

Hamadryas Baboon (*Papio hamadryas hamadryas*) Conflict with Human in Community Forest in Gasera District of Bale Zone, Southeast Ethiopia

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Abstract: Hamadryas baboons occur in different parts of Ethiopia; hamadryas baboon conflict with human never been studied and determined in the study area. Farmers around this area facing a challenge due to Hamadryas baboon conflict with human. Therefore, this study was conducted to assess Hamadryas baboon (*Papio hamadryas hamadryas*) Conflict with human in Community forest in Gasera District of Bale Zone, Southeast Ethiopia. Materials used for this study was GPS to plot study area, camera for scan sampling, note pad, pen, pencil and flash was used to record data. Data was analyzed using descriptive statistical method as mean and percentage to analyze responses of the respondents on hamadryas baboon conflict with human, baboon was found in Wolda jebesa, Wote chimo and Burkitu respectively. Most of the respondents responded that there was conflict between human and hamadryas baboon due to crop and, livestock damage, overgrazing, plowing near the forest, and habitat clearance. Most of the respondents responded that training was not given on how to manage conflict so they negative attitude towards hamadryas baboon. To minimize this awareness should be given to local people about economic and ecological benefit of hamadryas baboon and how to manage conflict with hamadryas baboon.

Keywords: Conflict, Community Forest, Gasera, Hamadryas Baboon (*Papio Hamadryas Hamadryas*), Human

1. Introduction

1.1. Background of the Study

Hamadryas baboons (*Papio hamadryas hamadryas*) are often considered pests, there appears to be little information specifically on the hamadryas baboon as a pest species. Commodities that may be susceptible to this species would be fruit, nuts, cereals, grains, oilseeds, grain legumes and vegetables. The hamadryas baboon has not been reported as an environmental pest in any country and there are no established feral populations recorded in any other country or region worldwide [12].

Transformation of field and pastureland represents the main threat to the hamadryas baboon; its only natural predators are the striped hyena, spotted hyena and African leopard who are still living in its area of distribution. The conflict between hamadryas baboons and the local

community is increasing because new farmers have been involved in sedentary agriculture from nomadic pastoralists to improve their livelihood [15]. The farmers highly curse the baboons for raiding their crops [8].

Although, hamadryas baboons are least concern species, in Ethiopia there is hamadryas-human conflict because of habitat loss as well as deforestation for charcoal, over grazing, hunting and settlement in the park. The nomadic pastoralists living in the Park as well as in the proximal areas of the park kill and hunt the baboons because they raid commercial sugarcane plantations and other agricultural crops of the local farmers [11].

There is no research that is conducted on Hamadryas baboon in Gasera district. Farmers around this area facing a challenge due to crop raiding by Hamadryas baboon this creates human hamadryas baboon conflict to become intensive. Therefore, this study was aimed to investigate human-Hamadryas baboon conflict in community forest of in

Gasera district.

1.2. Statement of the Problems

Primate populations, like those of other organisms, face the challenge of coping with the dynamics of their habitats because habitats are continually changing and primates must adapt to changes in order to survive; failure to adapt dooms species to extinction [10].

Hamadryas baboon conflict with human was not studied in the study area. An increase in human-hamadryas baboon conflict leads economic loss of local people. Extent of damage caused by hamadryas baboon on crops and impact made by local people on hamadryas baboon was not studied. Family of local community waste their time on keeping their crops from crop raider. Local people have negative attitudes towards hamadryas baboon. This study was focused on Assessing Hamadryas baboon (*Papio hamadryas hamadryas*) conflict with human in community forest in Gasera district of Bale zone south east Ethiopia.

1.3. Significance of the Study

The will provide information on current Hamadryas baboon population size, distribution and their conflict with Human in the study area. This is important for proper action to be taken to conserve and manage Hamadryas baboon species and human- Hamadryas baboon conflict resolution.

The study provided information for government to strengthen conservation activity by local people in order to establish comfortable habitat for wild animal including Hamadryas baboon and insures wild species viability and sustainability. The study will stated the population size of Hamadryas baboon outside of the national park to some extent and can be an input for other study that will be carried on wild animal conservation. The study wills create an insight of the local community how to resolve and manage conflict with Hamadryas baboon.

1.4. Objective of the Study

1.4.1. General Objectives

The general objective of this study is Assessing Hmadryas baboon (*Papio hamadryas hamadryas*) Conflict with human in Community Forest in Gasera District of Bale Zone, Southeast Ethiopia.

1.4.2. Specific Objectives

1. To determine effects of Hamadryas baboon on crops, animals and properties of local community around the study area.
2. To identify the main causes of human-hamadryas baboon conflict in the study area.
3. To identify the attitude of local people towards Hamadryas baboon population in the study area.

1.5. Research Questions

1. What type of conflict is the community encounter by Hamadryas baboon and to what extent?
2. What are the main causes of Hamadyas baboon conflict with human in the study area
3. What are the underlying causes of the problem of Hamadryas baboon conflict in the study area?

2. Methodology

2.1. Description of Study Area

2.1.1. Geographic Location and Topography

Gasera Community forests are located along the southeast parts of Ethiopia. Three villages, Wote Cimo and Balo Aminya and Gasera 01 kebele of the district own the community forest. They name the forest as, youth and elders association of Wote Chimo, Burkitu of Gasera and Wolda Jebesa of Balo Aminya. It is located in Bale zone in Gasera special district, about 60km east of Robe town and 490 km southeast of Addis Ababa. The study area lies between the coordinates 7° 21'56. 7"E and 40° 11'04.2"N. The Wote chimo elders' association forest is bordered by Nake Nagawo from the west and, Wote Chimo keble from south and east, Zeyfata from north. Burkitu community forest is bordered by Gasera town from south and Balo madada from the north, Wote chimo from the west and Wolda gebesa from the east. Wolda Gebesa is bordered by, Balo Habebe from the north, Balo Aminya from south and east, Burkitu from the west. The elevation of study area is 2339m above the sea level. Gasera community forest is characterized by heterogeneous hilly terrain. Large portion of study area is valley floor, drained bottomland with different hills. The study area lies on the top edge of the Wabe river gorge. The high land is characterized by little flat and the low land is characterized by gentle slope. Totally, the community forest areas accounts for more than 234.674 hectare.

2.1.2. Climate

The Gasera community forest experiences distinct dry and wet season with long wet season from December to July and relatively short dry season from august to October. During the wet season, most of the time, the area is blanketed by thick white fog and clouds usually accompanied with rain. The average monthly rainfall and temperature for the study area over four years was obtained from the Ethiopian Meteorology Agency, Robe Field Station [3].

The region experiences a seasonal bimodal distribution of rainfall. Rainfall distribution for the region varies between average monthly minimum with in October, September and august respectively and maximum rainfall with in April, January, December, respectively while the rest months experiences moderate rainfall ranges from 135.4-288.8ml as mentioned in figure 2 bellow [3].

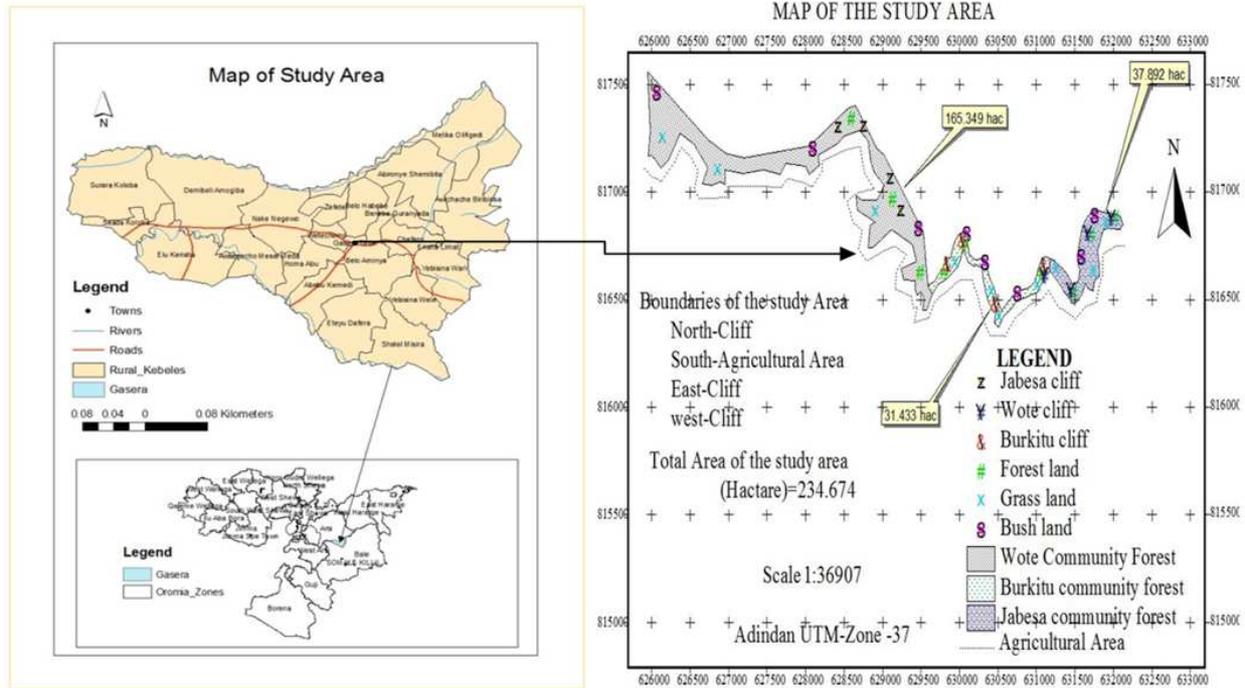


Figure 1. Map of the study area.

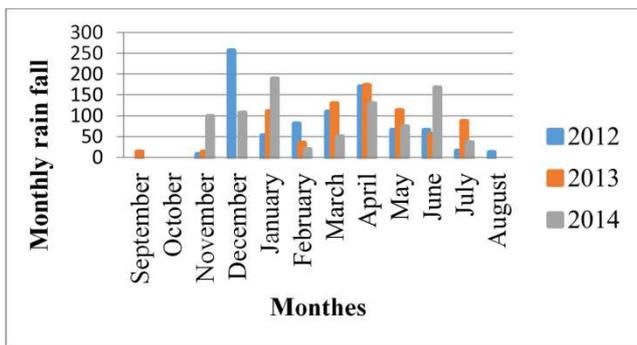


Figure 2. Gasera District average monthly rain fall of 2012-2014.

The temperature data of 2014 and 2015 indicates the maximum annual temperature of the area lies within 21.1°C-23.79°C and the minimum temperature of the area lies within 8.9°C -9.9°C. The lowest temperature was recorded in July and the highest temperature was recorded march as shown in the figure 3 below.

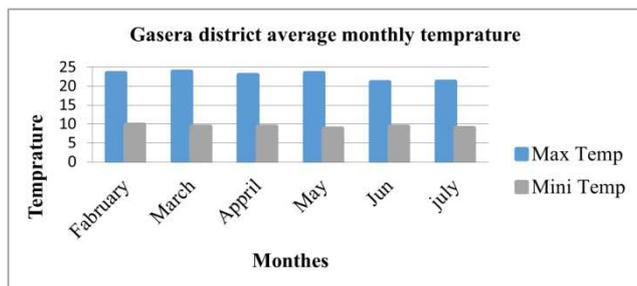


Figure 3. The maximum and minimum temperature of Gasera district in 2014 and 2015, Sources Ethiopian metrological agency Robe branch.

2.1.3. Common Vegetation and Fauna

The area is dominated by different tree, shrub and open grassland. *Olio euro pea* (Oleacea) *Balanites aegyptica* (Balanitaceae) *Rubus apetalus* (Rosaceae), *Acacia albida* were common vegetation while, Spotted hyena (*Crocuta crocuta*), Leopard (*Panthera pardus*) Hamadryas baboon (*Papio hamadryas hamadryas*), Warthog (*Phacochoerus africanus*), were common animal found in the study area.

2.1.4. Land Use and Human Settlement

Population of Gasera distinct as the demographic data of 2003 E.C indicates household 11,393, families 75,163 of this male 45,280 and female 41,276 total 86,556. Mixed agricultural practices are sole livelihood of the majority of the inhabitants around the area. The most of the people practices traditional agricultural system that combines primal and annual cultivation with livestock rearing. Shifting cultivation is common in southern parts of the study area. Permanent crops harvested in the area include cereals, fruit, inset, vegetables. Barley and wheat are the major stable crops on the highland side while banana, mango and sugar cane are mainly used for household subsistence in the lowland side.

2.2. Materials

During the survey, the researcher was used the following material for the investigation. These were GPS, camera for scan sampling, note pad and pen and pencil to record data during data collection and flash and Video camera.

2.3. Methods

2.3.1. Preliminary Study

The present research was conducted from February 2017

to October 2017. Preliminary survey was conducted for two weeks in February 2017 in selected study sites. The main purpose of this survey was to evaluate the questionnaire and to check whether it was applicable and suitable in the study area, to check the respondents understood the questionnaire. It also helps us to identify the boundaries of different habitat area and types in community forest, to decide the number of cliff and types of census method require to set and to have better understanding on the population size, distribution and status of human-hamadryas baboon conflict in and near the study area. Based on the preliminary survey results; the questionnaire was revised and developed as used by [16] and [4].

2.3.2. Selection of Samples and Sampling Design

The study area was selected purposefully as the area represents one of the highest cases in human wild life conflict, the abundance the forest resources. The population count area was selected based on the presence of hamadryas baboon sleeping cliff and food resource. Three Keble was selected based on their proximity to wards the forest edge. Based on the distance of their farmland from forest edge households were selected from each village for formal interviews. Following this household's sample frame was established by taking complete landholders list from their representative land administration office. Accordingly, there were 1340 (1072 male and 268 female) households in three-selected Keble around the study area. From each three Keble households having farmland and living near the study area was randomly selected for normal interviews.

Following this, the total sample size was determined using probability proportional to sample size-sapling technique [1].

$$n_0 = \frac{Z^2 * p(q)}{d^2} \rightarrow n_1 = \frac{n_0}{1 + n_0/N} = 125$$

Where;

n_0 = desired sample size Cochran's (1977) when population greater than 1000

n_1 = finite population correction factors (Cochran's formula, 1977) less than 1000

Z = standard normal deviation (1.96 for 95% confidence level)

P = 0.1 (proportion of population to be included in sample i.e. 10%)

q = is 1-p i.e. (0.9)

N = is total number of population

d = is degree of accuracy desired (0.05)

Based on Cochran (1977) population correction factors, a total of 125 sample household head were selected using simple random sampling techniques from the total population of 1340 (450 from Gasera and 460 from Balo aminya and 430 from Wote chimo). Allocations of the number of sample households to each Kebeles was proportional to the number of household head living in each selected Kebeles, accordingly 42 house hold from Gasera, 43 house hold from Balo aminya and 40 house hold from Wote chimo were selected for this study.

2.4. Data Collection

2.4.1. Questioner Survey

To collect information about human-hamadryas baboon conflict questioner survey, direct observation of crop damage caused Hamadryas baboon population is involved [17]. Questioner surveys /interview and focus group discussion have been employed to gather data about human Hamadryas baboon conflict. One hundred twenty five people were identified from three purposefully selected kebele. One hundred twenty five for semi-structured questions that was administered for selected households. The questionnaire was translated to Afan Oromo.

2.4.2. Focus Group Discussion

Focus group discussion was held by open-ended responses to discuss the issue of human- hamadryas baboon conflict. Three focus group discussions was held with three groups' each containing 6 individual's randomly selected from three Keble of which four of them are female individual. During the group discussion, the researcher initiated the discussion by posing questions from the questioner list and let them to forward their idea. The discussion was held with the village leaders and community forest authorities. The participants for the focus group discussion were selected with Keble and community forest leader who aware best on the history hamadryas baboon situation in the area. The agricultural extension worker, community forest leader, and Keble leader also take part in the discussion to provide information on human-hamadryas baboon conflict.

2.4.3. Direct Observation on the Crop Damage by Hamadryas Baboon

To observe the extent of crop damage by Hamadryas baboon and to compare the result with the response given by the local people, direct observation was involved by selected three sites. These sites were the farmers plot found near by the forest in, Wote Chimo, Burkitu and Balo aminya. This was used to obtain data on, distance between forest and farm lands, the affected crops, nature of Hamadryas baboon, habitat fragmentation, distance of cultivation land from the forest edge, types of crop most attacked by Hamadryas baboon, season most experience the hamadryas baboon damage and causes of happening human Hamadryas baboon conflict and control measure taken to safe gourd crops from Hamadryas baboon.

2.5. Data Analysis

Data were analyzed using SPSS version 20.0 computer software. Accordingly, descriptive statistic in a form of mean, percentage and were used to analysis responses of the respondent on human-hamadryas baboon conflict. Chi-square test was used to compare responses of the respondents on human hamadryas baboon conflict.

3. Result

3.1. Socioeconomic Profile of the Respondents

Communities residing in the study area are Oromo, Amhara. Respondents taken for formal interview includes 90% Oromo, 10% Amhara. In addition, about 80% of them were male whereas 20% of the were female. Among the respondents, most of them, which represents 50% and 30%, had 1-3 and 3-5 family size respectively. The rest which was 17% and 3% of them had 5-7 and more than 7 family sizes respectively.

The main crop-growing season was from July- November for wet season and from February- Jun for dry season. Barley, Wheat, teff, Maize, beans, are the main crop grown in the area (Figure 4).

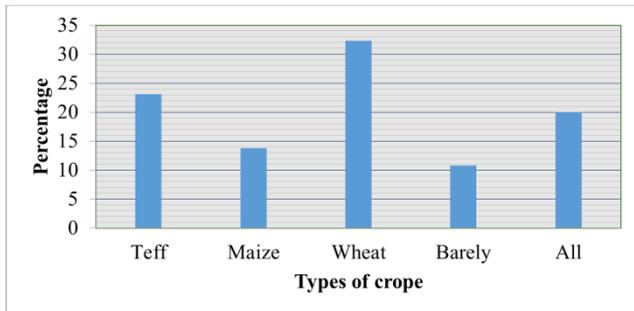


Figure 4. Major crop grown in the study area during 2016/2017 around Walda gebesa, Burkitu, and Wote chimo community forest.

The major economic activities of the sampled household in the study area were crop production, livestock rearing or mixed farming. About 66.9% of the respondents earn their income from mixed agriculture (crop production and livestock rearing). While the remaining 11.5% depends only on crop production and 6.2% depends on livestock rearing and 15.4% depends on crop production and other income as buying and selling goods (Figure 5).

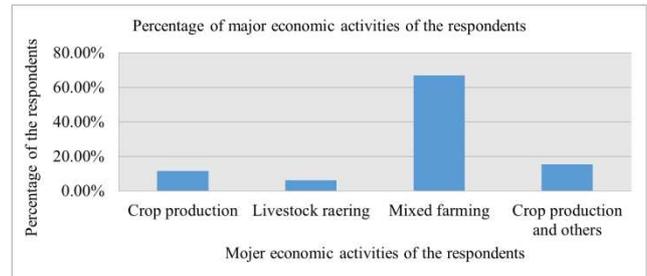


Figure 5. The percentage of major economic activities of the respondent in Wote chimo, Gasera, and Balo aminya Keble in Gasera district.

3.2. Questioner Survey on Human Hamadryas Baboon Conflict

Result of Hamadryas baboon (*Papio hamadryas hamadryas*) is given 8 below. The table shows major causes of hamadryas baboon conflict with human, attitudes of local people towards hamadryas baboon and status of their conservations.

Table 1. Agree Dis-agree responses of the respondents on human- hamadryas baboon conflict in Wolda jabesa, Wotechimo and Burkitu community forest.

Serial/ NO	Reason	Respondents response							
		Strongly agree		Agree		Disagree		Strongly disagree	
		%		%		%		%	
1	Hamadryas baboon raid crop	107	85.6	15	12	2	1.6	1	0.8
2	People plow in and around the forest	35	28	45	36	30	24	15	12
3	Local people kill Hamadryas baboon	17	13.6	25	20	35	28	48	38.4
4	There is over grazing in the forest	44	33.2	27	21.6	37	29.6	17	13.6
5	Hamadryas baboon is a threat to farmers having farm land around the forest	56	44.8	34	27.2	19	15.2	16	12.8
6	Training was given to local people on how to manage conflict with Hamadryas baboon.	15	12	26	20.8	41	32.8	43	34.4
7	Everybody is responsible for conservation.	74	59.2	26	20.8	16	12.8	9	7.2
8	Only central government is responsible for conservation.	27	21.6	12	9.6	35	28	51	40.8
9	Hamadryas baboon kills lamb and goat.	49	39.2	31	24.8	25	20	20	16
10	It is right to get into the forest and cut trees for fire fuel and other reason	20	16	14	11.2	32	25.6	59	47.2
11	Hamadryas baboon is important for economic benefit of local people	27	21.6	23	18.4	41	32.8	34	27.2
12	Your land is secure from Hamadryas baboon	31	24.8	26	20.8	26	20.8	42	33.6

Responses of the respondents on human hamadryas baboon conflict are given in table 1. Most of the respondents responded that people plow in and around the forest and their response was significantly different ($x^2 = 10.63, d.f = 1, p < 0.05$) and there is over grazing in the forest and their response was not significantly different ($x^2 = 2.312, d.f = 1, p > 0.05$). Hamadryas baboon is a threat to farmers having farmland around the forest and their response was significantly different ($x^2 = 24.2, d.f = 1, p < 0.05$). Most of the respondents responded that Hamadryas baboon raid

crops around Burkitu, Wotechimo and wolda jebessas community forest and their response was significantly different ($x^2 = 113.288, d.f=1, p<0.05$), and hamadryas baboon kill lamb and goats their responses was significantly different ($x^2 = 9.8, d.f = 1, p < 0.05$). Some of the respondents responded that local people kill Hamadryas baboon and their response was significantly different ($x^2 = 13.448, d.f = 0.05, p < 0.05$). Some of the local people believe that, as it is right to get into the forest to cut trees for fire fuel and other reason and their response was

significantly different ($\chi^2 = 51.984, d.f = 1, p < 0.05$). Some of the local people believe that natural resource conservation is the responsibility of government their response was significantly different ($\chi^2=17.672, d.f=1, p<0.05$). Training was given to local people on how to

manage conflict with hamadryas baboon their response was significantly different ($\chi^2=14.792, d.f=1, p, 0.05$ and the believe that hamadryas baboon is important for economic benefit of local people and their response was significantly different ($\chi^2 = 5, d.f = 1, p < 0.05$)

Table 2. Distance of the farm land from the forest edge, NR= Number of the respondents.

Village	Near		Medium		far		Too far	
	NR	%	NR	%	NR	%	NR	%
Balo aminya	25	58.14	8	18.6	4	9.3	6	13.95
Wote chimo	21	52.5	14	35	3	7.5	2	5
Gasera 01	7	16.7	20	47.6	9	21.4	6	14.3
Average	17.7	42.4	14	33.7	5.3	12.7	4.7	11.1

As indicated in table 2 above most of the respondents that is 25 (58.14%) in Balo aminya 21 (52.5%) in Wote chimo and seven (16.7%) in Gasera 01 and generally 17.7 (42.4%) average number of the respondents own their farmland near the forest edge. The others respondents that is 8 (18.6%) in Balo aminya, 14 (35%) in Wote chimo, 20 (47.6%) in Gasera 01 and the total average that is 14 (33.7%) of the respondents responded the distance of their farmland is medium from the

forest edge. Some of the respondents 4 (9.3%) in Balo aminya, 3 (7.5%) Wote chimo and 9 (21.4%) in Gasera 01 with the total average of 5.3 (12.7%) responded that their farm land is far from the forest edge. While 6 (13.95%) of the respondents in Balo aminya, 2 (5%) in Wote chimo and 6 (14.3%) in Gasera 01, with total average of 4.7 (11.1%) of the respondents responded that their farm land is too far from the forest edge.

Table 3. Causes of happening Human-hamadryas baboon conflict in and around Gasera community forest.

Village	Crop damage		Livestock raiding		Steeling properties		Crop, livestock and property damage	
	NR	%	NR	%	NR	%	NR	%
Balo aminya	28	65.1	1	2.33	2	4.65	12	27.91
Wote chimo	16	40	3	7.5	1	2.5	20	50
Gasera 01	30	71.42	2	4.76	2	4.76	8	19.1
Average	24.7	58.84	3	4.86	1.7	3.97	13.3	32.33

Causes of happening human- hamadryas baboon conflict in Balo aminya, Wote chimo, and Gasera 01 kebeles of the district is shown in table 3 above. Accordingly 28 (65.1%) in Balo aqminya, 16 (40%) in Wote chimo 30 (71.42%) in Gasera 01 and a total average that is 24.7 (58.84%) of the respondents responded that crop damage was the main causes of the conflict. Livestock raiding by hamadryas baboon accounts 1 (2.33%) in Balo aminya, 3 (7.5%) in Wote chimo, 2 (4.76%) in Gasera 01 with total average of 3 (4.86%) in

three villages of the district. Some of respondents 2 (4.65%) in Balo aminya, 1 (2.5%) in Wote chmo, 2 (4.76%) with the total average 1.7 (3.97%) respondents responded that hamadryas baboon steels their properties. The rest of the respondents 12 (27.91%) in Balo aminya, 20 (50%) in Wote chimo, 8 (19.1%) in Gasera 01 with total average of 13.3 (32.33%) responded that crop damage, livestock raiding, steeling the properties are the main causes of human-hamadryas baboon conflict.

Table 4. Types of crop most attacked by Hamadryas baboon. NR= Number of respondents.

Village	Maize		Teff		Wheat and barley		Maize, Teff, wheat and barley	
	NR	%	NR	%	NR	%	NR	%
Balo aminya	13	30.23	6	13.95	2	4.65	22	51.2
Wote chimo	9	22.5	2	5	4	10	25	62.5
Gasera 01	15	35.7	5	11.9	1	2.38	21	50
Average	12.3	29.5	4.3	10.28	2.33	5.68	22.7	54.6

A type of crop more attacked by hamadryas baboon in Balo aminya, Wote chimo and Gasera 01 is shown in table 4 above. Accordingly 13 (30.23%) of the respondents in Balo aminya, 9 (22.5%) in Wote chimo, 15 (35.7%) in Gasera 01 with the total average of 12.3 (29.5%) of the three kebeles of the respondent responded that maize is the types of crop most attacked by hamadryas baboon, 6 (13.95%) in Balo aminya, 2 (5%) in Wote chimo, 5 (11.9%), in Gasera 01 with the total average 4.3 (10.28%)

responded that teff is the types of crop most attacked by hamadryas baboon. While 2 (4.65%) in Balo aminya, 4 (10%) in Wote chimo, 1 (2.38%) in Gasera 01 with the total average 2.33 (5.68%) of the respondents responded that wheat and barley are the types of crop most attacked by hamadryas baboon. The remaining 22 (51.2%) in Balo aminya, 25 (62.5%) in Wote chimo, 21 (50%) in Gasera 01 with the total average of 22.7 (54.6%) of the respondents responded that all maize, teff, wheat and

barley are the types of crops more attacked by hamadryas baboon in the study area.

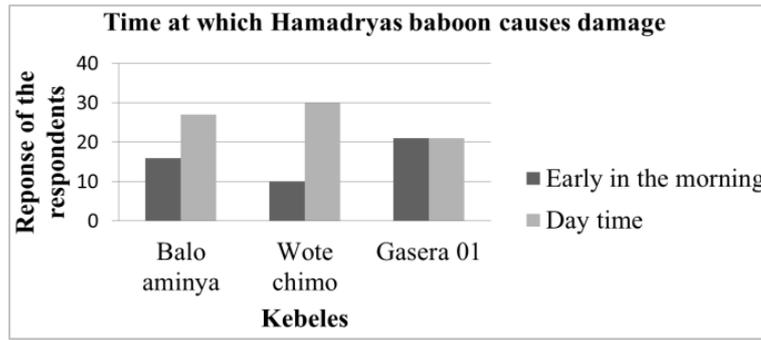


Figure 6. Time at which Hamadryas baboon cause damage in the study area.

Time at which hamadryas baboon causes damage is given in the figure 6 above. Accordingly the total average of the respondents 47 (37.6%) responded that hamadryas baboon causes damage early in the morning while 78 (62.4%) of the

respondents responded that hamadryas baboon causes damage at day time. Their response is significantly different ($\chi^2=7.688$, d.f.=1, $p<0.05$).

Table 5. Types of crop less attacked by Hamadryas baboon. NR= Number of the respondents.

Village	Maize		Teff		Wheat and barley		Non	
	NR	%	NR	%	NR	%	NR	%
Balo aminya	8	18.6	2	4.65	6	13.95	27	62.79
Wote chimo	2	5	3	7.5	4	10	31	77.5
Gasera 01	1	2.38	2	4.76	11	26.2	28	66.67
Average	3.67	8.7	2.3	5.6	7	16.7	28.7	68.99

Types of crop less attacked by hamadryas baboon in Balo aminya, Wote chimo and Gasera 01 are shown in table 5. Accordingly 8 (18.6%) of the respondents in Balo Aminya, 2 (5%) in Wote chimo, 1 (2.38%) in Gasera 01 with the total average of 3.67 (8.7%) of the three kebeles of the respondent responded that maize is the types of crop most attacked by hamadryas baboon. Two (4.65%) in Balo aminya, 3 (7.5%) in Wote chimo, 2 (4.75%), in Gasera 01 with the total average 2.3 (5.6%) responded that teff is the types of crop most attacked by hamadryas baboon. While 6 (13.95%) in Balo

aminya, 4 (10%) in Wote chimo, 11 (26.2%) in Gasera 01 with the total average 7 (16.7%) of the respondents responded that wheat and barley are the types of crop most attacked by hamadryas baboon. The remaining 27 (62.79%) in Balo aminya, 31 (77.5%) in Wote chimo, 28 (66.67%) in Gasera 01 with the total average of 28.7 (68.99%) of the respondents responded none of the maize, teff, wheat and barley were less attacked by hamadryas baboon in the study area.

Table 6. Stage at which Hamadryas baboon attack crops NR= Number of the respondents %= Percentage.

Village	Seedling		Early maturation		Matured		At all stage	
	NR	%	NR	%	NR	%	NR	%
Balo aminya	10	23.25	6	13.95	4	9.3	23	53.5
Wote chimo	2	5	5	12.5	3	7.5	30	75
Gasera 01	21	50	6	14.3	4	9.5	11	26.2
Average	11	26	5.7	13.48	3.7	8.77	21.3	51.67

Table 6. Reveals that stage at which Hamadryas baboon attack crops. Based on that 10 (23.25%) in Balo aminya, 2 (5%) in Wote chimo, 21 (50%) in Gasera 01 with total average 11 (26%) of the respondents responded that hamadryas baboon attack crops at seedling stage. Some of the respondents 6 (13.95%) of Balo aminya, 5 (12.5%) of Wote chimo, 6 (14.3%) in Gasera 01 and with total average of 5.7 (13.48%) of the respondents responded that crop attack by hamadryas baboon was at early maturation. The rest of the respondents 4 (9.3%) in Balo aminya, 3 (7.5%) in Wote chimo, 4 (9.5%) in Gasera 01 with the total average of 3.7 (8.77%) of the respondents responded that they attack crops when they matured. The rest 23

(53.5%) in Balo aminya, 30 (75%) in Wote chimo, 11 (26.2%) in Gasera 01 and in general the total average of 21 (51.67%) of the respondents responded that hamadryas baboon attack crops at all stage.

Figure 7 shows season experience most hamadryas baboon damage. Accordingly, 25 (58.14%) in Balo aminya, 28 (70%) in Wote chimo, 20 (47.62%) of respondents responded that hamadryas baboon attack their crops during the wet season while 18 (41.86%) in Balo aminya, 12 (30%) in Wote chimo, 22 (52.38%) in Gasera 01 responded that dry season experience hamadryas baboon attack. The total number of the respondents responded that wet season 73 (58.4%) and dry season 52 (41.6%) are the season that was experience most

hamadryas baboon damage. Their responses was significantly difference ($\chi^2=3.528$, d.f= 1, $p<0.05$).

Table 7. Control measure taken to safe guard crops from hamadryas baboon.

Village	Fencing		Guarding		Shooting		Chemical deterrent	
	NR	%	NR	%	NR	%	NR	%
Balo aminya	13	30.2	26	60.5	1	2.32	3	6.98
Wote chimo	6	15	28	70	2	5	4	10
Gasera 01	13	30.95	25	59.5	1	2.4	3	7.14
Average	10.7	25.4	26.33	63.33	2	3.24	3.3	8.04

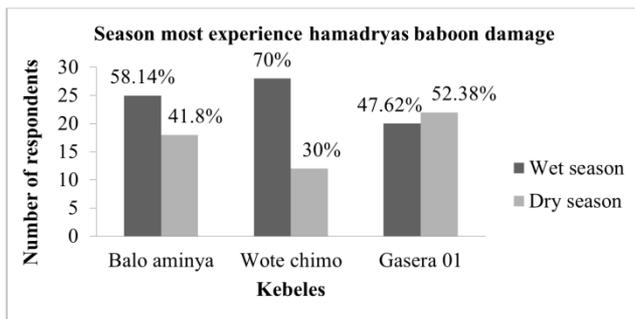


Figure 7. Season experience most hamadryas baboon damage.

The control measure taken by the farmers to safe guard crops from hamadryas baboon is given in table 7. Accordingly fencing accounts 13 (30.2%) in Balo aminya, 6 (15%) in Wote chimo and 13 (30.35%) in Gasera 01. Generally the total average of 10.7 (25.4%) of the respondents in Balo aminya, Wote chimo and Gasera 01 used fencing as the control measure. Most of the respondents 26 (60.5%) in Balo aminya, 28 (70%) in Wote chimo, 25 (59.5%) in Gasera 01 with the total average of 26.33 (63.33%) responded that guarding was an effective method to safe guard their crops from hamadryas baboon. Some 1 (2.32%) in Balo aminya, 2 (5%) in Wote chimo, and 1 (2.4%) in Gasera 01 with an average of 2 (3.24%) of the respondents responded that the used shooting as control measure. The rest 3 (6.98%) from Balo aminya, 4 (10%) from Wote chimo and 3 (7.14%) from Gasera 01 responded that the use chemical deterrents as the control measure in order to tackle the problem with the total average of 3.3 (8.04%).

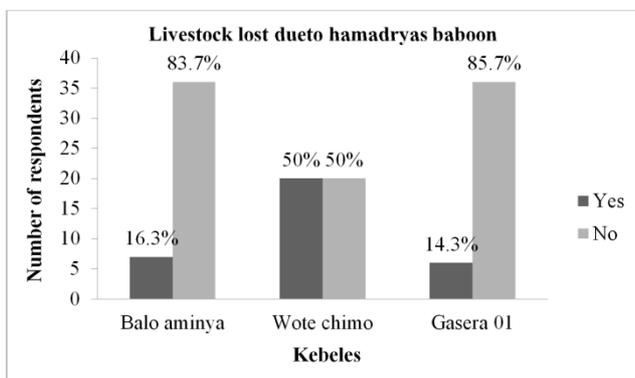


Figure 8. Livestock lost due to Hamadryas baboon.

Figure 8 above reveals the livestock lost due to hamadryas baboon in Balo aminya, Wote chimo, and Gasera 01 kebeles

of the district. Based on that seven (16.3%) in Balo aminya, 20 (50%) in Wote chimo, 6 (14.3%) in Gasera 01 with the respondents responded as they lost their livestock due to hamadryas baboon. The rest 36 (83.7%) Balo aminya, 20 (50%) in Wote chimo, 36 (85.7%) in Gasera 01 with the total number of 33 (26.4%) of the respondents responded that they lost their livestock due to hamadryas baboon and 92 (73.6%) of the respondents responded that there was no livestock lost by hamadryas baboon in the study area.

3.3. Focus Group Discussion with the Local Community

Focus group discussion (one at each village) made with local people showed that in the study area the main underlining causes of human hamadryas baboon around the study area was crop raiding, shortage of the farm land, habitat fragmentation due to human causes as expansion of farm land towards the community forest in all three community forests and road construction that cut across Burkitu community forests which seriously affect the habitat of hamadryas baboon and Leeds to forest clearance and increases rates of human-hamadryas baboon conflict. They posed that they used traditional method as guarding and fencing in order to protect their crops from damage made by hamadryas baboon. Others was the local peoples altitude towards hamadryas baboon they posed that hamadryas boboon does not have economic importance in their surrounding because no any income that was generated by any tourists to facilitate this one they witnessed that there was no any organization which facilitated such operation.

3.4. Direct Observation

Direct observation during both wet and dry season around the three-study site. The distance of the cultivated land from the forest edge, habitat fragmentation duo to fuel wood collection and agricultural expansion, and others as road construction was the major challenges observed in the study area and was major causes of human hamadryas baboon conflict. The damage made by hamadryas baboon was also observed based on that they affect crops as wheat, barley, inset, beans, teff, maize that was grown around the study area in both wet and dry season and wet season was the season that most experience human hamadryas baboon damage. Concerning the types of crops that were attached bay hamadryas baboon, we observed that hamadryas baboon attacked all types of crops. The control measure taken by farmers around the study area was guarding and fencing in both wet and dry season in all study sites.

4. Discussion

The current study confirmed that there is conflict between local people and hamadryas baboon in Wolda jebesa, Burkitu and Wote chimo community forest. Above 85.6 percent of the respondents and 39.2% of respondents responded that hamadryas baboon raid crops and kill lamb and goats respectively. They also kill lamb and goats and steel properties [9]. The baboons to be major pest not only because they are perceived to be more distractive than most other species but also they visit farms frequently, sometimes in lag groups, and can be very persistent. The farmers own farm land near the forest they plow in and around the forest and there is over grazing in the forest. The result was in agreement with the finding of [9] and [6] who reported that farms most at risk to crop losses of crop were near to the forest edge than the far from the forest. This result was in agreement with [13] and [3] who reported increased habitat disturbance as causes of human wild life conflict in Uganda.

The current study confirmed that the control measure taken by people in study area to combat the damage event made by hamadryas baboon is mostly guarding that is 60.8%. The result was go with the finding of [18] in Africa, [5] in Nigeria; [14] in Uganda and [7] in Zimbabwe who founds that guarding and chasing away of animals was ranked first and second in protecting crop raider from crops.

Based on the respondents training was not given to local people on how to manage conflict with hamadryas baboon. As a result the local people's altitude towards hamadryas baboon is mostly negative in that they perceive as hamadryas baboon does not have economic benefit. Some of them believe that it is right to get into the forest and cut trees for fire fuel and other reason pending the responsibility for the government only. Hamadryas baboons are very interesting animal, and provide a great deal of entertainment to people who visit them in zoos. Spatially on Arabian Peninsula, which attract visitors and tourists to view them? Some of these animals have been used in medical research [17]. Hamadryas baboon is common in irrigated agricultural areas and can be terrible crop pests. They are large animals which can be aggressive when converted [17].

5. Conclusion

Hamadryas baboon found in the study area were threatened due to human caused problems as forest clearance for fire fuels, fencing, building house, and plowing near and in the forest as well. This made their uneven distribution in the study area. The above problem also creates human-hamadryas baboon conflict to occur because hamadryas baboon raids their crops as they plow near and in the forest as well. The local people waste their time and energy for keeping their crops from damage. Some of the people catch and kill hamadryas baboon and they believe that hamadryas baboon have no economic benefit. This will have an impact on population size of hamadryas baboon. If the current trend continues, the number of

hamadryas baboon would be at risk and even becomes locally instinct. Therefore, conservation measure should be taken to safe gourd the species of hamadryas baboon along with other wild animals as well.

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