Final Evaluation Report

Your Details	
Full Name	Aemro Mekonnen Birhanu
Project Title	Distribution Pattern and Population Estimate of Hippopotamus (Hippopotamus amphibious) in Ethiopia.
Application ID	24783-1
Date of this Report	28 June 2022

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Distribution pattern			✓	We found a large number of hippos with a large area coverage throughout the country in six rivers (Omo, Awash, Blue Nile, Gibe, Baro and Akobo) and five major lakes (Abaya, Hawassa, Langano, Ziway and Chamo) and with three large wetland areas, Dhati-Welel National Park, Chebera Churchura National Park and wetland between Jimma-Illibabour in particular along sides of Gojeb River
Population size			✓	A total of 3830 hippos were recorded at all counting sites over the entire study period, far more than reported by Lewison and Pluháček (2017) who estimated a total of 2500 individuals. Also with huge potential of wetland, there may be still large population of hippos which is not covered yet.
Ecology of hippopotamus			✓	From the total behavioural activities, resting comprised the largest proportion that accounts 38.89% followed by walking (27.24%). Barking and yawning events spent 52.18% and 47.82% of their time, respectively. Males spent more time resting than females, while females were more active. Feeding and moving peak activities were observed early morning and late afternoon hours with resting peak during the mid-day. Barking and yawning events mostly increased during the afternoon both in male and female hippopotamuses. Hippopotamus consumed a total of 40 plant species in CCNP. Of these, *Eriochloa fatmensis* (11.68%), *Typha latifolia* (9.91%), *Echinocloa pyramidalis* (9.59%) and *Cynodon dactylon* (8.45%) were the top four species of plants that contributed 39.63% of their overall diet

Human hippopotamus conflict				From the questionnaire survey, 36.4% of respondents had negative attitude towards hippopotamus, while 55.9% and 7.7% had positive and neutral attitudes, respectively. Crop raiding, livestock damage and overgrazing were the major problems encountered resulting in conflict between human and hippopotamus in the study area. A total mean of 137 kg per household with a mean total cost estimation 1883 Ethiopian birr ($70) were lost due to hippopotamus. Prohibition of expansion of human settlements, awareness creation programme and participation of the local people for future conservation of the area is recommended.

2. Describe the three most important outcomes of your project.

The main outcomes of our study are as follows:

a). We determined population size. The results from this study are very crucial as its sound effect on the population estimate of hippos in Ethiopia unlike the previous estimate of 2500 individuals however, we have found 3380 individuals which is a new information on the population size of the country.

b). We evaluated the distribution of common hippopotamus in different Ethiopian lakes, rivers and wetland habitats (buffer and core).

c). We determined the ecology and feeding behaviour of common hippopotamus in the Ethiopian water bodies which is crucial in conservation of the species.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

Though we were successfully completed our objective, one difficult issue during our study of common hippopotamus using transect were, arose from the coverage of the area as the project covers the major lakes, rivers and wetland area of Ethiopia. However, we tackled the problem by pre-warning the community what we do the in the area as of using by supplemented questioners.

The willingness of the fisherman to collaborate in the project as they need per diem to give detail information.

Some area assessment needs aerial survey, as a boat does not reach some difficult area and most of the hippos are active at night.

4. Describe the involvement of local communities and how they have benefitted from the project.

The involvement of local community is a key component for the conservation of species. Local community, including fishermen, are knowledgeable on the biodiversity around them from their daily routines, and it will be wise to start having insight on the hippopotamus presence/ absence and distribution by interviewing the local community. As result this project were done by questionnaire and interview with local community, and they were benefited from the project as they change their attitude towards hippopotamus as they were as enemy rather than as asset also, they got experience from the project leader and even though it is not life changing somehow the assistant got per diem for their daily life.

5. Are there any plans to continue this work?

Yes, I will work effectively on the conservation status and the legal framework to manage this species and the wetlands and water bodies of Ethiopia which support this vulnerable species and other critically endangered species also, would like to continue to work on biodiversity conservation and research in Ethiopia focusing on little known mammals of including my current project on *Hippopotamus amphibious*, Senegal bush baby (*Galago senegalensis*) and otter species of different types. I am currently training on different research tools including GIS based habitat suitability modelling, R based statistical analysis and behavioural ecology techniques which will be helping to achieve my goal. Understanding on distribution pattern and habitat use are the major baseline data for any conservation effort of the currently declining wildlife species of the country. Hence, I would like to build my career research focused on such issues

6. How do you plan to share the results of your work with others?

I will publish my findings to a good scientific journal either *Oryx* or *Animal Conservation* depending on the novelty of my findings. I also will publish some of the materials which will not go to scientific journals to the IUCN newsletter *Suiform Soundings*: Newsletter of the IUCN Pigs, Peccaries and Hippos Specialist Group and results of this study will be widely shared with the policy makers and decision-making authorities to implement conservation measures. Most importantly, we will share outcomes of the study with the local community by conducting community workshops and audio-visual presentations and through the local media.

7. Looking ahead, what do you feel are the important next steps?

The next main achievement of this project will be determined on the quality of the publication out of this project its availability to both national and international organizations working on conservation.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes, we used all presentation undertaken, and RF will be acknowledged in all the upcoming publications and conference attended.

9. Provide a full list of all the members of your team and their role in the project.

Professor Afework Bekele from Addis Ababa University (AAU) is my project supervisor in Ethiopia. Professor Afework was help in designing details of the study plan and writing up of the papers.

Professor Nils Chr from University of Oslo was my collaborators. Professor Nils was mainly involved in the detailed designs of the methods and analysis and his several experienced postdocs were helping me in every aspect of the analysis.

Dr. Anagaw Atickem was involved in all aspects of the project including designing details, Analysis the data and providing logistic material.

10. Any other comments?

My work was not done effectively and successfully without the support of RF and hopefully will make my project to end and lead forward on the conservation of this vulnerable species. We also acknowledge the foundation for the conservation initiatives around the world.