Final Evaluation Report

Your Details	
Full Name	Florence Godfrey Tarimo
Project Title	Conservation initiatives to protect the vulnerable common hippopotamus (*Hippopotamus amphibius*) in Lake Manyara and Babati, northern Tanzania.
Application ID	39391-1
Date of this Report	21/12/2024

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
Survey and mapping of habitat conditions that are preferred by hippos around Lake Manyara and Babati areas				To assess habitat conditions preferred by hippos in Lake Manyara and Babati, vegetation surveys were conducted. At Lake Manyara study site we established two transects across each of three wards (Mto wa Mbu, Esilalei, and Nkaiti) making a total of six transects (Figure 1). At Lake Babati study site we established one transect across each of six wards (Bagara, Babati mjini, Nangara, Singe, Bonga and Duru) making a total of six transects (Figure 1). Along the transects, 1m × 1m plots were established at 100–150m intervals, perpendicular to the shoreline. Data collected herbaceous species composition,

				and cover percentage areas across wet and dry seasons at two sites (Figure 2). During the dry season, no new plant species were observed, as the focus was on herbaceous species therefore only the dried remains of some species recorded in the wet season were present. Results revealed dominant species, including *Cynodon dactylon* and *Sporobolus spicatus* at Lake Manyara site while *Cynodon dactylon* and *Cyperus rotundus* were dominant at Lake Babati site. We also identified and mapped human-hippo conflict hotspots in the study sites (Figure 3)
Evaluating the level of community awareness of hippos on their conservation importance				Structured questionnaires were administered to 50 and 60 households around the Lake Manyara and Lake Babati sites, respectively. For Lake Manyara, communities involved were Fishery, crop growers and livestock keepers. For lake Babati site, communities involved were crop growers and fishery.

				Community awareness of hippos and their conservation significance varied across the study sites. In Lake Manyara, 70% of respondents demonstrated awareness of hippos, with their knowledge primarily derived from personal experiences in farming, pastoralism or fishing. Awareness of their conservation importance was limited to few fishermen who recognized their ecological roles, in maintaining fish populations while crop growers communities most viewed hippos as a problematic animal due to crop destruction and human injuries. In Lake Babati, 90% of respondents were aware of hippos. Awareness of hippos' ecological contributions was generally limited among fishermen who acknowledged their conservation importance, highlighting their role as fish refuges or potential contributors to tourism (Boating and Hippo view at lake Babati). Overall, the findings revealed significant gaps in understanding the conservation importance of hippos across different

				communities at both sites.
Evaluating perceptions of communities about the hippos and their knowledge about the local human hippo conflict mitigation approaches				Through structured questionnaires administered to households around Lake Manyara and Lake Babati, we assessed the community perception of hippos and their knowledge of existing conflict management practices. For Lake Manyara, communities involved were Fishery, crop growers and livestock keepers. For lake Babati site however communities involved were crop growers and fishery communities. For crop growers communities, perceptions of hippos revealed predominantly negative attitudes as they perceived hippos as problematic species due to crop destruction and safety threats. They expressed resentment, often advocating for hippo relocation. Fishery communities, however demonstrated a more balanced view, recognizing both the challenges of HHC (fishnet

				damage and safety threats) and the ecological benefits of hippos (refuge for fish). Crop growers communities in both Lake Manyara and Lake Babati study sites were predominantly aware of various local mitigation practices to address human-hippo conflicts (HHC) and they are the one who practice on the ground. Such practices include (i) fencing (i.e. -vegetative fences using *Agave visalana*, *Euphorbia tirucalli* (Figure 4) -thorny branches; or -barbed wire) see Figure 5) (ii)digging ditches (Figure 6), and (iii) guarding using scaring methods i.e. shouting banging tins, and lighting fire (Figure 7). Digging ditches around the farm were practice only in Lake Babati site and proved to be effective particularly during dry season. During project feedback workshop we introduced it to

				crop growers communities around Lake Manyara. The effectiveness of these methods varied, with most respondents acknowledging their limited ability to prevent conflicts (except ditches), especially during the dry season when hippos venture further for forage. Economic constraints on the other hand limited willingness to explore alternative crops or establishing permanent fences around their farms. The findings suggest a need to focus on collaborative conservation education, incentivizing non-preferred crops, restoring hippo foraging areas and piloting innovative conflict mitigation strategies like community-managed buffer zones.

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

a). Through transect-based field surveys, we identified key habitat conditions for hippo conservation (vegetation cover and plant species around Lake Manyara and Babati. This knowledge provides a foundation for habitat management strategies to conserve hippos.
b). We assessed community awareness of hippo conservation, gathering insights from farmers, livestock keepers, and fishermen. This revealed existing knowledge, highlighted awareness gaps, and provided a baseline for targeted conservation and education programs to strengthen community support for hippo conservation and ecosystem protection.
c). We explored community perceptions and existing HHC mitigation strategies, using these insights as the basis for tailored interventions. During the feedback workshop, based on their socioeconomic status, we demonstrated enhanced HHC mitigation techniques to representative community members, including collaborative routine guarding, constructing live fences, and digging protective ditches around farms (Figure 8). By empowering these participants, we established a network of local champions dedicated to disseminating improved mitigation knowledge within their communities, fostering sustainable coexistence with hippos

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

- Community mistrust of conservation efforts;
  Some community members were sceptical of the project, fearing wildlife would be prioritized over their needs. To build trust, local leaders and local community representatives were engaged in all project phases, ensuring community concerns were addressed. Participatory approaches fostered collaboration and strengthened the community's confidence in the project's objective.
- During the feedback workshop at Lake Manyara, we proposed introducing ditches around the farms as a mitigation strategy for human-hippo conflicts (HHC) during the demonstration. However, the soil in the area was softer and less firm than expected, combined with a high-water table making the ditches less effective compared to those at Lake Babati. As a result, we recommended combining ditches with live vegetation fences to improve their effectiveness.

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

- The project actively involved local communities from the start, as we engaged key stakeholders, including village leaders, conservationists, and local communities (crop growers, livestock keepers and fishermen), to create a collaborative foundation. Community input was vital during field surveys and interviews, where they shared valuable insights about human-hippo conflicts, hippo behaviour, and their interactions with the environment. Through feedback workshops, we introduced improved mitigation strategies, like constructing live fences, collaborative digging of protective ditches, and

collaborative farm guarding. We also empowered local champions with the knowledge to share these techniques and foster sustainable coexistence.

- In return, communities benefited significantly. Many gained awareness of hippos' ecological importance, especially their role in sustaining fish populations and promoting biodiversity. By fostering a sense of ownership and collaboration, the project eased tensions and inspired some to explore new opportunities, such as tourism, tied to hippo conservation. Even though we were unable to monitor the effectiveness of the enhanced mitigation measures but remain hopeful that they have led to improvements.

5. Are there any plans to continue this work?

- Yes, building on the progress achieved, monitoring and refining the enhanced Human-Hippo Conflict (HHC) mitigation measures introduced during the feedback workshops is needed. This includes evaluating their effectiveness, expanding community training, and empowering local champions to sustain conservation efforts and explore opportunities for co-existence and a positive attitude towards hippo conservation. Further research needs to be conducted to deepen our understanding of hippo ecology and conflict dynamics, enabling the development of more targeted and practical interventions.
- Also, to promote coexistence, introducing incentive-based programs such as eco-tourism initiatives, will help communities recognise the economic and ecological value of hippos. Additionally, there is a need to collaborate with local authorities and stakeholders to advocate land-use planning that balances human needs with wildlife conservation. These efforts will ensure the project's sustainability in Lake Manyara and Babati and serve as a model for addressing similar challenges in other regions.

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

- Findings from this work will result in a new paper published in peer-reviewed journals, enabling other stakeholders to learn from and contribute to the conservation of the vulnerable common hippopotamus in Tanzania.
- Should financial resources become available, policy briefs will be developed and disseminated to policymakers to inform and guide decision-making.

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

- The next critical steps will involve strengthening the mitigation measures introduced during the feedback workshops. This includes monitoring their effectiveness, refining them based on community feedback, and expanding training programs to empower local champions in exploring co-existence mechanism and better land use planning. Collaborative land-use

planning with local authorities is vital to balance human needs with wildlife conservation, alongside efforts to restore hippo habitats and reduce resource competition.

- Also, on building community support by introducing incentive-based programs like eco-tourism which can help highlight the economic value of coexistence with hippos. Further research on hippo behaviour, conflict triggers, and climate-related challenges will enable more targeted interventions. These actions, combined with ongoing collaboration and knowledge-sharing, will ensure sustainable outcomes for both hippos and the communities in Lake Manyara and Babati.

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 featured The Rufford Foundation logo on our t-shirts and in our public presentations

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

1. **Professor Linus K. Munishi, (Supervisor)**
   - In this study, Prof. Munishi supervised the implementation of the project and guided on the methodological approach to collect the appropriate data.
2. **Emmanuel Mboya (Botanist)**
   - During this study, I worked with Mr. Mboya, a retired botanist with extensive knowledge and experience in plant species identification who assisted with data collection on vegetation cover and plant species in hippo-use areas.
3. **Mr. Kassim Kilungi (Field Ranger**)
   - I worked with Mr Kassim, a wildlife ranger at the Mto wa Mbu Game Controlled Area (GCA), who guided us through selected villages around Lake Manyara.
4. **Ms. Grace Rambau**
   - I worked with Ms. Rambau, the Babati District Council's Fisheries Officer. She introduced us to local authorities and guided us through the selected villages surrounding Lake Babati.
5. **Mr. ALPHAXAD DIAZ J, (Research Assistant)**

❖ During this study, I worked with Mr. Alphaxad as a research assistant. He helped with field data collection and data summative transcription. He holds a BSc. in wildlife science and conservation from the University of Dar es salaam (UDSM) in Tanzania and a year of research experience.

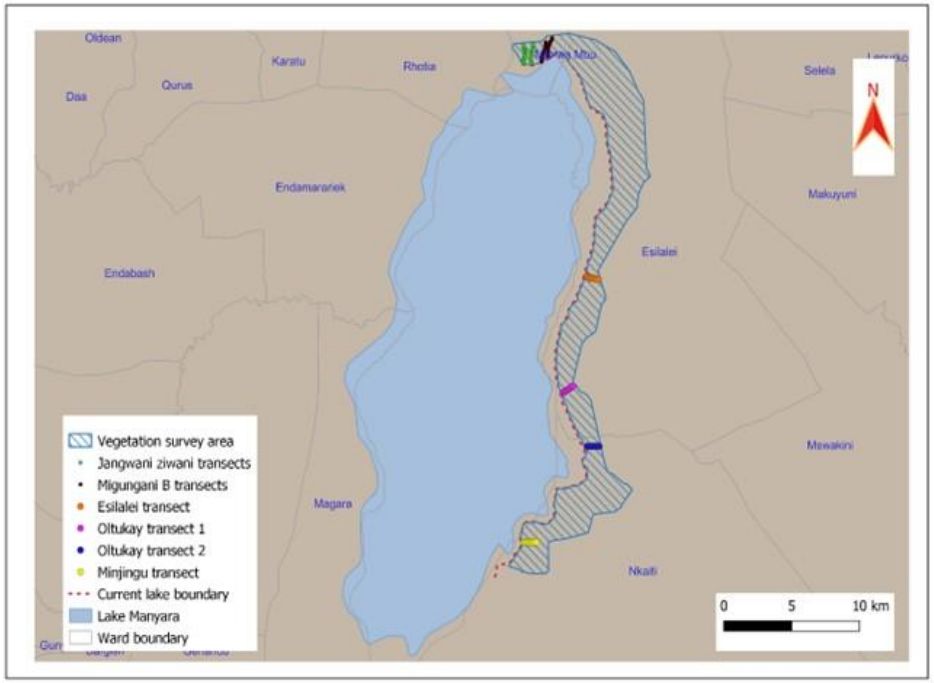
10. Any other comments?

- On behalf of the team, I sincerely thank the Rufford Foundation for funding our hippo project around Lake Babati and Lake Manyara. This project greatly benefited both local communities and my growth in my early career as a conservation scientist. Through this project, I developed crucial skills in project management and community engagement. Understanding the drivers of human-hippo conflict is essential for effective management, and I believe our findings, made possible by Rufford's support, will contribute significantly to both conservation science and improved coexistence strategies.

- Below, find the field attachments (Figures 1- 8)

Field attachments

Lake Manyara



Lake Babati

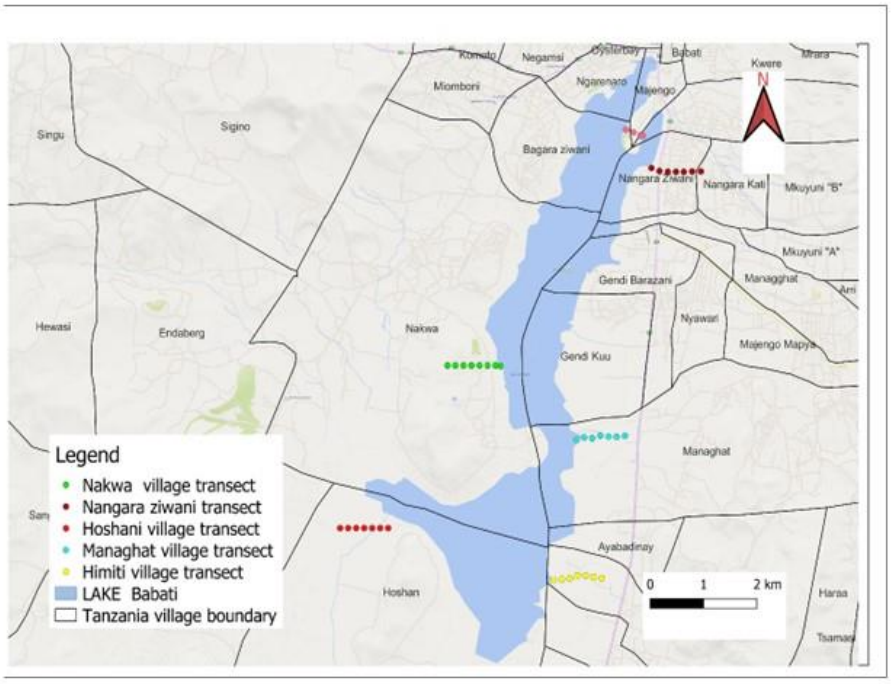


Figure1: Vegetation survey around lake Manyara and Lake Babati.

Figure 2: Vegetation survey and mapping

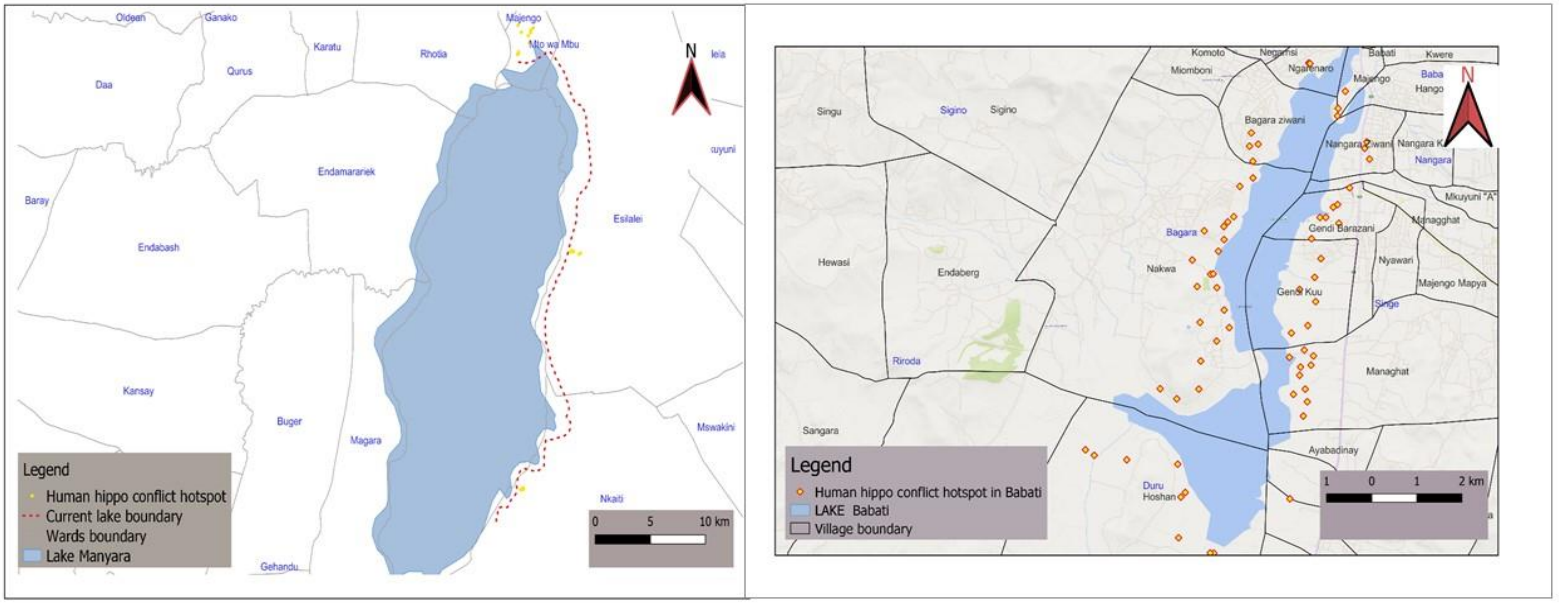


Figure 3: Conflicts hotspots around lake Manyara and Babati

Figure 4: Vegetative fence

Figure 5: barbed wire fence

Figure 6: Ditches around the farm

Figure 7: Guarding approach

Figure 8: community engagement in HHC mitigation strategies