



WOLKITE UNIVERSITY
COLLEGE OF AGRICULTURE AND NATURAL RESOURCE
DEPARTMENT OF WILDLIFE AND ECOTOURISM MANAGEMENT

Human wildlife Conflict in Choke Mountain, East Gojjam, Ethiopia

Senior Research (Course code: WETM 3164) Submitted to Department of wildlife and Ecotourism Management, College of Agriculture and Natural Resource, Wolkite University. Senior Project for the Partial Fulfillment of the Completion of BSc degree in wildlife and Ecotourism Management

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DECLARATION

The researcher conforms that the study in entitled “Human wildlife Conflict in Choke Mountain, East Gojjam, Ethiopia” is my original work and is being submitted to Department of Wildlife and Ecotourism Management, College of Agriculture and Natural Resource, Wolkite University in partial fulfillment for the award of BA degree in Wild life and Ecotourism Management. This report has not been submitted earlier to this and other institution.

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ABBREVIATION AND ACRONYMS

CWRDD	Choke Watershed Research and Development Directorate
ENMS	Ethiopian National Meteorology Service
FAO	Food and Agricultural of the United Nations
HWC	Human Wildlife Conflict
MASL	Meter above sea level

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ABSTRACT

Human-wildlife conflict is widely known situation where people and wildlife share common resource. This study was conducted to investigate the perceived impact human-wildlife conflict in the Choke Mountain, East Gojjam, Ethiopia. Purposively 50 respondents select in four Kebeles was selected namely; Shewa kidanemihret, Awurare, Abegera and Abazazh-veybeyiny based on the presence of high Human wildlife conflict. The data was collect by using both primary and secondary data collection. The primary data was gathering by the way of questionnaire and personal observation. Secondary data also was collect through available sources such as books, journal, staff workers and website. The main causes of Human wildlife conflict were expansion of agricultural activities, over grazing, deforestation, human settlement and demand for firewood collection. There are many impacts of human wild animal conflict in the study area. Such as: crop destruction, habitat fragmentation, killing of domestic animals and also killing of wild animals. Majority of respondents reported the existence of HWC manifested through both crop damage and livestock predation. Anubis baboon, Grivet monkey and porcupine were mentioned as major crop raiders in the study area. 50% of respondents reported that the most prominent sheep predation was caused by common jackal. There were respondents using traditional methods in which about most of them used guarding and some of them used smoking which was the highest and lowest method used respectively. Generally, based on the finding of this study, recommended Stakeholders to reduce habitat disturbance, Livestock grazing and other human activities, relocate agricultural activities out of wild animal ranges.

Keywords: human wild animal conflict, Crop raiding, Choke Mountain

1. INTRODUCTION

1.1 Background

Human-wildlife conflict is a well-known phenomenon throughout sub-Saharan Africa. It can result in negative impact on the livelihoods of local people or their resources, and/or the status of wild animal populations or their habitat and has existed for as long as humans and wild animals have shared the same landscapes and resources (Lamarque, *et al.*, 2009). Human wildlife conflict (HWC) exists in one form or another all over the world as wildlife requirements encroach on those of human populations and involve several animal species (Lamarque, *et al.*, 2009). HWC is becoming one of the most important Causes to the survival of many wildlife species and is an increasingly significant obstacle to the conservation of wildlife (Madden, 2008). It is a serious issue in Africa and other developing areas of the world where rapidly growing human populations and expanding settlements are reducing the areas left for wildlife habitat and increasing the interactions between humans and animals (Mwamidi, Nunow and Mwasi, 2012).

The transformation of global landscapes from predominantly wild to anthropogenic over the last centuries has created competition between humans and wild animal for space and other resources and it reached on unprecedented levels (Kate, 2012). As wildlife habitat becomes more and more fragmented and wildlife gets confined into smaller pockets of suitable habitat, humans and wild animals are increasingly coming into contact and in conflict with each other (Madden, 2008; Lamarque, *et al.*, 2009). Crop damage and livestock predation by wild animal are major source of economic losses (Dickman, Macdonald and Macdonald, 2011). Depletion of food supply in the wild forces wild animal to switch to crops and livestock as their food sources (Kolowski and Holekamp, 2006). Human population growth and associated increase in rates of resource use, habitat modification and fragmentation is forcing wild animal to live in increasing proximity to humans (Blair, 2008). The highest intensity of conflicts tends to occur where humans live adjacent to protected areas (Conforti and Azevedo, 2003). When humans live adjacent to larger wild animal habitats and increasingly altered their habitat, conflict between human and wild animal may occur (Michalski, *et al.*, 2006). It occurs when growing human populations overlap with established wild animal territory, creating reduction of resources or life to some people and/or wild animals. The conflict takes many forms ranging from loss of life or injury to humans, and animals both wild and

domesticated, to competition for scarce resources to loss and degradation of habitat. This study tries to highlight wildlife species that are responsible for crop raiding and livestock depredation in Choke Mountain.

1.2 Statement of the problem

There are many human wildlife conflicts in our country as well as in Choke Mountain which needs solutions, such as: deforestation, agricultural expansion, collection of fire wood, human settlement and overgrazing. Local communities do not benefit from wildlife resources and alienated from wildlife related economic enterprises such as the lucrative tourism industry, when local communities feel that both governments and conservation stakeholder value wildlife more than for their aspirations relation and opposition to conservation initiatives can be swift and uncompromising. The factors driving human wild animal conflict at the local level are, however, shaped in turn by numerous other factors, including laws and policies. In many cases, legal and policy measures particularly those involving land use planning and wild animal management contributes to this growing problem.

1.3 Significance of the study

The significance of the study will be a source of idea or information for the current human wildlife conflict in Choke Mountain. Able to give baseline information for local community and researchers and to maximize the understanding of people toward the wild animal conflict. To plan appropriate solution for the existing human wild animal conflict, and indicates future researchers for those who would like to conduct researches on Human wild animal conflict. Moreover, the data may be used as secondary data for researchers who working in the study area. It is also used to assess the causes of human wild animal conflicts in the study site.

1.4 Research questions

- What is the main cause of human wildlife conflict in Choke Mountain area?
- What are the animal species mostly involved in human wildlife conflict?
- What are the impacts of human wildlife conflict in Choke Mountain forest?
- What are the mitigation measurements of human wildlife conflict in Choke Mountain forest?

1.5 Objectives

1.5.1 General objective

- To assess cause and impacts of human wildlife conflict in Choke Mountain, East Gojjam, Ethiopia.

1.5.2 Specific objectives

- To assess main causes of human wildlife conflict in Choke Mountain forest
- To identify impacts of human wild animal conflict in Choke Mountain forest
- To identify wild animals involved in human wildlife conflict in Choke Mountain forest
- To identify possible mitigation measures of human wild animal conflict in Choke Mountain forest

1.6 Scope of study

In this study biodiversity of Choke mountain forest and other adjacent geographical areas were not included. Moreover, the study was limited only about Human wild animal conflict found in Choke Mountain.

2. LITERATURE REVIEW

2.1. Human wildlife conflict

Human wildlife conflict has been in existence for as long as humans have existed and wild animals and people have shared the same land escapes and resources (Blair, 2008). Human wildlife conflict or negative interaction between people and wildlife has recently become one of the fundamental aspect of wildlife management as it represent the most wide spread and complex challenge currently being faced by conservationists around the world. It arises mainly because of the loss, degradation and fragmentation of habitats through human activity such as logging, animal husbandry, agricultural explanation and developmental projects (Fernando, *et al.*, 2005).

Human wildlife Conflict is increasing across Africa. As human population and demands for land increase throughout the continent, human wildlife conflict will continue to increase (Browne and Jonker, 2008). Human wildlife conflict has been the cause of serious damage to both humans and wild animals for years (Raini, 2009). It occurs as a result of occurrence of both parties in close proximity. The conflict usually starts when wild animals consume resources meant for human consumption; crops by herbivores and livestock by carnivores.

2.2. Impacts of human wildlife conflict

Human wildlife conflict is a growing problem in today's crowded world, and can have significant impacts on human population (Acharya, *et al.*, 2017). as human population and the extent of transformation increase the probability of competition for resource between human being and wildlife also increase (Dickman, 2008). As the need and behavior of wildlife and human being become close to each other, it impact negatively the goals of human and finally create conflict between them. Wildlife can have very significant impacts up on human directly and indirectly those impacts range from clear cut economic hard ship to less tangible effects such as increased opportunity costs and decreased quality of life. Living along side of wildlife can incur variety of additional costs aside from the direct impact of depredation (Distefano, 2010).

Human and wild animal have been in conflict because farming crops generally offer a rich food source for wildlife as well as for people. Large wild herbivores compete for fallow resources with livestock and can act as reservoirs of livestock diseases. As a result, humans have extirpated many native animal species from agricultural areas, either directly or indirectly through

modifications in habitat availability or structure resulting from land use changes. Wildlife damage to agricultural crops is a serious concern affecting much of the world today. (O'Connell-Rodwell, *et al.*, 2000). Primates are one of the most frequently cited crop pests (Hill, 2000). So primates and humans are always in potential conflict over crops. The significant problem relates to primates that are provisioned by people, when people seek contact with monkeys. The monkeys develop a taste for human foods, lose their fear of humans and then become practical and aggressive in looking for human foods. This conflict is particularly interesting in that it arises from a positive desire to contact monkeys and then people discover that the contact poses risks from bites, theft of non-provisioned food or more general health issues such as exposure to simian viruses (Else, 1991).

2.3. Causes of human wildlife conflict

As a population expands in to wild animals, habitats, natural wildlife areas are displaced. Mitigation in availability of natural food source lead to wild animals seeking alternate sources (Kansky and Knight, 2014). New resources created on human draw wildlife resulting to human wildlife conflict (Muruthi, 2005). The population rate of human and wildlife increase with overlaps in geographical areas using increasing their interaction thus resulting to increase physical conflict. Existence of human offers opportunity for wildlife in the form of food and habitat interference and destructive threat for both human and wildlife. Competition for food source also occurs when human and endeavors to reap natural resources such as forest, grassland pasture and wild animals (Mulholland and Eagles, 2002). When human and livestock move in to a conserved area for wildlife to access the resource that they need and lack in their surrounding Example water and pasture that brings about human wildlife conflict. When wild animals move in their protected area that is their habitats in to the community land either to feed on crops or their migration to their feeding and reproducing areas, during their movements they can lead to injure or kill people, eat or destroy crops on the farm, kill or injure livestock, transmit diseases or disease causing parasites to livestock, utilize the grazing resource meant for community livestock (Kissui, 2013).

2.4. Human wildlife conflict Resolution

Human wildlife conflict can be managed through a variety of approaches. Prevention strategies endeavor to avoid the conflict occurring in the first place and take action towards

addressing its root causes (Hill, Osborn and Plumptre, 2002). Protection strategies are implemented when the conflict is certain to happen or has already occurred. Mitigation strategies attempt to reduce the level of impact and lessen the problem. The main difference between the options is the moment at which the measure is implemented. By definition, management techniques are only cost-effective if the cost of implementing the technique is less than the value of the damage, taking into account the fact that a short period of active management may have a continued effect, by instating longer-term protection of crops or herds (FAO, 2010). The various management possibilities are presented according to the characteristics of conflict whether they relate to humans, production, animals and the environment, rather than according to their ability to prevent or mitigate damage (Lamarque, et al., 2009).

According to (Hill, Osborn and Plumptre, 2002) conflict resolution/management methods have the following possible goals: reducing the amount of crop losses to wildlife; improving local people's attitudes and perceptions towards protected area and its wildlife; helping affected farmers to improve agricultural production; increasing the amount of crops being harvested locally. Through improved local yields and reducing levels of poaching. Once the individual goals have been established and the availability of the necessary resources determined, then discussion with the communities can be important. Communities living around forest areas are different from those in other areas as they often receive a disproportionate amount of interest from the conservation and development contributor. This can influence people's expectations with respect to who should take responsibility for developing, implementing and/or maintaining any control scheme. Those wise it is very important that farmers be involved in the process of developing new solutions from the beginning (Treves, 2007). Not only does this foster a sense of commitment and involvement amongst them, but it is also vital that they be involved from the beginning. Because they understand how the situation affects them and what kinds of intervention are likely to be acceptable and feasible within the local culture, providing there is adequate representation from the different types of stakeholder involved (Parkhurst, 2006).

3. MATERIAL AND METHODS

3.1 Description of the study area

Choke Mountain is found in East Gojjam, Central Ethiopia. The mountain range is located on a plateau that rises from a block of meadows and valleys. Choke Mountain and its environs have different topographical features ranging from 2800 to 4088masl. The central peak is located at 10°42' N and 37°50' E. the whole mountain area extends over 10°41' to 10°44' N and 37°50' to 37°53' E and covers an area of about 581 km² (Belay Benjamin and Mutlu, 2013). Its topography is sloppy and mountainous nature, which is sensitive to climatic hazards especially with rainfall variability and intensity. Mean monthly temperature of the area were 17.6°C. In the last ten years the average annual rainfall was 1377.6 mm (ENMSA, 2014). The Choke Mountains range is harboring a high diversity of plant and animal life. There are 49 bird species are recorded. Furthermore, 16 species of large mammals have been recorded to occur in the area. The major natural habitats in the area are moist moorland, sparsely covered with Giant Lobelia (*Lobelia rhynchopetalum*), lady's mantle (*Alchemilla humana*), Guassa grass (*Festuca spp.*), Red hot poker (*Kniphofia spp.*), St. John's wort (*Hypericum revolutum*), *Helichrysum spp.*, *Arundinaria alpina*, *Erica arborea*, *Euryops pinifolius*, *Hygenia spp.*, *Cordia spp.*, *Ficus spp.*, *Echinopis spp.*, *Acanthus sennii*, *Erythrina brucei*, and others (CWRDD, 2014). The highest peak of the area is found in Senan Woreda presented in Figure 1 below.

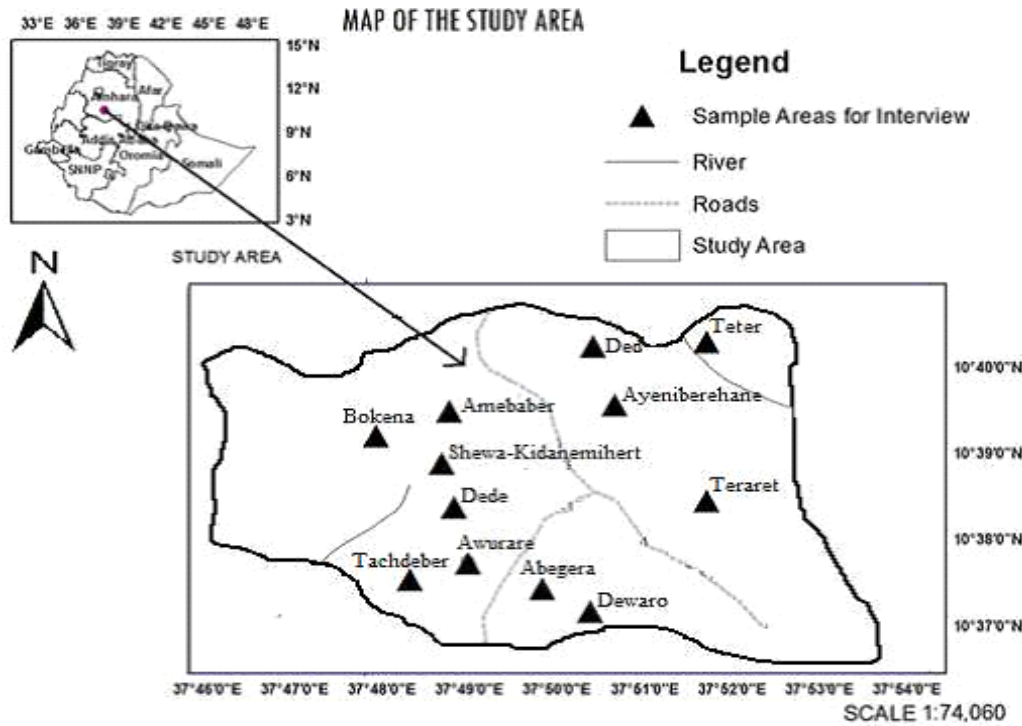


Figure 1 Map of the study area

3.2 Data Collection Methods

Data was collected through survey using questionnaires, interview and personal observation. Secondary data was used from staff workers, internet, magazine, website, published and unpublished data and other different books.

3.3 Sampling design

The study was carried out through purposive sampling technique by select respondents from the local people and from the target population, purposive sampling conducted through purposive select the target population to get more accurate data for our research study. The researcher was study human wildlife conflict in Choke Mountain. 50 respondents from the four Kebeles are selected purposively. Namely: Shewa kidanemihret, Awurara, Abegera and Abazazh-
weybeyiny. Those Kebeles have total households of 2000. From these house holds 12 individuals selected from each Kebeles based on adjacent frequently contact or closely related to the mountain

and 2 persons from Senan tourism office. 50 respondents was taken as representative and each members of the selected sample was interviewed.

3.4 Data analysis

Both qualitative and quantitative data was analyzed using survey, questionnaire, interview and filed observation. The data was analyzed by using Frequency and descriptive statistics such as mean percentages and the data were presented on tables, picture, charts, percentage and other diagram in order to analyses more information about our research study.

4. RESULT AND DISCUSSION

4.1. Demographic Characteristics of respondents

Demographic characteristics respondents of the study were presented in table 1 below. Different category types were used such as: sex, age and education status. Total of 50 respondents were participated to collect data, based on sex 35 were male and the rest were females. According to education status illiterate were higher than literate (56 %) and (40 %) respectively. According to age category 20-35 were (50 %), 36-50 were (36 %) and > 51 were (14 %) identified

Table 1 **Distribution of respondent demographic characteristic (n=50)**

Demographic character	Category	No of respondents	Percent %
Sex	Male	35	70
	Female	15	30
Age	20-35	25	50
	36-50	18	36
	> 51	7	14
Education status	Illiterate	28 (M=20/71%, F= 8/29%)	56
	Literate	22 (M=10/40%, F=12/60%)	44
		Primary school (8)	36
		Secondary school (12)	55
		Diploma (2) person from Senan woreda tourism office)	9

NB: M=Male, F= Female

4. 2. Causes of human-wild animal conflicts

According to the respondent during data collection the main cause have been mentioned in table 2 below. The main causes mentioned as human wild animal conflict were expansion of Agricultural activities, grazing livestock, Deforestation, demand for fire wood collection and Human settlement. Agricultural activities (37%) were more frequently mentioned while Human settlement (10%) was the least. This result was agreement with find out the causes that made wild animals forced to crop raiding and livestock depredation which create conflict between farmers

and wild animals, variables such as deforestation, distance of farm land from residence, grazing livestock and farm land expansion to forest area were assessed using interview as similarly used by (Kivai, 2010).

Table 2 Causes of Human wild animal conflict around the study area (n=48)

Factor	Frequency	Percent %
Agricultural expansion	18	37
Grazing livestock	12	25
Deforestation	6	13
Human settlement	5	10
Fire wood collection	7	15
Total	48	100

Agriculture Expansion, According to the respondents Agriculture expansion describes the growth of agricultural land. It is foreseen that most nonagricultural terrestrial and aquatic ecosystem of the mountain was affected adversely. The intensified food and biofuel production was particularly affect tropical region. Most modern agriculture relies on intensive methods. Further expansion of the predominant farming types that rest on a small number highly productive crops has led to a significant loss of biodiversity on Choke Mountain.

Grazing livestock, According to the respondents over grazing occurs when plants are exposed to intensive grazing for extended periods of time, or without sufficient recovery periods. It can be caused by either livestock poorly managed agricultural application, game reserves, or nature reserves. It can also cause by immobile, travel restricted population of native and non-native wild animals. It reduces the usefulness, productivity and biodiversity of the land and is one cause of desertification and erosion. The farmers in the study area use the forest for different purposes by destructing the habitat of wildlife animals. This practice forces wild animals to engage by in crop damage and distraction of other valuable material. Similar studies was worked, (Melese, 2006) in Bale and around the Semen Mountains National Park the people destroying forest for the purpose of fire wood, cattle grazing and other benefit engages primate to raid crop.

Fire wood collection, based on the respondents, Firewood is any wooden material that is gathered and used for fuel. Generally, firewood is not highly processed and is in some sort of

recognizable log or branch form, compared to other forms of wood fuel like pellets or chips. Those who lived closer to the mountain collected firewood more frequently than those who lived far from the mountain. Similar results were also observed on the study conducted in Guassa area: peasant associations closer to the area used firewood more frequently than those living further away (Zealealem, 2001).

Human settlement, According to the respondent's Human settlement is a concept that integrates and is composed of physical infrastructure providing shelter and a mosaic of built and natural spaces for economic and social activities. it is sites of service provision promoting economic exchange, education, health, culture, recreation and nutrition.

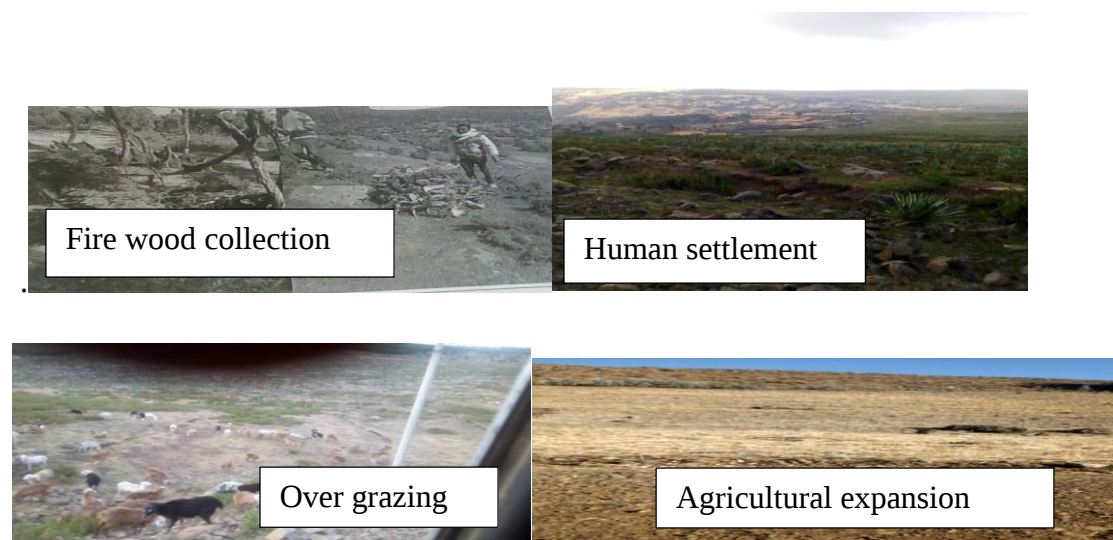


Figure 2 Cause of human wildlife conflict (photo by Yitayish 2019).

4.3. Impacts of HWC

It is recognized that humans have profoundly impacted wild animal and the environment in many ways, through habitat loss, pollution, overexploitation, and climate change. The incidents of Human- wild animal conflict highlight forms as the recurrent around that area are crop destruction, habitat fragmentation, killing of domestic animals and also killing of wild animals.

Crop Destruction: Showed that not all crops were equally affected by crop raiders. During the present study the respondents claimed that Barley was the most vulnerable crop to raiders, Potato, whereas the respondent reported that Legume and Wheat crop are damaged by wild animals

(table 3 below). Barley (60%) was most vulnerable mentioned while bean (16%) was the least. The result was agreed with finding of who reported that Maize (ripe and dried) was the most frequently eaten crop by crop raiding in West Africa. The predators on small ruminant and chickens during the present study were Olive Baboons. This result the same as People lose their crops, property and sometimes their lives (Patil, 2011) to wild animals.

Table 3 Rank of crops in the order of destruction by crop raider (N=50)

Crop	Frequency	Percent %	Rank
Barley	30	60	1
Potato	12	24	2
Bean	8	16	3

Habitat fragmentation: - Habitat fragmentation describes the emergence of discontinuities fragmentation in an organism's preferred, environment causing population fragmentation and ecosystem decay. Causes of habitat fragmentation include geological processes that slowly alter the layout of the physical environment and human activity such as land conversation, which can alter the environment much faster and causes the extinction of many species fragmentation not only causes loss of the amount of habitat, but by creating small, isolated patches it also changes the properties of the remaining habitat.

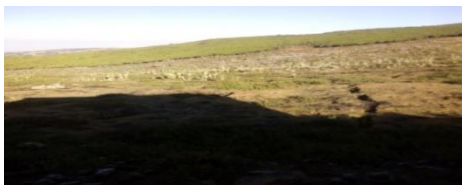


Figure 3 represents habitat fragmentation (photo by Yitayish 2019)

4.4. Wild animal involve in human wildlife conflict

The respondents reported that there was the problem of crop damage by wild animal mentioned in Figure 4 below; problem of wild animal causes crop damage. Based on the respondents, Olive Baboon, Grivet Monkey and porcupine were causes crop raiding in different ranks. Farmer ranked crop raiding wild animal such as: - Olive baboon was commonly reported crop raiders which cause much damage and ranked first. Respondents put Grivet monkey as second

crop raiders in the study area. Porcupine was the third crop rider. The result agrees with finding of (Kate, 2012.) who reported that Baboons were ranked number one crop raiders in Uganda.

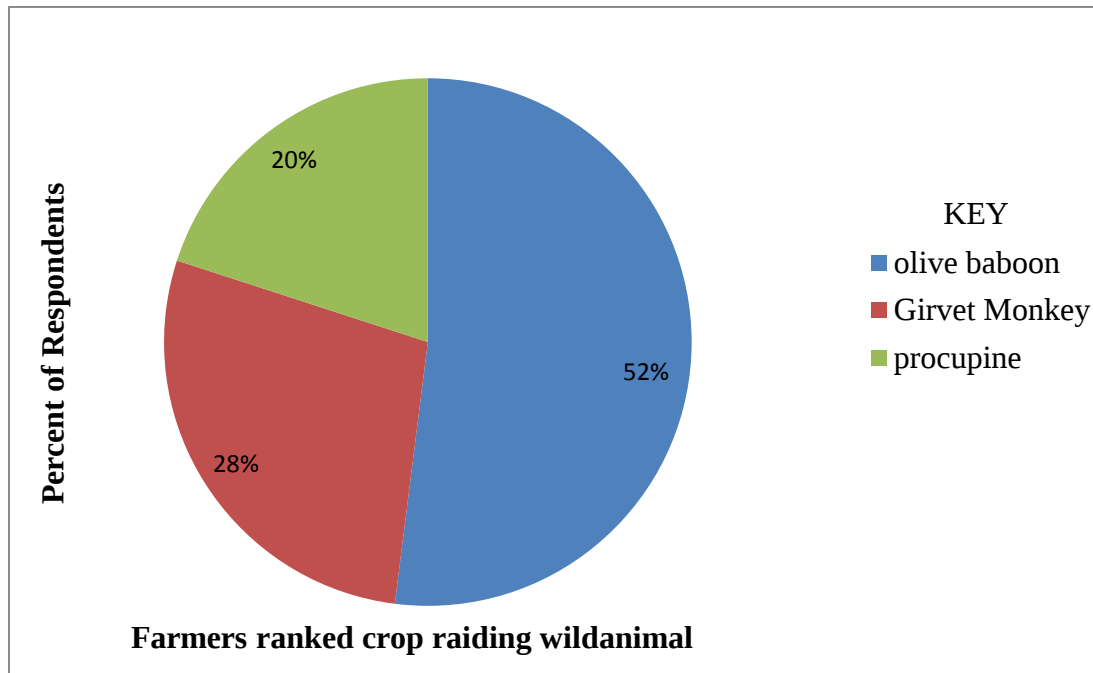


Figure 4 Farmers ranked crop raiding wild animal

According to respondents reported that livestock depredation was one of the problems of human wildlife conflict and identified three wild animals which depredated the livestock, namely; common jackal, leopard and spotted hyena in the study area mentioned in table 4 below. Respondents ranked wild animal which cause livestock predation from the one which causing most damage to the one that cause the least damage. (50%) of the respondents reported that Common jackal was the most commonly reported predator and killed more livestock and ranked first. (30%) of respondents put spotted hyena was the second livestock damager and also (20%) of respondents leopard was the third livestock damager.

Table 4: farmers ranked livestock deprecating wild animal

Wild animal	Scientific name	Respondents	Percentage (%)	Rank
Common jackal	<i>Canis aureus</i>	25	50	1
Spotted hyena	<i>Crocula crocula</i>	15	30	2
Leopard	<i>Banthera pardus</i>	10	20	3

4.5. Possible mitigation measurement of human wild animal conflict

The respondents used to different methods have been mentioned in Figure 5 below, to defend crop raider from their crop include guarding, chasing, live fencing, scarecrow and smoking. Using the different traditional methods in which most of the respondents were used guarding their crop whereas some were used smoking to repeal the crop raiders from their crops in the night time which was the highest and the lowest respectively. Respondents reported that as they guarded their crops throughout crop growing season. Chasing and fencing were also the second and the third important methods respectively. Smoking and scarecrow was also used to as supplementary. This result was the same with the finding of (Sillero-Zubiri and Switzer 2001) in Africa, (Eniang, et al, 2011) in Nigeria; Kate (2012) in Zimbabwe who founds that guarding and chasing away of animals was ranked first and second in protecting crop raiders from crops.

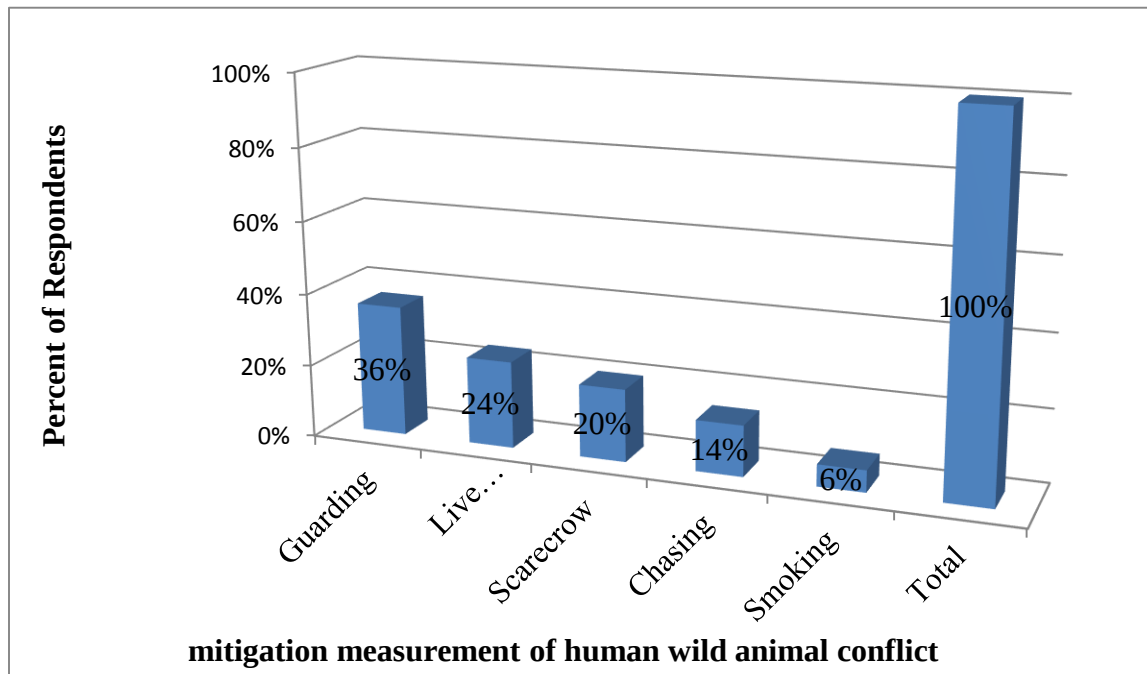


Figure 5 Possible mitigation measurement of human wild animal conflict

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

This study was conducted the presence of human wildlife conflict in choke mountain, in east Gojjam zone, Amhara, Ethiopia. The causes of human wildlife conflict were agricultural expansion, grazing livestock, human settlement and fire wood collection. The community living in Choke Mountain utilized AbaJemie forest as grazing land for their livestock and firewood collection. All of the respondents had no private grazing land. Those respondents that were living closer to the forest efficiently use the resources throughout the year. Most respondents from Awurare, Abazazh-weybeyiny, Abegera and ShiwaKidanemihret utilized the forest. Thus, Awurare utilized the AbaJemie forest as grazing land mostly. The respondents used different types of plant species and cow dung as firewood. The respondents were identified six wild animals namely; Olive Baboon, Grivet Monkey, porcupine and spotted hyena, common jackal and leopard as problematic that caused crop damage and livestock predation respectively. Based on the respondents, Olive baboon, Grivet Monkey and porcupine caused crop raiding in different degrees. Olive baboon was the most commonly reported crop pest which cause much damage and ranked first. Three major types of field crops were grown namely potato, barley and bean. Porcupine mainly destroyed potato near maturation stage. Olive baboon and Grivet Monkey were causing damage on crops in all stages from the time of germination to the time of harvest. Most (60%) of the respondents claimed that potato was the most vulnerable crop to crop raiders followed by barley (24%). Whereas (16%) of the respondents reported that bean was the least vulnerable crop to damage caused by wildlife. Respondents ranked wildlife which cause livestock predation from the one which causing most damage to the one that cause the least damage. Most respondents reported that there was a strong conflict between local peoples and common jackal. Common jackal was the most commonly reported predator and killed more livestock and ranked first. The majority of respondents reported that trend of livestock predation by common jackal was increasing. Respondents reported that the impact of human wildlife conflict were livestock damage, Crop destruction and habitat fragmentation. The traditional methods used by Farmers to Defend Crop Raiders from crop were permanent guarding, fencing, scarecrow, chasing and smoking. From those methods permanent guarding was the most appropriate method.

5.2. Recommendation

In light of the results and conclusions, the following recommendations are suggested to minimize the problem of HWC:

- Farmers should sow uniform crop at uniform time alongside of their farm to take the advantage of uniformly keeping the farm to minimize the loss of crop to crop raiders.
- Making appropriate site selection for investment to reduce habitat disturbance. Livestock grazing and other human activities that degrade the natural habitats of wild animal should be strictly reduced by developing implementing rules and regulations.
- Stakeholders should work together to reduce human encroaching in wild animal habitats and relocate agricultural activities out of wild animal ranges.
- Local people should participate in the process of resolving the existing challenges in order to foster positive outlook towards wild animal.

Implementation of rural development should be designed to move the local people to the buffer zone to reduce human activities in habitats of wild animal and the movement of wild animal from their habitats to farming lands.

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7. APPENDICES

WOLKITE UNIVERSITY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF WILDLIFE AND ECOTOURISM MANAGEMENT

Part I: Personal Information

I am Yitayish Mersha graduate student at Wolkite University. Currently I am conducting a research study on Human wildlife conflict in Coke Mountain East Gojjam Zone, Ethiopia. For the partial fulfillment of the requirement for Degree of BSc in Wildlife and Ecotourism management. I require your help to spend some minutes of your time with us for interview. The purpose of this Interview is to gather information about the Human wildlife conflict in this area. I can assure you that any information that provide in this interview will be kept confidential. Your kind cooperation would be greatly appreciated and is great importance for the successful completion of this study. Thank you!!!

Appendix I: The survey questionnaire for formal interview Households survey on Human-wildlife conflicts in Choke Mountain East Gojjam, Ethiopia.

1. General information

Household code number _____ Name of interviewer _____ sign

_____ Date of interviewee day _____ month _____ year _____

1. Name of household head _____ Age _____

2. Sex 1) Male 2) Female

3. District _____

4. Keble's _____ village _____ GPS _____/agro-ecology _____

5. Level of education 1) illiterate 2) literate 3) 1-4 grade 4) 5-9 grade 6) grade 10 and above

6. What is the nature of your land security from wild animal damage? 1) secured 2) not secured 3)

7. How much is the distance of your cultivation land from forest edge? 1) Near 2) medium 3) far

8. What are your livelihood activities? (Multiple choices is possible)

- 1) Crop production
- 2) Livestock keeping
- 3) mixed Farming (Farming and livestock keeping)
- 4) Crop production and other income
- 5) Other (mention)

9. What type of crops you grow in your farm land? Put in order to know which one is the most?

1) Potato 2) barley 3) legume 4) wheat 5) others _____

10. Do wild animal cause damage to your crops? Yes/ No.

11. What is the cause for the happening of HWC in your area?

- a) Agriculture expansion
- b) Grazing livestock
- c) Fire wood collection
- d) House construction 5) other specify

12. Which wild animal are more responsible for crop damage?

- a) Olive Baboon
- b) Echidna
- c) Fox
- d) Ape
- e) Others

13. Which wild animal are more responsible for crop damage during day time on which crop?

1) Potato 3) legume

2) Barley 4) wheat 5) others

14. Which wildlife is more responsible for crop damage during night time on which crop types?

- 1) Potato 4) Wheat
- 2) Barley 5) others
- 3) Legume

15. Which type of crop is more damage by wild animal?

- 1) Potato 4) Wheat
- 2) Barley 5) No damage in general
- 3) Legume

16. Which type of crop is least damage by wild animal?

- 1) Potato 3) Legume
- 2) Barley 4) Wheat

17. What control measures have been taken to safeguard your crops from wild animal?

- 1) Guarding 4) Smoking
- 2) Fencing 5) Scarecrow
- 3) Chasing

18. Which of the techniques are most effective?

1.....

2.....

19. Which of the techniques are least effective?

1.....

2.....

3.....

20. Which Wild animal is the most damage in terms of livestock predation?

1..... 3.....

2..... 4.....

Appendix II. Lists informant interview (rural agricultural development office, District and better informed farmers)

1. Name _____ Date _____

2. Education status _____ your profession _____

3. How long have you stayed in the area? _____

4. Is there HWC around this area?

5. What are the major factors that cause Human wildlife conflict in the study area /district?

6. Why farmers are in your area face Human wildlife conflict?

7. What are the gaps between farmers and development actors in addressing Human wildlife conflict?

8. Do you have traditional method to reduce this conflict?