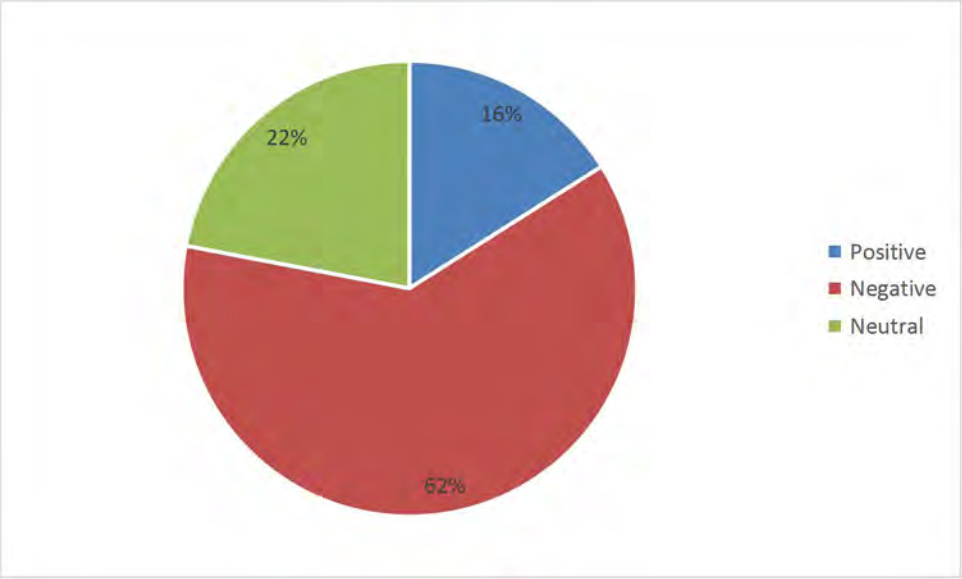

Figure 4. Respondent's attitude towards wild animal conservation.

4.6. Controlling methods Practiced by local people to protect crop raiding wild- animals

Farmers utilized various methods to keep their farm from crop raiding wild- animals. Most respondents from 4 different villages 97(63%) reported guarding as a very effective method in all villages followed by deterrent (fear provoking stimuli) 31(20%) used deterrent techniques in study area where as, 22(14%) of respondent used physical barrier methods however, using chemicals repellent was not well known in the area only 4(3%) this is because of the availability of chemicals stimulus .By using ANOVA to analyze the data There was significant difference ($F= 6.579$ $p< 0.05$) between guarding and other controlling method to minimizing crop damage around the park.Sillero-Zubiri and Switzer (2001), reported that guarding, chasing scarecrows, plastic flags,use of secant,fence, hunting,trapping,and poisoning are some term prevention methods of crop damage. The same was true in the study area farmers used guarding (chasing, watching eye and dogs) deterrents or fear provoking stimulus (visual scarecrows, lighting fire and distress noise) physical barrier (fence and wall) chemical repellents (chilies and dung or urines of different animals) to reduce crop damage. Hill (2000) stated that deterrents were likely to be more effective against pest. This was also true in the study area, however the deterrent techniques are temporary, because animal soon learn and ignore the threat (Bauer, 2003). The same condition was observed in the study area.

Table 11.Methods of protecting crop raiding wild-animals around CCNP

Types of crop protection	Respondents response		
	Frequency	Percent	Rank
Guarding	97	63	1
Deterrent	31	20	2
Physical barrier	22	14	3
Chemicals	4	3	4

4.7. Respondents response about the existence of strategies practiced by CCNP authority to mitigate the issue of HWC.

The findings in Table 11 show that CCNP have put poor measures to against the effects of human-wildlife conflict. All of the respondents were noted that CCNP authority has not developed compensation scheme and lethal control method. Almost (75%) of the respondents said the CCNP authority were not tried to create educational awareness for the local people about the importance of large wild animals, (70%) of the respondents noted no fence provided by the park managers .and only (10%) of the respondents, noted the park manager provide guarding. Park or protected area can be a powerful tool for conservation of wildlife. Yet the full impact of these schemes requires a good understanding of their impact on local people livelihoods. The result indicates the CCNP authority does not put meaningful strategies to mitigate the problem of HWC. So it is better to compensate the wild animal induced damage and increasing the awareness of the local people aids in prolonged conservation of wildlife.

Table 12.Respondents response on the existence of CCNP strategies in mitigating human Wildlife conflict

Mitigation Strategies used by CCNP authority	Respondents response					
	Strongly Disagree	Disagree	Uncertain	Strongly agree	Agree	Total
Education/awareness	52%	13%	10%	12%	13%	100%
Compensation	100%	0%	0%	0%	0%	100%
Fencing	65%	5%	10%	5%	15%	100%
Lethal control program	100%	0%	0%	0%	0%	100%
Guarding	47%	24%	19%	3%	7%	100%

Limitation of the study

This research would be more effective and valuables if the research did not faced any obstacle, but the research encountered the following constraints.

- Lack of sufficient available and easily accessible material.
- Lack of sufficient time to conduct the research.

5. CONCLUSIONS AND RECOMMENDATION

5.1. Conclusion

The present study investigated the impact of human wildlife conflict in Chebera Churchura national park south eastern Ethiopia. Peoples perceived crop damage by wild animals as a great hindrance to their livelihoods.

The cause of human-wild animal conflict was wild animal visitation to the farmland, destruction of crop and farm-land proximity to the park. Crop raiders take a lion share for the occurrence of human wild life conflict where Anubis baboon, vervet monkey wild pig, common wart hog, Cape buffalo, Hippopotamus, African elephant and porcupine was most commonly reported crop raiders.

Maize was the highest vulnerable crop to be damaged next to teff and banana. Anubis baboon, vervet monkey and wild pigs were the notorious pest in the study area.

The key crop raiding protection method in the study area was guarding, farmers also use fence and deterrent techniques to defend crop raiders from their crop. During guarding the aim was to kill the animals using stone or other harmful instruments. This indicated that there is an immediate need for a sweeping wildlife conservation education program to educate farmers living around the CCNP about the purpose and benefits of wildlife conservation, the cause of human wildlife conflict and method for reducing various forms of conflict.

The park authorities should improve the measure to against the effect of human- wildlife conflict and the farmers need to be take responsibilities for protecting their own crops which requires assisting them to develop locally appropriate schemes to successfully reduce crop loss.

5.2 Recommendations

The impacts of human wildlife conflict were negative and impacts negatively on both human and wildlife as highlighted in the paper. It was also a serious obstacle to the conservation of the abundant wildlife species around Chebera Churchura National park. From the result of this study the following recommendations were made to reduce the human wildlife conflict in the area.

- Farmers should cooperatively keep their farm against crop raiders to minimize crop loss by using most effective method in an area.
- Farmers changing their means of farming to cash crops like coffee and chat to reduce the challenge.
- The park authority should provide compensation for wildlife induced damage around the park.
- Further investigation must be conducted to identify alternative crops that can be rejected by crop raiders in the area
- The concerning body should work hard to increase the awareness of the local people about the importance of wildlife conservation.
- The park authority should provide fence or physical barriers that used to protect crops, peoples and livestock from threat.
- Farmers changing their means of farming to cash crops like coffee and chat to reduce the challenges.

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APPENDICIES

Questioners to be filled by people living around Chebera Churchura National Park in South West Ethiopia.

The main purpose of this questionnaire is to gather relevant information about the conflict between human and wildlife around Chebera Churchura National Park and to find out some solution to reduce the conflict

The response you provide will have a constructive and paramount important for the successful accomplishment of this study so, you are kindly requested to give your genuine response.

A. Questionnaire

Part one: - Respondents Demographic information

For close ended questions circle the letter of your answer and for open-ended questions give precise answers.

Village_____

Sex_____

Age_____

Educational background A) Unable to read and write B) 1-4 grade

C) 5-8 grade D) 9-10 grade E) others

Task of the respondents A) Farmer B) Students C) Merchant

D) Craft maker E) Civil servant F) Other

Part two: - Causes of human wildlife conflict

1. Farmland state A) Private farmland B) Family farmland C) No farm land
2. In your opinion do you feel is there any competition other natural resource between human wildlife around the CCNP. A) Yes B) No
3. Do you encounter any conflicts with wildlife?

A) Yes B) No

4. If yes, which one?

A) Crop loss B) Threat to livestock

C. Threat to human D) Others_____

Part three: - Respondents knowledge and practice about human wild herbivores conflict

1. Are there crop raiding wild animals in your surrounding

A) Yes B) No

2. If your answer is yes for the above question 1 which wild animals are more responsible for crop damage?

A) Anubis baboon B) Colobus guereza C) Wild pig D) Cape buffalo

E) Common warthog F) Hippopotamus G) Vervet monkey H) Birds

I) Porcupine J) Antelope

3. Ranks the common crop raiding wild animals that you mentioned in the question

Number 2 based on the severity of crop damage they cause?

A) 1st_____

B) 2nd_____

C) 3rd_____

D) 4th_____

E) 5th _____

4. Are you cultivate crop in your farmland?

A) Yes B) No

5. What type of crops you grow in your farmland 2015/2016?

A) Maize B) Teff C) Casaba D) Potato E) Wheat

F) Wheat G) Banana H) Sorghum I) Others_____

6. Rank the common crop damaged by wild animals in question 5 according to the severity of damage? _____

_____

_____

7. What do you feel on the population of crop raiding wild animal in your surrounding in the last three years?

A) Increasing B) Decreasing C) Unknown

8. What looks crop damage by wild animals in the last three years?

A) Increasing B) Decreasing C) Unknown

Part four: - Impact of human-wild animal conflict.

9. Which problem mainly faced due to crop damage?

A) Food shortage B) Low income C) Guarding related problems

10. What you suggest to reduce the effect of crop damage by wild animals?

A_____

B_____

C _____

D _____

E_____

11. What problems can be caused by crop raiders other than crop damage?

_____

_____

_____

12. What problems can be faced persons who permanently guarding their crops?

_____

_____

13. Attitudes of respondents towards wild animal's conservation?

A) Positive B) Negative C) Neutral

14. HWC mitigation strategies used by CCNP authorities.

Mitigation strategies	Strongly Disagree	Disagree	Uncertain	Agree strongly	Agree
Educational awareness					
Compensation					
Fencing					
Lethal control program					
Guarding					