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**Wondo Genet College of Forestry and Natural Resource**

**Department of Wildlife and Protected Area Management**

**M.Sc. Program in Wildlife Ecology and Conservation**

**Project Tittle; Potential wildlife resource and their challenges for community - based conservation development in Gambella National Park**

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Date August 16, 2021

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# 1. INTRODUCTION

Ethiopia is located at 3°30'N and 15°00'N latitude and 33°E and 48°E longitudes in the horn of Africa, and one of the wildlife biodiversity centers of the world (Yalden and Largen, 1992). It is one of the top 25 biodiversity-rich countries in the world and has hosts two of the world's 34 biodiversity hotspots: the Eastern Afromontane and the Horn of Africa hotspots (Ethiopian Biodiversity Institute, 2014). The country has more than seven large mammals (Amare, 2015). From the total wildlife resources, more than 320 mammals (39 endemic), 918 birds (19 endemic), 240 reptiles (16 endemic), 71 amphibians (30 endemic) and 172 fishes (38 endemic) species are recorded in Ethiopia (Vreugdenhil et al., 2012). It has more than 25 national parks, 3 wild life sanctuary, 8 wild life reserves, 18 controlled hunting areas, 7 open hunting areas, and 3 community conservation areas (young, 2012). Area of land covered to wildlife conservation is 213,464 km<sup>2</sup> (Ethiopian Institute of Biodiversity Conservation, 2009). From this a total of 15% of the country's land is protected covering national parks, wildlife sanctuaries and reserves, controlled and open hunting areas and community conservation areas (Biodiversity Indicators Development National Task Force, 2010). It has diverse floral diversity, more than 6500 species of vascular plants (with 625 endemic species and 669 near-endemic species, and one endemic plant genus) and ranked the fifth largest floral country in tropical Africa (Young, 2012).

In our country many national parks are threatened due to the human actions threatening biodiversity, such as overexploitation, spread of invasive species, pollution and climate change, human wildlife conflict (Ehrlich & Pringle, 2008). Conflicts over natural resources between the communities living adjacent to national park is inevitable because of changes in land use and accompanying new ideas about wildlife resource management and utilization (Magige, 2012).

Community based conserving area is defined as modified natural ecosystems with significant biodiversity, ecological, related cultural values and voluntarily conserved by local communities and indigenous peoples through legal ways (Kohli and Jardhari, 2002). It seeks to integrate utilization of natural resource with rural development and participatory action to the resource management both inside and outside PA. In Community-based conservation, communities themselves set the priorities to conserve natural resource. In sub-Saharan Africa, natural resources are central to rural people's livelihoods economy and resource usage being affected by government policies (Roe et al, 2009). But many indigenous African communities often developed and build complex resource management systems (Fabricius, 2004). Local communities are relevant stakeholder that plays crucial roles being in the management of natural resources and largely recognized by conservationists and development practitioners.

## 1.1 Background Justification

During, 19th century, the interests of local communities and the goals of conservation were considered as opposite to each other (Kelboro and Stellmacher, 2012). After 1970's community come to develop community -based conservation development program. The human population

settled near to the protected areas over the years has been changing in terms of its size, density and livelihood strategies (Masanja, 2014).

In Ethiopia, like Menz Guassa Community Conservation Area is an example and has been used for millennia with unrestricted access for fuel wood collection, livestock grazing, fodder grass and medicinal plant collection by the surrounding communities (Ashenafi et al. 2012). Community based conservation development is significantly contributions for the protection of environment and the growth of economy, improvement the quality of life of the host community and decision making process of various stakeholders (Teshome 2018). Community-based conservation is initiatives things with different aims, governance systems, and levels of local decision-making power, extending from self-regulated to co-managed conservation strategies (Dudley 2008). The initiatives of community are sometimes developed to respond to the failure of top-down conservation models (Berkes,2007). The strategy to reinforce conservation initiatives led by self-governing communities (Armitage 2005). The primary aim is to protect natural ecosystems and use natural resources in a sustainably way, to conserve ecosystems and habitats together with associated cultural values and natural resource management systems (Dudley, 2008). Conservation activities sustainability especially in protected areas is determined by the nature of community's support (Adams et al, 2004). The basic tools to improve the effective conservation of national park are; community participatory approach, collaborative management and set appropriate governmental policy (Adams and Hutton, 2007; Goldman, 2003). To develop and strength conservation of biological diversity, understanding local community perception, attitude, awareness level and community participation in the conservation has critical role (Brook and McLachlan, 2008). The participation of community in protected area help to improve conservation as well as tourism activities in and around protected areas (Elliott & Sumba, 2010; Nthiga et al., 2011). Sustainable use approach in protected area requires partnership with local communities (EUROPARC, 2012).

## **1.2 Statement of problem**

In our country Ethiopia, most of the protected areas do not have legal status, and not well adequately protected. Even if some of the gazette national park are facing problems that could potentially deteriorate them (Ethiopian Institute of Biodiversity, 2014). The extent of protected areas and biodiversity conservation of the country not as such effectively managed, because lacking protected area networks, lacking community-based approach and management action plans (Biodiversity Indicators Development National Task Force, 2010). Local community settled both within and adjacent to national parks and highly compete with biological resource. Most of the national park in Ethiopia, are not community-based conservation approach's because almost all park is administrated and owned by federal or regional governments with no or little participation of local community. The conservation strategy was applied top-down approach rather than bottom-up approach. Top-down approach did not effectively participate community it remains only paper park. However, bottom-up practice highly participate community and improve ability of conservation activity. In Ethiopian, Community settled to the national park have not adequate or

enough knowledge about benefit of natural resource. The local people's attitude to the national park is not positive because of lack of participation in benefit and management of the park (Wana,2008). In Ethiopia, community-based conservation areas are very limited and not such practiced. Gambella National Park is administered by federal governments Ethiopian wildlife conservation authority and at the beginning not community-based conservation area. Vertical and horizontal linkages and relationships were inadequate among local, regional, national and international conservation institutions in many Ethiopian national parks including Gambella national park. In the study area there is little scientific study that investigated the potential wildlife resource and their challenges of community-based conservation development. Therefore, the proposed research is aimed at bridging the research gap and contributing for sustainable wildlife conservation through investigating the potential wildlife resource and their challenge of community- based conservation development in Gambella national park.

### **1.3 Objective**

#### **1.3.1 General objective**

- To investigate the potential wildlife resource and their challenge for community-based conservation development in Gambella national park

#### **1.3.2 Specific objective**

- To examine the diversity and relative abundance of mega wildlife species; large mammals and birds.
- To identify the major challenges that affects the national park as well as community- based conservation success in the study area
- To investigate the opportunities of community-based conservation practice and strategy for the sustainable development of park.

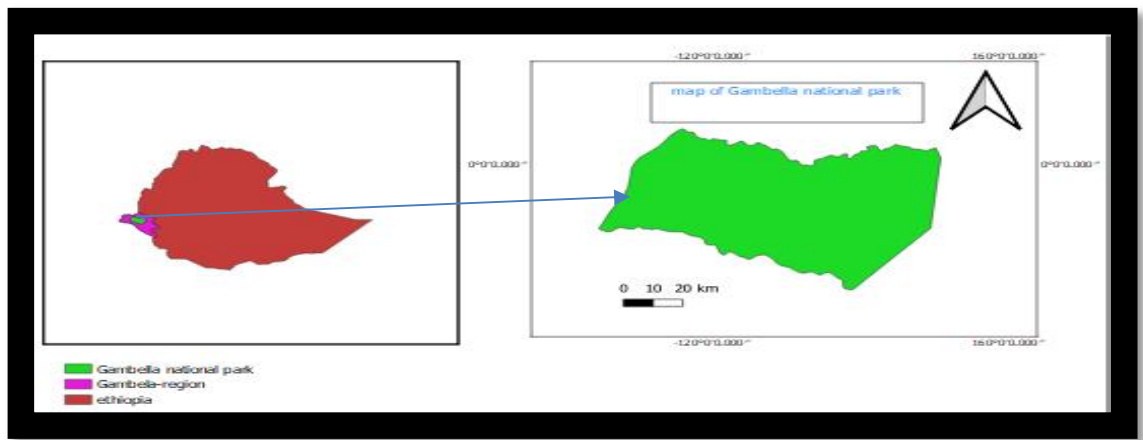
#### **1.4 Rationale of study area**

The main rationale of the study is to identify the current potential wildlife resource, their major challenge and build linkage between ecological value and community adaptive management practice (Berkes et al. 2003). The community-based conservation also contributes great role to the national park. To achieving biodiversity conservation through effective links between national parks use, management, local communities, and alternatives approaches to the national parks. To improve conservation of wildlife resource by making local people as participants, partners, or beneficiaries in management. To make national park as networks, featuring green corridors, cooperation and integrated of regional conservation in wider landscapes beyond protected area boundaries. Especially give priority to the community and participating in decision makers as well as give responsibility to the conservation of resource. To develop bottom-up approach rather than top-down approach. The study will be important to influence decision making process of different stakeholders like NGO, policy makers, local community and integrate the livelihood aspect of community in their conservation activity. This help to ensure the sustainable utilization of resource in protected area and reduce the potential conflict of interest to the resource. Generally, to develop community -based conservation success to the national park by cooperated with other organization.

# 1. METHODOLOGY

## 2.1 Description of study area

Gambella National Park is one of the Ethiopian national parks located in the lowland plain of the Gambella People's National Regional State of Ethiopia. It is one of the largest national parks in Ethiopia. Currently it covers an area of 4,575 km<sup>2</sup>. According to Monico and Schapira, (2015) the park is situated between 32°59' and 35°23' longitude and 6°17' and 8° 42' latitude. It is situated between two major rivers Baro and Akobo and crossed by other three major rivers with three wetlands. It was established in 1973. It is far from 850 km west of Addis Ababa and 15 km south of Gambella town. Altitude ranging from 400 to 768 m asl.



**Figure 1. map of Ethiopia and study area (source QGIS, Created by Chalachew Alemneh in 2013)**

### 2.1.1 Wild animal and Vegetation cover

More than 41 larger mammals are existed some of those are Buffalo, Elephant, White-eared Kob, Hippopotamus, Nile Lechwe, Giraffe, Warthog, Topi, Waterbuck, Roan Antelope, Burchell's Zebra, Bushbuck and Reedbuck and reptile like Nile Crocodiles. Additionally, more than 300 bird species like water birds like the Shoebilled Heron, Basra Reed Warbler and Demoiselle Crane.

The major vegetation types that are found in the park are woodland, wooded grassland, grassland, and wetlands. In the last year in 1980s, there has been large scale habitats changed to small scale mostly due to human pressure. At present, both large scale agricultural investments and small-scale agricultural investments from different national investors reduced the park area from 5,061 km<sup>2</sup> to 4,575 km<sup>2</sup>. Therefore, these anthropogenic impacts have affected both wildlife and their habitats.

## 1.2 Research design

The data to study diversity and relative abundance of mega wildlife species; large mammals and birds in the national park will collect through direct observation from the established transect line in each habitat type. The study area will be stratifying into different parts-based on types of



habitats: Different length of transect line will use based on the habitat's vegetation type and topography. At least total of 45 transect lines will be systematically chose. All transects will do quietly by walk and the conduct survey early in the morning (6:00 a.m. to 11:00 a.m.) and late in the afternoon (3:00 p.m. to 6:00 p.m.). In transect lines walk by the interval of 2 days and each transect line will observe twice a day (morning and late afternoon). At least three individuals will assign in each transect line at the same time.

The diversity and relative abundance of both large mammal and birds will compute using the Simpson Diversity Index and the Shannon–Weaver Diversity Index.  $H' = -(\sum P_i \ln P_i)$  (1) Where,  $P_i$  is the proportion of the species relative to the total number of species (multiplied by the natural logarithm of this proportion,  $\ln(P_i)$ ), and the final product multiplied by -1. Simpson Diversity Index (1-D) is a measure of diversity that takes into account both richness and evenness. It will be measure by:  $D = \frac{1}{\sum n(n-1) \div N(N-1)}$ . (2) Where  $n$ =the total number of large mammal and birds of a particular species,  $N$ = the total number of birds of all species in the given habitat. Species richness (S) is defined by:  $S = \sum n$ . Where,  $n$  is the number of species in a community. Species evenness (E) will use to evaluate by Shannon’s equitability index (E) which will calculated by:  $E = H' / H_{max}$ .

The research will be carried out both qualitative (field observation, focus group discussion and pictorial analysis) and quantitative (Semi- structured questionnaires). Cross sectional data collection will use to isolate important variables. The preliminary survey will be conducted for the purpose of gathering reliable information. During preliminary survey all the available and relevant information about current potential wildlife resource, their challenge, interaction and perception of Peoples to the parks will review and assess. Three villages will select based on the distance to the park namely one site from Agnuak population predominant and Site two from Nuer population predominant. The study will Carry out both a semi structured questionnaire and focus group discussion (FGD) that will design and conducted in each sampled village.

### **2.3 Sampling size and technique**

For the study purposive sampling technique will employee to select the sample kebeles from the selected districts depends on the recommendation of the park officials by considering the level interaction, benefit gaining of resource, distance and dependency on the national park. The target groups will the districts in to three kebele; Karaturi, Rushi, and Saudi Star people. By the definition Kebele means it is the smallest governmental administration unit of the district in the study area. Stratified sampling technique will also use to count diversity and abundance of species. Simple random sampling technique will also use to select the respondent households and which will conduct by giving codes to the whole households and using lottery method that gives equal chance for all households to be select. The sample size of the respondents will use at least 5% of the total households from each selected kebele. The reason behind to use this technique is to get accurate information from the total household without leads to biasness. The sample size of the study will

determine based on Kothari formula for determining the sample size of respondents from the finite population as follows

$$n = \frac{z^2 p \times q \times N}{e^2 (N - 1) + z^2 \times p \times q}$$

Where: N is total size of household population, n is Sample Size for finite population, Z is Z value which is 1.96 as per table of area under normal curve for the given confidence level of 95%, e=margin of error is the plus or minus figure usually, expressed as decimal ( $\pm 0.05$ ). The researcher desires to be use 95% confident that the percentage will estimate.  $p=0.5$ , p=sample proportion, success for each household to be include in the sample,  $q=1-p$ , failure for each household to be included in the sample.

## **2.4 Data collection method**

Data collection will be carried out both quantitative and qualitative data. During this, knowledge of the local people will use to locate surveying sites and identify potential transect line within each habitat type. Data will collect from November 2021 to February 2022. Binoculars and video camera were used during data collection period in the field. Additionally for the objective second and third will use social survey.

### **2.4.1 Questionnaire:**

First questionnaire will prepare for interviewing the respondent. This research data collection method will be use for the data collection from local community, tour guide, cultural and tourism office. Those local communities are the major part of research and they know about the potential wildlife resource, their challenges of CBC success, gaining of benefit from the parks as well as interaction of community to the park. The survey questionnaires will include both open-ended and closed questions in order to design and present the data.

### **2.4.2 Interview:**

For the interview key informant plays a great role in the research includes; local community, cultural and tourism employee will be use. Research will gather in depth information from individuals through face to face. Interviewers who will randomly select from three kebele. Totally interview will be preparing for 90 respondents from total kebeles.

### **2.4.3 Field Observation:**

This method of data collection will be use in order to directly counting species diversity and abundance of both large mammals and bird species. Help to understand conservation status and participation of community to the park in the study area. Furthermore, it is very important to get deep understanding about the interaction of community with national park as well as to collect accurate data from the field through directly. By this method the research will able to distinguish potential wildlife resource and their challenges for the CBC development in the park.

### **2.4.4 Focus group discussion**

This will use as a complementary for household survey. The information will collect on how local communities interacts with wildlife and participation to conserve the park. One FGD will conduct in each selected sample kebele. The group size in each focus group discussion will vary from people. In each FGD three community leaders, three elders of villages, two experts from the park, one from culture and tourism office of each district will select and discusses community participatory approaches to the park. FGD participants will select based on their age, knowledge about the area and duration of residency in the study area. Information collected from group discussion will summarize using a text analysis method.

## **2.5 Analysis**

Data will be analysis by Statistical package (software) SPSS version 23. Descriptive statistics will use to describe respondents' socioeconomic information and participatory practice of community to the park. Additionally, it will use correlation and chi square model to know the relationship of community with national park as well as conservation status of community to the national park. A one-way ANOVA will use to understand whether both large mammal and avian species relative abundance and richness differed among the different habitat types. The mean richness and relative abundance values will make by pooling the records based on the separate observations on each habitat type. Shannon-Weiner Index and Simpson Index will use to evaluate the diversity and abundance of large mammal and bird species in different habitats within the study area. It will be also analysis by graph, percent table or chart based on the collection of information from respondent.

## **3. EXPECTED OUT PUT**

After achieved this project it will expect the following things;

- ✓ After identified potential wildlife resource, it may create job opportunity to the local community
- ✓ It creates linkage between indigenous knowledge with national park
- ✓ It led to Increase the participatory practice of community to the national park and equitable sharing of benefit from the park
- ✓ It makes local community as decision makers and problem solvers as well as responsible to carry each activity.
- ✓ Community have use resource in sustainable way without affecting coming generation.
- ✓ Community will develop integrative work with other stakeholder, NGO ang governmental organization.
- ✓ It will develop bottom -up strategy and model for other national parks.

## 4. WORK PLAN AND BUDGET

### 4.1 Work plan

**Table 1 work plan of the activities**

No.	Activity descriptions	Time plan (August 2021- June 2022)											
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
1	Preliminary survey				XX								
2	Literature review		XX	XX									
3	Preparation of questionnaire for community				XX								
5	Organizing the collected data					XX							
9	Data analysis					XX	XX						
10	Write up, submission and subsequent modifications of thesis							XX	XX				
11	Final submission and thesis presentation									XX			

### 4.2 Budget

**Table 2 Transport cost**

No	Item	Unit	Quantity of tour	Unit cost/birr	Total cost/birr
1	Transport cost	Litre	600	23.50	14,100
	Car rent	2		30,000	60,000
	Sub total				74,100

**Table 3 personnel expense/allowance/**

No	Budget category	persons	Duration (days)	Perdiem	Total cost/birr
1	Advisor	1		15,000	15,000
2	Field assistant	2	10	400	8,000
3	Data collectors	2	12	300	7,200
	Subtotal				30,200
	<b>Personal expense (my -self)</b>	Day	Amount		Total

1	Data collection(researcher)	50	400 60	750	20,000	18,000
2	Food and house allowance	50	500birr/day		25,000	
Sub-total					45,000	

**Table 4 Field equipment**

No.		Unit	Quantity	Unit price	Total price/birr
1	Hand torch, high power torch	Number	3	9500	28,500
2	Camera, GPS, Compass		3	9000	27,000
Subtotal					55,500

**Table 5 office supply cost and material**

No	Item	Unit	Quantity	Unit price	Total price/birr
1	Field note book	Number	30	50.000	1500
2	Print service	Number	2000 pages	5.00	10,000
3	Pen	Number	30	15	450
Sub total					11,950

**Table 6 Budget summary**

No.	Cost description	Subtotal cost/birr
	Transport cost	74,100
1	Personal cost of helpers	30,200
	My personal cost	45,000
3	Equipment cost	55,500
4	Office supply cost and miscellaneous expenses	11,950
6	Total cost	216,750

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If you say yes please write how.....

**IV. Pleases choice and make circle your answers;**

- 6. What are the potential wildlife resources in Gambella national park?  
A. Mammals            B. bird            C. reptile    D. amphibian    E. plant
- 7. What benefit gain local community from the national park  
A. It creates job opportunity  
B. Income  
C. Ecosystem service  
D. Other please list.....
- 8. Why community have not more initiated to conserve national park  
A. Lack of community-based approach  
B. Lack of benefit gaining for the park  
C. Lack of community-based policy  
D. Conflict of interest to use resource  
E. Other.....  
.....
- 9. Which one of the following is the most challenge which affects the national park and CBC success  
A. Human population growth    B. pollution    C. overexploitation    D. human wildlife conflict  
E. Conflict of interest    F. other.....

**II. Pleases explain your response in the below question;**

- 10. Do you think any community conservation activity for the sustainable of national park?  
.....  
.....  
.....
- 11. What challenges have existed when community did not more participate to the conservation.....  
.....  
.....
- 12. How the natural resources of the park are regulated? Is it feasible for long term sustainable use? Does it communities collaborated with other organization?
- 13. How the park officials deal with the community at times of conflict interest over resources.    e.g Firewood Collection, Grazing, etc in the park?
- 14. How do you describe the future relationship of the community`s Livelihood with park?

# CURICLUM VITAE

## Personal information

Name Chalachew Alemneh Yenew  
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## Education Information

2017-2019 Wolkite University, degree course Bachelors of Science in Wildlife and Ecotourism Management

Title of final thesis --- potential tourism attractions and their challenges of community based ecotourism development in Awi zone ;in the case of lake Zengena

Final Grade:A

2020-2021 Wondo Genet College of Forestry and Natural Resource, for the degree of Master of Science with specialization in wildlife ecology and conservation

## Work Experience

2019/2020 one year as Graduate Assistant Lecturer in Wolkite University

## Languages and skill

Amharic-native speaker English –fluent in language and writing Awigna –basic

Basic skills of MS- word, Ms-Excel, QGIS and Ms-power point,

## Research experience

1. Chalachew Alemneh .2019. potential tourism attractions and their challenges of community based ecotourism development in Awi zone ;in the case of lake Zengena.
2. Chalachew Alemneh. 2020.review on impact of invasive alien plant species in Ethiopia