



## **Public attitude and prospective factors of wildlife conservation the case of Gambella National Park, Southwest Ethiopia**

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### **Abstract**

The present study was aimed to assess the attitude and perceptions of the local peoples on wildlife conservation and status of Human wildlife conflict around Gambella National Park. The data for this study was gathered using structured questioners among the sample of 384 randomly selected respondents. Six focus group discussions one per each study villages was held to investigate respondent's perceptions. The data was analyzed using SPSS version 20. The study showed about 349 (90.8%) of the respondent expressed existence of wildlife conservation have negative and no benefit on their economic status. Agricultural expansion and illegal hunting were major threats pointed out by the respondent. Furthermore agricultural expansion and illegal hunting were significantly ( $X^2 = 4.86$ ,  $df = 1$ ,  $p = 0.027$ ) higher in Agnua and Nuer sites respectively. Therefore any developmental practice should give consideration and attention to the rapidly declining natural resource beside to the developmental activities.

**Keywords:** Attitude, Conservation, Wildlife, National Park, Ethiopia.

### **1. Introduction**

The term wildlife is variously understood by different professionals and the community at large. But, the national and international wildlife federations have similar tendency in a term “wildlife”, that include all living things that are living outside the direct control of man (Dasmann, 1968).

Ethiopia is one of the most biophysically diverse countries of the world (Yalden, 1983). She has an area of over 1,023,050 km<sup>2</sup>. It comprises highland massive surrounded by arid lowlands. It contains various wildlife and wildlife habitats ranging from alpine moorlands to lowland savannas, arid lands, and extensive wetlands (Yalden, 1983).

Gambella national park is one of the nine national parks in Ethiopia taken to be the most important wildlife area in the country. The park being of particular importance to large herds of White-eared Kob, which migrate between Ethiopia and the South Sudan, Nile lechwe and Elephants; So far, 41 mammal species and over 154 bird species have been recorded. The park is dominated by moist low lands and wet lands (Rolkier, 2015; Anonym, 2011).

Despite this increased profile and the implementation of a variety of conservation measures and interventions, global biodiversity continues to decline (Butchart *et al.*, 2010). This is particularly true on like

Ethiopia in particular Gambella where limited resources can exacerbate the effects of human overpopulation, related consumption patterns and development pressures (White *et al.*, 2011). Human actions threatening biodiversity, such as over-exploitation, spread of invasive species, pollution and climate change, show no sign of slowing in the near future (Ehrlich & Pringle, 2008).

Human-wildlife conflict involves both humans and wildlife. As a result, must be needed to have a comprehensive understanding of the issues from the pedestal. In order to obtain the necessary information fully, assessing a situation is appropriate to consider the causes of conflict from different perspectives (Hill *et al.*, 2002). This is because the nature and magnitude of the problem varies from country to country and people to peoples depending on human population growth rate, conservation methods and scarcity of critical natural resources, especially land and water (Rabinowitz, 1986).

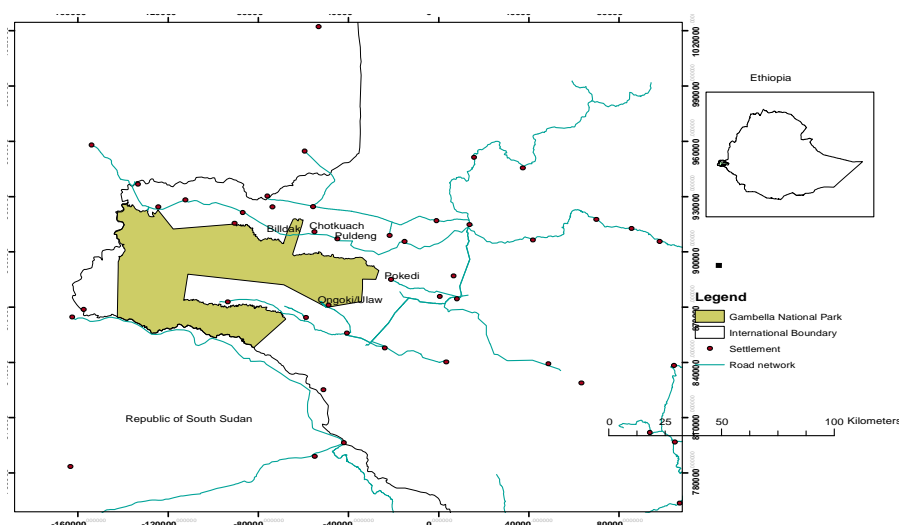
All societies have a substantial body of knowledge, believe and experience from their day to day activities in their environment (Gandiwa, 2012; Uddin and Foisal, 2007). To make conservation of biological diversity easy, understanding local community attitude, awareness level and community participation in the conservation has critical role (Brook and McLachlan, 2008). Therefore, this study was intended to assess attitude and opinion on conservation of wildlife and status of human wild life conflict around Gambella national park, southwest Ethiopia.

## 2. Methodology

**2.1. Study sites:** Gambella National park (GNP) is located 850 km west of Addis Ababa. It was established as a protected area in 1973 to conserve a diverse assemblage of wildlife and unique habitats. Its location is between 33045'- 34015' E and 07030'- 08015'N at the west part of Gambella town, in the Gambella National Regional State. The park is located in the centre of Gambella Regional state between the rivers of Baro and Gilo (Rollier *et al.*, 2015).

**2.2. Description of the national park:** Gambella national park Located on the Baro-Akobo river system it hosts several wildlife not found elsewhere in Ethiopia. These include the Nile lechwe and White-eared Kob (Rollier *et al.*, 2015). The banks of the Baro are rich in birdlife and thus give visitors an extra advantage.

The park has the total area of 5,061 Km<sup>2</sup>, if it is the largest protected area in the country. Its northern boundary is formed by the Baro river. To the south of the park, the Gilo River flows from Gog to Jor in a northwesterly direction. The landscape of Gambella is low and flat with altitude ranging from 400 to 768 m asl. GNP is a vast collection of savannahs, flood plains, reverine forests, lazily flowing rivers and grasslands. The general landscape is flat but it has area of raised ground that supports deciduous woodlands and grasslands. Major wildlife conserved includes white-eared Kob, Nile Lechwe, Roan Antelope, Topi and Elephant. The near threatened Shoebill and Basra Reed Warbler birds have been recorded from here back in the 1960s (Rollier *et al.*, 2015).



**Figure 1:** Map of the study area (source: Ethio\_ GIS Data Base, ESRI ARC\_GIS 9.3, 2008)

**2.3. Preliminary survey:** The preliminary survey was conducted for the sake of gathering reliable information. During this period all the available and relevant information and literature on the Gambella National Park and Peoples around the parks was reviewed and assessed. Attempts was made to find information on accessibility, infrastructure, land escape, settlement, the interaction of people vs wild life, the buffer zone and approximate size of the core area of wildlife. To incorporate this information, pilot survey was designed.

**2.4. Pilot test (survey):** Forty (40) individuals (peoples) were randomly selected and interviewed in the study area. These pilot questions were not included in the result analysis. The main purpose of the pilot survey was to evaluate the questionnaire and to check whether it is applicable and suitable for the study area. It is also used to check the question whether it is understandable or not by the people. Then based on the result from the pilot survey, the questionnaire was revised and improved.

**2.5. Sample size determination:** Since the estimated population around the national park would be beyond 10,000, hence, by the assumption of normal distribution the sample size was determined as the following.

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \text{ Where } n_0 = \frac{Z_{\alpha/2}^2 pq}{d^2}$$

n = sample size

d= margin of error

N = total number of house heads near by the national parks

p= proportion of population

= level of significance

Z= Score of normal distribution

Q = 1-P

Where: d = 0.05

p = 0.5

=0.05

$$n_0 = \frac{(1.96)^2 \times 0.5 \times 0.5}{0.05^2} = 384$$

**Note** by taking the population proportion (0.5) and without using sample size correction formula

**2.6. Data collection Methods:** Data collection was conducted from March-April, 2015. It involved a sample of 384 local people from six villages in two different side communities adjacent to the Gambella National park. Three villages were selected from Site 1 (where Agnuak population predominant) and Site 2 (where Nuer population predominant) respectively. The study was carried out by means of a semi structured questionnaire and focus group discussion (FGD) that was designed and conducted in each six sampled villages.

**2.7. The questionnaire survey:** The questionnaire survey, which formed part of a broad study on human effects on GNP, the self-structured questionnaire will be administered to members of the household on a random manner based on first come first serve basis and alternating male and female respondent's as much as possible and different age groups (Kumssa and Bekele, 2013).

In the household survey, people were interviewed by native speakers. Training was provided for the interviewer on how to fill out forms and how to approach sensitive questions on interaction and activity under taken around boundary of the national park. To gain people's confidence, every household was visited prior to the interview and the purpose of the study was clearly presented.

**2.8. Focus group discussion (FGD):** Focus group discussion was held to appropriately clarify, validate, and frame the issues to be covered later in the survey instrument. FGD provides an opportunity to interact with representatives of the intended survey population and to gain relevant information about their indigenous knowledge, and attitudes regarding wild life conservation and human-wildlife conflict status.

Three pre-designed open-ended questions was used (Appendix 1) for gathering information. Six FGDs was conducted; one per each sampled villages. The group size in each discussion varied from 10 to 15 people. The FG was formed by heterogeneous (male& female, young and elder villagers) group of community including conservationist. Information collected from group discussion was collated, summarized using a content analysis method, and presented in a narrative fashion (Kumssa and Bekele, 2013).

**2.9. Ethical considerations:** The study legalized by Gambella University research committee. The study was not having any ethical implication on the study population. By respecting their beliefs, norms and culture the respondent was informed about the objective of the study and their agreement was taken orally before interaction. Any personal information was kept confidentially.

**2.10. Data Analysis:** Statistical package (software) SPSS version 16 was used to analyze the data. Each question was coded to run SPSS 20 (Chi-square and Cross sectional descriptive statistics was carried out to calculate frequencies, and to allow cross-tabulations (Field, 2000). Result of FGD was analyzed by content analysis method and narrative fashion.

### 3. Results

**3.1. Demographic Information:** The researchers started by a general analysis on the demographic data got from the respondents which included; - the gender, age and educational level.

**3.2. Gender and age composition of Respondent:** From the demographic data gathered in the present study, about 234 (60.9%) and 150 (39.1%) of the respondent were male and female respectively. On the other hand the age category of the respondent were 18-30(38%), 31-50(47.9%) and above 50(14.1%) (Table 1).

**Table 1** Gender and age composition of the respondents of the study area, southwest Ethiopia /2015

Gender	Frequency	Percent
Male	234	60.9
Female	150	39.1
Total	384	100
Age in years		
18-30	146	38
31-50	184	47.9
Above 50	54	14.1
Total	384	100

The study showed, about 77.8 % of the respondents were illiterate, while 18% of the respondents were attended the primary education; whereas 3.9 % and

0.3% of the respondents were completed secondary and higher education respectively (table 2).

**Table 2.** Educational status of the respondents of the study area, Gambella region, south west Ethiopia / 2015.

Educational status	Frequency	Percent (%)
Illiterate	299	77.8
primary school	69	18
secondary school	15	3.9
Above secondary school	1	0.3
Total	384	100

### 3.3. Attitudes and perception of the local people to ward wildlife conservation

Table 3 shows views of the respondent among the study villages towards the presence of Gambella National Park. The finding revealed that about 140 (36.5 %) respondents like the presence of the national park where as 244 (63.5%) dislike the presence of the

national park. However the finding indicated the views of respondent were significantly ( $X^2 = 34.18$ ,  $df = 5$ ,  $P = 0.000$ ) vary among the study villages. Likewise the views of the respondents had significant ( $X^2 = 10.300$ ,  $df = 3$ ,  $p = 0.016$ ) association among the level of education towards the presence of GNP and its wildlife conservation.

Table 3 Local community views towards the presence of GNP in the study site village /2014-2015

Do you like the presence GNP?	Study village						Total
	Pokedi	Olaw	Onkongi	Poldiang	Choet kouch	Beldag	
yes	10	22	16	31	23	38	140
No	54	42	48	33	41	26	244
Total	64	64	64	64	64	64	384

Out of the 384 respondents 191 (49.7 %) said existence of wildlife conservation has negative impact on their economy while 158(41.1%) responded the conservation effort has neither positive nor negative impact on their economic status where as only 35 (9.2 %) supported the conservation effort has positive

impact on their economy (Table 4). On the other hand the Ki-square association reveals there was no significant ( $X^2 = 1.775$ ,  $df = 2$ ,  $p = 0.412$ ) different between Agnua and Nuer site on the attitude to the presence of Gambella national park.

**Table 4** The impact of conservation effort on the respondent economy around Gambella national park, Gambella region south west Ethiopia / 2015

Attitude of respondent	Frequency	Percent (%)
Positive	35	9.1
Negative	191	49.7
Neutral	158	41.1
Total	384	100.0

### 3.4. The status of human wildlife conflict

From the findings, almost all 367 (95. 6%) of the respondents indicated that they encountered conflicts with wild animals. Among the problems detected as causes of the conflict the highest 221 (57.6%) was responded crop damage while 142 (37%) was indicated domestic animal predation by Wild animals as the cause of the conflict (Table 5).

As per the respondent revealed the type of problems faced due to wildlife was significantly ( $X^2 = 60.817$ ,  $df=3$ ,  $p=0.0001$ ) varied between Agnua and Nuer site. The linear by linear association shows crop damage by wildlife of Agnua sites significantly ( $X^2 = 38.729$ ,  $df=1$ ,  $p=0.0001$ ) higher than Nuer sites while livestock predation in Nuer site significantly ( $X^2 = 38.729$ ,  $df=1$ ,  $p=0.0001$ ) higher than Agnua site. In addition there was association between study villages and problem faced the community due to wildlife around Gambella national park ( $X^2 = 84.942$ ,  $df = 15$ ,  $p = 0.0001$ ).

**Table 4** Problems faced to the community due to wildlife, around Gambella national park, Gambella region, South west Ethiopia / 2014- 2015

Type of problem	frequency	Percent (%)
Crop damage	221	57.6
Predation	142	37
Disease transmission	3	0.8
Others	1	0.3
no problem	17	4.4
Total	384	100

The finding revealed that, agricultural expansion 169 (44 %) was the highest impact of human to wildlife habitat while illegal hunting 128 (33.3%) was the second highest threat, where as overgrazing 38 (10%) was the lowest (table 6).

The chi-square result showed that there was association ( $X^2 = 83.376$ ,  $df = 3$ ,  $p = 0.0001$ ) between villages of the study sites and effects of human on the wildlife habitats (table 3). Like wise agricultural expansion and illegal hunting showed significantly ( $X^2 = 4.86$ ,  $df = 1$ ,  $p = 0.027$ ) higher with Agnua and Nuer site respectively. The Mann Witney (Wilcoxon) test revealed that threat (impact) of human to wildlife between Agnua and Nuer sites was revealed similar

trends ( $W = 34988.500$ ,  $Z = -2.772$ ,  $p = 0.053$ ) between the two study sites (table 6).

However the habitat alteration (agricultural expansion) was shown significant ( $W = 34368.000$ ,  $Z = -2.772$ ,  $p = 0.006$ ) different between Agnua and Nuer sites by being higher in Agnua site. On the other hand the kruskal Wallis test indicated that there was significant different ( $H = 21.429$ ,  $df = 5$ ,  $p = 0.001$ ) in agricultural expansions between the study site villages. Of the villages the highest respondent indicated in Pokedi village where as the lowest was indicated in Choet Kouch village with mean rank of 223.00 and 154.00 respectively.

**Table 6** Impact of human on wildlife habitat, around Gambella national park, Gambella region south west Ethiopia /2015

Impact type	Frequency	Percentage (%)
Illegal Hunting	128	33.3
Deforestation	51	13.3
Agricultural expansion	166	43
Overgrazing	37	9.4
Others	2	0.5
<b>Total</b>	<b>384</b>	<b>100</b>

### 3.5. Focus group discussion results

Do you think the presence of the national park close to your area benefited the community?

About three fourth of the discussants expressed that we neither benefited nor harmed from the national park whereas one fourth of the respondent suggested that we harmed due to the presence of the National park, The reasons behind this varied slightly among the group, however the major reason they point out was the loss of crop, livestock due to wild animal and predation respectively. Additionally some participant voiced movement in the area for grazing livestock and other activities restricted due the national park.

Do you think that local people and livestock affect wildlife? How do local community and wildlife in the national park coexist in peace and harmony?

About ninety percent of respondent witnessed that as local people and livestock affect wildlife;

subsequently most of them strength the idea of coexistence if the community conserve wildlife there is a mutual benefits between the community and wildlife as well as conservationist. However the rest respondent said that still now even though we didn't see the tangible benefit from the area and conservation but no conspicuous effect on wildlife had not been observed. The majority of respondents witnessed that they did not receive any benefit from the existence of the national park. The expected benefits were opportunities for jobs, social services such as clinics, schools and resources. In addition some of the group under lined that if there is conservation and sustainable utilization of the community adjacent to the protected area, the local community will have positive attitude toward conservation.

To increase the local community benefits and at the same time securing the National Park, what should be done by the local community by conservationist, by the government respectively?



The majority of the participant reacted that “we as community have to keep our environment, try to shepherd and keep our live stokes and crops respectively since they are the means of conflict with wildlife, additionally some respondent expressed having the viewpoint of seeing wild animals as their “second livestock “again they voiced that conservation brings about harmony. Moreover participant said that “we are the first community who benefit from this conservation area hence great effort expected from us”. On the other hand under questions ‘what expected from the government and conservationist’; participant voiced that government should give concentration not only for the conservation area but also for the community, furthermore they suggested that, security for people come to visit the area, for the wildlife, facilities such as basic infra structure and promotion of the national park must be fulfilled.

#### 4. Discussion

Local people negative perception on the National park highly influences the wellbeing of the national parks. This may be due to many of the local communities in wildlife areas do not receive benefits and yet they bear the costs of living with wildlife. As a result, the communities develop a negative attitude towards conservation. However, despite the costs of living with wildlife, some communities have retained a positive attitude towards conservation. The perception of the respondents about the presence of Gambella national park and its benefit to the nearby community was assessed. The majority of the respondents were showed that the park would not benefit them whereas highest number of the respondents dislikes even the presence of the park in their surroundings the finding partially in agreement with the study made in Cameroon (Ebua, 2011). However, this finding was in agreement to the work reported by Kumsa and Bekele (2013) and Kumsa and Bekele (2014) at Abijata Shala National park and Senkele sanctuary respectively, which showed that the protected area would be threaten their economy by reducing access to expand farming and to have pasture land, settlement, fuel wood collection and extraction of minor forest products this might be due to shortage and availability of resource. For instance, the communities living in Gambella region have more access of farming lands as compared to the high land areas of the country. This in turn plays a great role in changing the attitude and perception of the local community towards protected area and wildlife conservation.

Different factors may influence the attitude and perceptions of the local community towards a protected area and wildlife conservation particularly the benefits obtain and the constraints from a specific national park are the primary factors. In the present study the findings revealed majority of the respondents suggested that they dislike wildlife because of the damage posed by wildlife to their properties. Besides to the above mentioned factors level of education, the livelihood of the local communities as well as distance from the national park have significant role on the attitude and perception of the local community towards the protected and wildlife conservation(Muluken, 2014).

In the present study a significant variation was observed among local community by the level of education towards the presence and benefits of the Gambella National park. As the level of education increases respondents strongly supported the presence of Gambella national park its wildlife conservation even though, most of participants have not obtain any formal education.

Human populations expand year after year, which resulted in competitions for resources between wild animals and human populations (Kagiri, 2000). This competition for resources causes conflict between wild animals and people. Human wildlife conflict problem is become aggravating that is why currently most problems reported elsewhere is human wildlife conflict (Yosef, 2014; Muluken, 2014; Mojo *et al.*, 2014; Kumsa and Bekele, 2013; Yehune *et al.* 2009). The degree and extent of human-wildlife conflict is determined by the multiple factors influenced by human and wildlife population. Coexistence of both the factors will lead to the stable state of human wildlife conflict (Dickman, 2008).

As the finding showed almost the entire respondent witnessed the presence of human wildlife conflict in the area furthermore most of the local people supposed that, cases of the human wildlife tension have been increasing and will increase in the future also this finding in lined with Muluken, (2014). Similarly, the finding revealed that almost all of the respondents asked in the study area perceived that the degree to which wild animals affecting their property has been increasing. The identified problematic animals included crop damage (Baboons, warthogs,) and predators (leopard and Lion) were the major threats respectively, this finding in agreement with Mojo *et al.* (2014) and Ayadi (2011) findings. Since crop

cultivation and livestock rearing is option for income hence the local community might have tendency to raise a conflict with wildlife.

Furthermore as the finding showed majority of the people's attitude toward conservation is negative and neutral, however this neutrality of the people has equal chance to shift their view to negative. Likewise the conservation attitude of local communities living adjacent to the protected areas is highly influenced by the problems associated with wildlife. According to Newmark *et al.*, (1994) people living surrounding the protected areas that are unable to control the losses caused by wildlife are likely to develop negative attitude towards wildlife. Especially, in communities with a subsistence economy, even small losses can generate strong negative attitude towards wildlife (Oli *et al.*, 1994). On the other hand, people who get benefit from natural resources are likely to support the wildlife conservation efforts and protected areas (Tefera, 2001).

In the study area, the natural habitats of the animals were modified into crop cultivation. Human impact on wildlife include the expansion of agricultural development, illegal hunting of wild animals, deforestation, overgrazing were among the impacts have been indicated by respondents, similar findings were reported in different parts of Ethiopia (Mojo *et al.*, 2014; Muluken, 2014; Yosef, 2014).

The finding indicated that the major threat that encountered wildlife by humans were agricultural expansions and illegal hunting. As advocated in the study, the agricultural expansions were due to the large scale agricultural investment at the adjacent part of the national park in the area which was given by the government to the private investors. The perceived extents of agricultural expansion, and illegal hunting were found to be critical. However the extents of how much the above anthropogenic activity affect the protected area did not determine in the present study. Local peoples of the study area more of small holder and agro pastoralist and they have little experience in agricultural practiced as compared to the highland parts of Ethiopia further more among six study villages the highest large scale agricultural expansion was indicated in Pokedi village that found around Alowero swampy area and which is the key area where Nile Lechwe (*Kobus megaceros*) is found (Rolkier, 2015). Since Nile lechwe (*Kobus megaceros*) is non migratory and wetland lover antelope and its population has been declining in the mean time

(Rolkier, 2015, Annonym, 2011). Additionally the major threat to wildlife by human occurred in highland part of the country is habitat shrinkage (fragmentation) and agricultural expansions as reported by (Kumsa and Bekele, 2013; Yehune *et al.*, 2009; Ashenafi and Leader-Williams, 2005) in contrary to this study illegal hunting was not reported as major treat at highland parts of the country, however, in Africa in particular Tanzania where Serengeti national park found similar problem was reported by Bitanyi *et al.* (2012). Since Gambella national park is one of the protected Area in Ethiopia where the second highest seasonal migration of large and medium size mammal's population occurred in Africa next to Serengeti National park. Hence the problems such as illegal hunting should not be considered as simple threat because hunting conducted by gun fire (modern fire arms) is big problem for wildlife existence and conservation management (Tedla, 1995).

## Conclusion and Recommendation

The finding reported in the present study showed that the local people perception towards the conservation of wildlife nearby Gambella national park has the complex socio-economic and environmental impacts on the study area. The finding assured presence of human wildlife conflict in the area. Habitat alteration (agricultural expansion) and illegal hunting were the major threats of human impact on wildlife and wildlife habitat respectively. To bring sustainable wildlife management and rural community development around Gambella national parks requires reconciling the interest of stakeholders. We cannot say agricultural expansions should stop but we recommend that any developmental practice should give consideration and attention to the rapidly declining natural resource beside to the development. Hence there should be choral relationship between agricultural investors and conservationist as well as find out possible ways in which both activities go harmonically side by side.

## Acknowledgments

The authors would like to appreciate Gambella University Research and Community service for financial support. Our great thanks are also goes to individual respondents from different districts of Gambella Region particularly the study villages for facilitating the study. Lastly but not the least, we are grateful to Gambella National park and staffs for providing vital information and facilities for our study.



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#### How to cite this article:

Mohammed Seid and Behailu Taye. (2018). Public attitude and prospective factors of wildlife conservation the case of Gambella National Park, Southwest Ethiopia. *Int. J. Adv. Res. Biol. Sci.* 5(10): 117-126.  
DOI: <http://dx.doi.org/10.22192/ijarbs.2018.05.10.012>