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Wild Animal Status and their Threats in Echefa Forest and Wetland (Proposed In-situ Conservation Site), Southern Nations Nationalities and People's Regional States, Ethiopia

Mengistu Wale[*], Abeje Kassie, Weldemariam Tesfahunegny and Gebregziabher Hailay

Ethiopian Biodiversity Institute Addis Ababa, Ethiopia

[*]**Corresponding author:** Mengistu Molaliegnwale, Ethiopian Biodiversity Institute Addis Ababa, Ethiopia, E-mail: mengw2004@yahoo.com

Abstract

Assessment of wild animal diversity and their threats was carried out from April 2017 to December 2018 in proposed in situ conservation area 'Echefa forest and wetlands', which is adjustment to Kaffa Biosphere Reserve, Southwest Ethiopia. Data were collected using semi-structured questionnaire through interview of selected 112 local communities, focus group discussion and direct observation. The data analyzed using descriptive statistics. A total of 146 wild animals, 24 mammals, 70 bird species, 22 herpetofauna and 30 insect species were identified. However, the wild animal resources declined 99% in the last twenty years due to illegal hunting 68.8% followed by habitat loss 22.3%. About 87.5% of the communities have both negative and positive attitudes towards wild animals in the area. The negative attitudes might be linked to high human wild animal conflict 84.8%. Despite the communities were voluntary to participate in conservation, the wild animal are not properly conserved in Echefa wetland and forest. Therefore, establishing a new proposed in-situ conservation site for legal protection is recommended.

Background and Justification

Ethiopia is one of the wild animal potential countries in Africa. The diverse habitat and variable topography and climate condition of the country have contributed to diversity of species of mammals [1]. The country currently possesses 320 species of mammals [2], 926 species of birds, 242 species of reptiles, 73 species of amphibians and more than 4693 species of insect. Recent compressive study of by [3] reduced to the total mammal to 311 species in Ethiopia. Of these 55 mammal, 24 bird, 19 reptiles, 30 amphibians and 23 insect species are endemic to the country [3,4].

However, wildlife resource in Ethiopia has been diminished over the past century both in amount and distribution due to the expansion of human settlement, agriculture that lead to habitat destruction, illegal hunting, poaching and land degradation due to overgrazing and other factors [2,5]. As habitats, altered untold numbers of species are disappearing before they have been recognized, or even studied. The natural habitat ranges of many wild animal species and their population size in Ethiopia have become smaller and smaller in alarming rate for a century.

For instance, the forest cover of Ethiopia declined from 47% to only 3% [6,7]. The country has been losing about 92,000 ha (0.54%) of forest annually between 2000 and 2013 [8] though; recently, there is gradual rise through rehabilitation. Unlike the forest, cover presumed to be raising the wild animal status is still in question. In addition, the Ethiopian highlands are among the most densely populated agricultural areas in Africa [9]. This in turn has led to the formation of many forest fragments in most part of Ethiopia. As a result, the populations of wild animals are forced to occupy isolated habitat areas that are often found in National Parks [10,11].

The study of the species richness, endemicity and rarity across geographical areas is essential to select the best places for conserving biodiversity [12], besides wild animals are not evenly distributed throughout Ethiopia, instead vary in abundance, composition and these aspects are also not well documented [5] even untouched in outside protected areas.

Ensuring the survival of population of certain species and ecosystem has a critical impact on food security and livelihood of the local community. Realizing this, many countries have established protected area to conserve the wild animal population and their habitat. Ethiopia is a signatory party of the Convention on Biological Diversity (CBD) thereby, has been undertaking efforts in biodiversity conservation. In line with this National Biodiversity Strategy and Action Plan of Ethiopia [4], Target 7 states, by 2020, area coverage of ecologically representative and effectively managed protected areas is increased from currently 14% to 20%. One of the implementation strategies for this is by establishing additional ecologically representative protected areas that are rich in wildlife.

Assessment of new potential wild animal areas is critical to provide basic information for setting up conservation areas and recognized the status of wild animal population [13]. However, identifying the significance of wild animal potential habitats that exist outside protected areas in maintaining diverse groups of wild animal species in Ethiopia is poorly understood [9] as result wild animal species are becoming locally extinct due to rapid increased anthropogenic activities. Therefore, study was carried on diversity and threats of mammals, birds, herpeto-fauna and insects and to proposed a new wild animal in situ conservation area.

Objectives

- To identify wild animal species, their threats and proposed in situ conservation area

- To identify wild animal species found in Echefa forest and wetland
- To identify the major wild animal threats in the Echefa forest and wetland
- To proposed wild animal in situ conservation area

Methods and Materials

Description of the study area

The new proposed in situ conservation area (Echefa forest and wetland area) (Figure 1) is located in Southern Nations Nationalities and People's Regional State (SNNPRS) bordering by Keffa and Sheka zones.

Figure 1: Map of proposed conservation area (Echefa forest and wetland area).
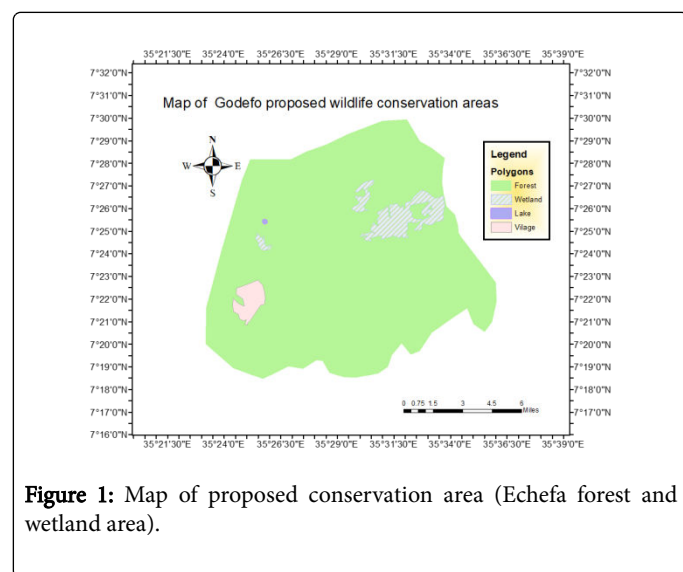
The majority of the proposed conservation site is located within Bita Woreda of Keffa zone. It bordered by Bita woreda in the East, Anderacha woreda by north, Yeki woreda by South, Anderacha, and Tepi-Masha road by West. The kebeles bordering the site includes Washiro, Hamani, Gerecho-geneti and Sota kebeles from Bita woreda, Depi from Yeki woreda and Yokochieti from Anderacha woreda. The so-called government forest is incorporated within proposed conservation site, which is located near Depi kebele. The proposed conservation site extends about 23 km length and 21 km width having maximum height about 2760 m at the edges of the Crater Lake. The vegetation cover of the area is moist evergreen montane forest and wetland grass and bamboo forest (Figure 2).

**Figure 2:** Photo of Echefa Bamboo forest and wetland grasses.

Methods

Data were collected twice from April 2017 to December 2018. Assessment of wild animals found in the study area and their threats were identified using semi-structured questionnaire interview, focus group discussion and ground study (Figure 3).

Figure 3: Photo of some selected local communities for interview.

Selected local residents of the Godefo kebele were interviewed to investigate the presence of wild animals in Echefa wetland and forest focusing on household living closely with the study area with the help of field guides. In addition to the interview, presences of diurnal animal species were identified through direct observation by walking on foot in study area. Identification of nocturnal animals was done by indirect observation through droppings, footprints, scents etc by walking on the foot in the forest. Visual Encounter surveys and auditory survey methods were employed for amphibian species investigation. Even though amphibian and reptile visual encounter surveys can have a low probability of detection for many species, depending on the ecosystem and search effort; in the field investigation, Visual encounter surveys was used for birds, amphibians and reptiles by digging the expected habitat. Descriptive statistics in form frequency was used to analyze the data.

Results

A total of 112 local communities 22 females and 90 males were participated in the interview about 60.7% of them lived more than 20 years in the study area (Figure 4) and their main livelihoods is agriculture 94.6%. More than 146 species of wild animals were identified in the present study and using literature works. Of these 24 mammals, 70 birds, 22 herpetofauna and 30 insect species were identified and few were pictured (Figure 5).
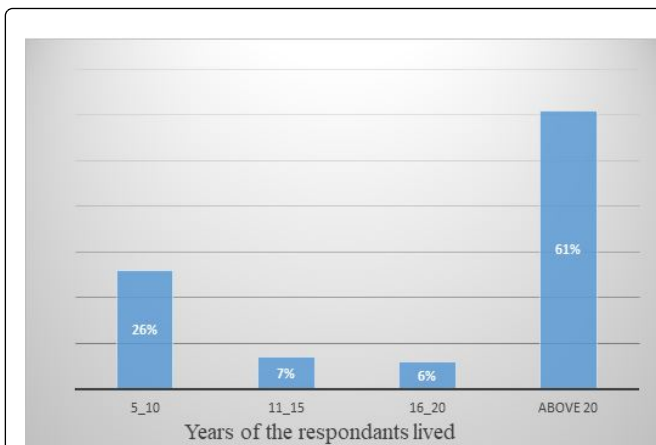
Figure 4: Proportion of respondents lived in the study area.

Figure 5: Photo of some wild animal species observed during the study.

The twenty-four mammal species belongs to 6 orders and 12 families while 70 bird species belong to 15 orders and 34 families. The most common mammals were bushbuck, Anubis baboon, Columbus monkey and Forest hogs. The flagship species in the area is African buffalo however, this species was seriously affected due to illegal hunting and only few droppings and footprints were observed during

the assessment in the bamboo forest. According to the local peoples, lions are seasonal in Echefa forest; it appears in-group of three up to four adults every dry season and attack livestock. The major threats of wild animals in the Echefa forest and wetland were illegal hunting, settlement and farmland expansion.

Though the study focused on wild animal species, the study area also harbors high diversity of plants species. The common plant species observed in Echefa forest and wetland were Bamboo (subfamily of Bambusoideae) which was the most extensive plant found in the study area, other grass families like Cyperaceae, Palm tree, Ficus sp, *Hagenia abyssinica*, *Podocarpus falcatus*, different fern species and others.

According to the respondents, there is no free access of natural resources (83.9%) by the communities; however, the trend of wild animal was declining with response rate of 99.1% in the last twenty years. The main reason for wild animal decline was illegal hunting, which accounts about 68.8% followed by habitat loss 22.3%. Not all the member of the community participated in illegal hunting, rather 84.8% hunters were reported few peoples from within the community. Among the wild animals that mostly affected by illegal hunting were African buffalo, followed by Common bushbuck 57% and 49% respectively.

More than 87.5% of the local community had both positive and negative attitudes towards wild animals. The main reason for positive attitudes of local communities towards wild animal was the use of wild animals for food source by the community while their negative attitudes was mainly due to crop raiding and livestock killing by wild animals. As result, there were high human wild animal conflicts (84.8%) mainly for crop damage, livestock killing and threatening human life by some carnivores.

Under slight controlled situation, 73% of respondent's reported that local communities mainly depend on fire and house construction, forage/grazing and bee keeping while other uses were negligible, in addition to agriculture for their livelihood (Figure 6).
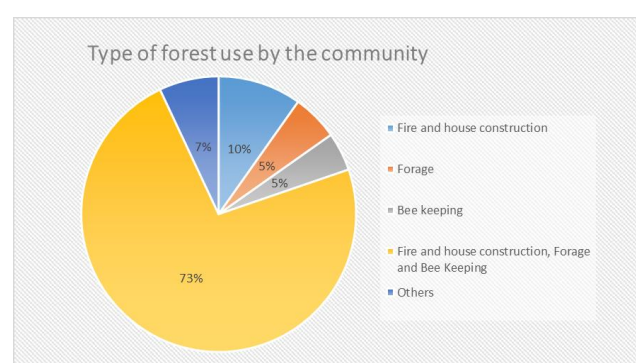
Figure 6: Proportion of forest use by the local communities.

About 72.3% of the local community responded that wild animals are not well conserved in the study area however; the communities were voluntary to participate in conservation of wildlife in the new proposed in-situ conservation site in future.

Discussion

Ethiopia is one of wild animal potential countries of the world. The wild animal species are more concentrated in the southern and

southwestern parts of the country. In this study at least 146 wild animal species of this 24 mammals, 70 Birds, 22 Herpetofauna and 30 insect species were identified in the proposed Echefa wetland and forest conservation area including other literature works.

Similar study by Berhan, In Kaffa coffee forest 294 animal species were identified of this 61 mammal, 210 birds, 10 reptiles, seven amphibians and six fish species. The figure in this study is slightly higher than the current study probable due to the current study focused on small area and relatively in accessible for assessment while the Kaffa coffee forest is extensive with different topography, climate and ecology which favors presence of more wild animal species.

About 99% of the respondents said that the trends of wild animals in the study area were declined. The result is in line with other study reported by Berhan, where (43%) wild animal declined, though there is variation in response rate. The reason why high response of decline in the present study is may be due to most of the communities treated wild animals as both harmful and important (87%) whereas in Keffa fauna status study they believed (85%) as wild animal important (Berhan). It is clear that more negative attitudes reflected in the communities towards wild animals more will be killed which intern lead to decrease in trend gradually.

The major cause of wild animal decline identified in this study was illegal hunting which accounts 68.8% followed by habitat loss 22.3%. This is in contrary to other studies in Keffa biosphere where major cause of wild animal decline was due to deforestation (60%) [14,15]. In the last four decades the landscape changed from forest dominated (73%) to non-forest dominated (32%) [16,17]. The reason why illegal hunting major cause is may be due to loss of habitat expose the animals to hunters [16]. The most commonly hunted animals identified in this study were Bovidae with response rate of 57%. Similarly, in other studies the most threatened wild animals were mammals 51% followed by Bovidae 26%. The reason might be mammals used for subsistence in individual households of the local communities

Berhan, reported that the main cause of wildlife conflict was crop damage 51% followed by livestock killing 25%. The result is in line with present study that shows very high human wild animal conflicts 84.8% was mainly due to crop damage, livestock killing and threatening human life by some carnivores. The reason might be loss of habitat and gradually expansion of farmland into the remaining wild animal habitat resulted in scarcity of wild animal food [16] and forced them to utilize crops more frequently than before. In the study area 94.6% of community's livelihood depend on agriculture and under slight controlled situation, 73% of local communities mainly depend on forest for fire and house construction, forage/grazing and bee keeping in addition to agriculture for their survival. These accounts, loss of wild animal habitat which ends up with loss of prey to carnivores, intern leads to attack of domestic animals by wild carnivores and become root cause of human wildlife conflict in countries like Ethiopia.

Conclusion and Recommendation

The study site consists of huge Bamboo forest and Wetland grass and home of diverse wildlife species. However, the wildlife population is declining currently due to number of threats such as settlement, farmland expansion, bushmeat hunting and others. African buffalo and common bushbuck, which were common in the past, are now alarmingly declined in number by illegal hunting of community members for seeking meat. Local communities are voluntary to

participate in the conservation of wildlife if they get help from concerned bodies.

The study does not cover the entire area Echefa forest and wetland due to lack of logistics, short time schedules and in accessibilities of some sites. Therefore, farther comprehensive study should be taken to identify the diversity and abundance of all wild animal species found in the area. The area is surrounded by settlement and hence acts as refuges of wildlife reserve. Therefore, protecting this site is mandatory to save from local extinction of wild animals. Researcher prepares a proposed map of the conservation area though it needs consensus with local communities and other concerned bodies and demarcation at the ground level.

Acknowledgment

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