

Final Evaluation Report

Your Details	
Full Name	Mebrat Teklemariam Gebrekidan
Project Title	Effects of Land Use Land Cover Changes on Population Dynamics and Feeding Ecology of Lesser Flamingo (<i>Phoeniconaias minor</i>) in Chelekleka Wetland, Ethiopia
Application ID	35814-1
Date of this Report	15 July 2023

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
Estimation of Lesser Flamingo population size in Chelekleka wetland				The population size of the species was estimated, and a manuscript is submitted to <i>Wetlands</i> journal for publication.
Identification of the limnological parameters of the wetland				Physicochemical characteristics of the wetland and phytoplankton, zooplankton and macro- invertebrate diversity measures were identified. I prepared manuscript to be submitted to <i>Freshwater Biology</i> journal for publication in which it is under review by my supervisors.
Investigation of Lesser Flamingos feeding behaviour in Chelekleka wetland				The potential prey of lesser flamingo, feeding techniques and their feeding interaction were investigated. I will write the paper this year, acknowledging Rufford's support.
LULCC detection and identification of its impacts on Lesser Flamingos population dynamics in the project area				Digital LULCC of the wetland was sensed to identify its effect on lesser flamingo population dynamics.
Community education, wildlife protection club organization				A detailed discussion on the threats and future fate of the species and the wetland was conducted with community representatives (farmers and farm investors). In addition, wildlife protection clubs were established in three schools found in the surrounding of the wetland. However, a 2-day workshop focused on "Improving Capability and information sharing for enhancing conservation of wildlife and Chelekleka wetland" proposed to be held at the end of June 2023 has been postponed to mid-August 2023.

			<p>Targeted groups of the workshop are representatives of local community (schoolchildren, farmers, elders and religious leaders), farm investors on the fringe of the wetland, delegates of relevant governmental and non-governmental institutions.</p> <p>A field visit to the wetland is planned on the 2nd day of the workshop (all participants of the workshop will be cordially invited).</p>
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2. Describe the three most important outcomes of your project.

a). We have identified a maximum of 963 lesser flamingos that visited Chelekleka wetland, mainly during December 2021 to February 2022. In addition, we investigated the temporal population variation of the species was affected by changes in its water content, physicochemical characteristics of the wetland, species richness and abundance of the potential prey of lesser flamingo (phytoplankton, zooplankton and macroinvertebrate).

b). The wetland is alkaline, and the physicochemical characteristics fluctuated monthly within a range that was conducive to high biological productivity. We have identified diversified taxa of phytoplankton (83 species), zooplankton (42 species) and macroinvertebrates (28 families) that varied monthly in response to the changes in physicochemical parameters of the wetland.

c). Lesser flamingos actively forage during morning and evening hours using mostly treading, mud dredging and filter-feeding foraging techniques. The species shared feeding grounds with the flocks of greater flamingo in the wetland.

d). The wetland is shallow and seasonally inundated, and it is ecologically important as a foraging site for lesser and greater flamingos. Flamingos forage in the wetland during the dry season in which water transparency was high and abandon it following the complete dryness of the wetland during March 2022.

e). We have investigated the conservation threats to lesser flamingos and the Chelekleka wetland. Consequently, we have helped to improve awareness about significance and conservation of lesser flamingo and wetland in the study area. Furthermore, we are organising a workshop for improving awareness of the local community and information sharing with the responsible stakeholders.

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

i. Due to the restricted internet access in Ethiopia, it was difficult to download satellite remote sensing images as per the plan to detect LULCC of the wetland. We have resolved by collecting the digital satellite images through

flash disc from Dr. Bezawork Afework's colleague working abroad who had access to download it.

- ii. Another difficulty was the financial and time constraints to hold the capacity improvement and information sharing workshop on time. I facilitated and got a promise from Addis Ababa University, Ethiopian Wildlife Conservation Authority and Ethiopian Wildlife and Nature History Society for funding and holding a collaborative workshop from June 24-25, 2023, at Bishoftu town, Ethiopia. In Ethiopia, every fiscal year terminates in June in which officials of the above organisations were busy and unfortunately diverted the proposed budget to perform other activities. We postponed the schedule and reached at consensus with the organisations to cover the workshop costs from the 2023/24 fiscal year.

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

i) Community education: We have improved the awareness of local community on the values and sustainable utilisation of lesser flamingos and the wetland through school visits and wildlife protection club organisation and discussions with the public. The charismatic nature of flamingos, diversity of birds (246 species) and the attractive landscape of the wetland are among the potentials of ecotourism activities in the study area. Thus, this environmental education is crucial to practice community-based ecotourism activities.

ii) Job opportunity and capacity building: Both the local field guides and field assistant were hired from the surrounding community during the fieldwork of the project period. In addition to the allowance payment, they have been exposed to research techniques, and grasped a significant experience in field data collection and bird identification and counting skills. This is important for get involved in further projects and conservation activities.

5. Are there any plans to continue this work?

Yes. I began this project for my doctoral studies in Addis Ababa University, Ethiopia. I have accomplished my study and 1st September 2023; I will join my employee institution (Wolkite University). My passion and being an academic staff of Wolkite University is a great opportunity for me to continue my effort on monitoring and conservation intervention of the threatened lesser flamingo and highly degraded Chelekleka wetland. I will expand the environmental education activities to increase eco-minded generation in the project area.

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

The results of this work have been and will continue to be shared with others via the following ways:

- (i) **Scientific publications in reputable peer-reviewed scientific journal:** One manuscript has been submitted for publication and a draft manuscript has

been prepared so far. We visualise a further three manuscripts of this work will be prepared and submitted over the next 6 months where the foundation will be acknowledged.

- (ii) **Social media accounts:** I have been posted the overall progress of my study on LinkedIn and Facebook. I will keep sharing the outputs of this project via ResearchGate and Twitter.
- (iii) **Community education:** I did public discussions with local community, school visits and wildlife protection club organisation.
- (iv) **Workshop/Conference:** I presented the results of this work for the whole Addis Ababa University community in its annual research week held every year in May (16 May 2023). I also had a public defence of my dissertation for communities of my campus (College of natural and Computational sciences) (22 May 2023). I also presented the results of this work to staff and students of Centre for Ecological and Evolutionary Synthesis, University of Oslo, Norway (14 December 2022). In addition, I will also present the results of this project in the upcoming workshop which is supported by Addis Ababa University, Ethiopian Wildlife Conservation Authority and Ethiopian Wildlife and Nature History Society.

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

In-situ species conservation might have a great role in sustaining the target species, the habitat and its life forms. Additionally, involvement of local community in conservation practices might enhance the effectiveness of conservation implementation. Thus, I hope I will be engaged in monitoring and conservation intervention activities and environmental education to improve the conservation status of the species and its habitat and bring positive attitudinal changes about the significance of lesser flamingos and wetland and wildlife in general. Since the study area is unprotected Important Bird Area under critical threat, I will contribute my role in designating the area to community based conservation area.

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, I used the Rufford Foundation logo in acknowledgement's sections of my:

- ✓ Dissertation public defence.
- ✓ Oral presentation to Addis Ababa University annual research week in which I was awarded a certificate for best presentation.
- ✓ presentation on Centre for Ecological and Evolutionary Synthesis, University of Oslo University of Oslo, Norway.
- ✓ Presentation at annual conference at one campus of Addis Ababa University.

I will also use the Rufford Foundation logo in the coming presentations including the upcoming workshop to be held at Bishoftu town (the project area).

I have been and will be acknowledged the valuable support of the Rufford Foundation in my dissertation, reports as well as manuscript submitted and will be submitted for publication in reputable peer-reviewed scientific journals.

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

We all the team members of the project are from Addis Ababa University, Ethiopia.

Mebrat Teklemariam Gebrekidan, the project leader; was engaged in planning and conducting all fieldwork, managing databases, conducting analyses, writing up drafts of dissertation, manuscripts and reports.

Professor Afework Bekele: - supervised and assisted the project activities such as ecological survey design and data collection techniques and commenting on the draft dissertation and manuscripts.

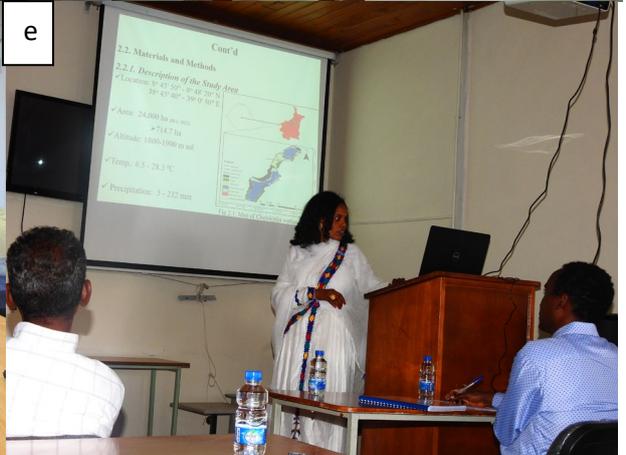
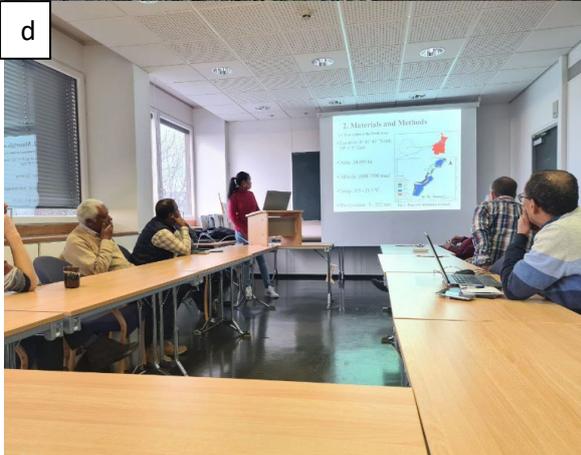
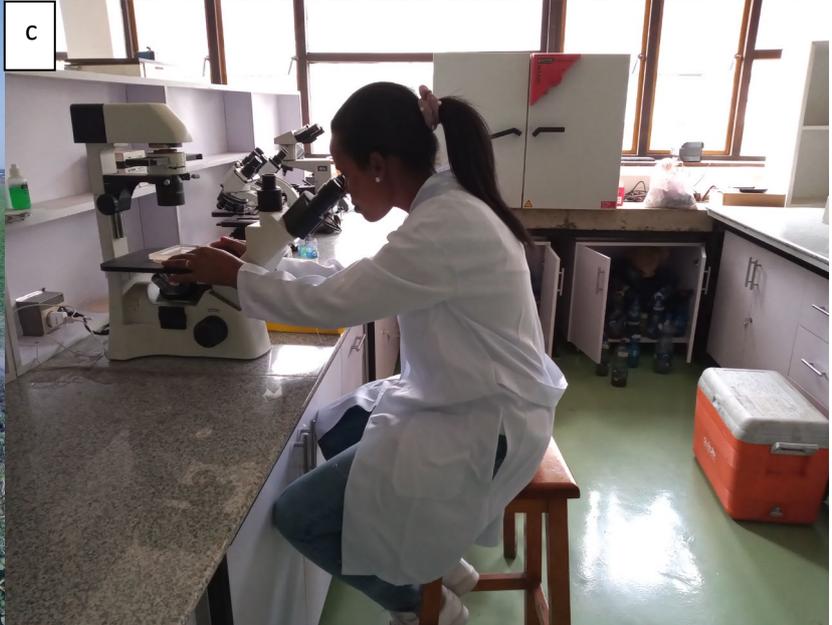
Bezawork Afework (PhD): She was aware of all work and engaged in supervision, motivation, follow-up, research design and field techniques and commenting drafts of dissertation, manuscripts and reports. She encouraged me to attend national and international short-term exchange programmes.

On behalf of the Addis Ababa thematic project, both my supervisors provided some of the funding for the project.

10. Any other comments?

We are very grateful to The Rufford Foundation, Ethiopian Wildlife Conservation Authority and Addis Ababa University for their crucial support, without which this work would not have been successful. My gratitude extends to IDEA WILD, Wolkite University and Addis Ababa University for the support of research equipment. Also, much appreciation goes to the Erasmus + mobility program at Technical University of Cluj-Napoca, Romania, Norwegian Partnership Program for Global Academic Cooperation at University of Oslo, Norway and African Center of Excellence for Water Management at Fisheries and Aquatic Life Research Center, Sebeta, Ethiopia for providing fund to participate in the short-term student exchange programmes.

I have learned a great deal and am more passionate about birds (especially flamingos), wetlands and their sustainable utilisation. We plan to continue and expand our work and look forward to getting future support from the foundation as well.



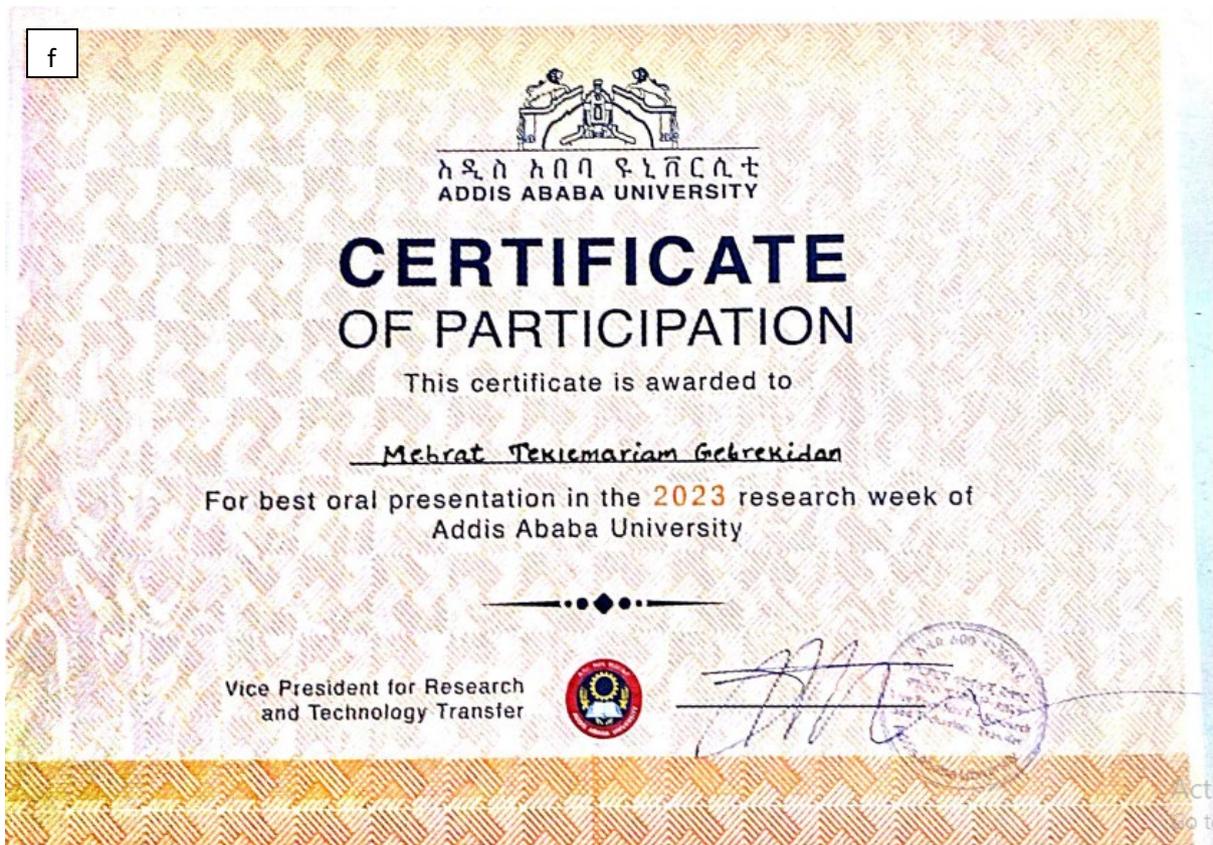


Figure 1: A piece of information on the activities of the project (a) flock of Lesser and Greater flamingos (b) field data collection at the project area (c) Lab analysis for the limnological parameters of the wetland (d) sharing the results of the project at University of Oslo, Norway (e) public dissertation defence at Addis Ababa University, Ethiopia and (f) an award for my best oral presentation on the results of this work to the community of Addis Ababa University during the 2023 research week.