

Final Evaluation Report

Your Details	
Full Name	Manase Elisa Pallangyo
Project Title	The impact of surface water availability and quality on physiological stress in large mammals in the West Kilimanjaro Ecosystem, Tanzania
Application ID	35493-B
Date of this Report	May 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
Examine the role of saline and mineral-rich water on physiological stress in large mammals in West Kilimanjaro				Well achieved and manuscript in preparation.
Mapping water-related large mammals stress levels across the West Kilimanjaro ecosystem				Well achieved and manuscript in preparation.
Assessing the current salinity levels in target water sources across the ecosystem				Well achieved and manuscript in preparation.

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

- a).** The project has managed to indicate the role of saline and mineral rich surface water on the physiological stress in large mammals in the West Kilimanjaro
- b).** The project has successfully mapped water-related large mammals stress levels in the West Kilimanjaro ecosystem.
- c).** The project has further assessed the current surface water salinity levels in the West Kilimanjaro ecosystem.

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

Effort for collection of quality animal samples (fresh faecal samples) and proper handling and storage of such samples, were underestimated. To ensure collection of quality samples, field work took longer time a day from early in the morning to night times. This allowed us to closely track groups of animals, without disturbing them, to collect fresh and quality dung samples. We had to carry iced storage equipment in the field, and we had to transfer the samples to the Zonal Veterinary laboratory in the same day right after field work for analysis, a condition that necessitated working even in the late nights.

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

A large part of the project was carried out in the local communities' west Kilimanjaro ecosystem. To ensure a successful project, local communities were involved before, during and after the fieldwork. Such involvement occurred mainly through their representative governments at village and ward government levels. Further,

members of local communities were consulted to share knowledge on the distribution and movements of the large mammals in the ecosystem. Such knowledge was used to plan for and guide our fieldwork in tracking and collecting animals dung samples. Feedback on the initial findings of the project was verbally communicated to the local communities through representative local governments in the West Kilimanjaro.

5. Are there any plans to continue this work?

Yes, there are plans to continue the work by studying changes in animal behaviours across the diverse ecosystem characterised by different quality and quantity of surface waters, forage and habitat availability, protection status and human influence. This study will also look on how such variations are affecting animal welfare and contribute to the growing human-wildlife conflicts, to suggest effective mitigation measures to improve animal welfare, reduce human-wildlife conflicts and contribute to sustainable development in the west Kilimanjaro ecosystem.

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

I am currently working on a manuscript that will be published in a peer reviewed journal where will be accessible to wider wildlife conservation communities at local and international levels. Findings of the project will also be communicated to local communities through respective local governments in the west Kilimanjaro ecosystem. Further, findings of this project will be shared with the relevant local wildlife and land management authorities, the government, presented at scientific conferences at either local/and regional levels.

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

We have so far gathered important information on the impacts of water mismanagement, poor quality and scarcity, and their impacts on the wild animals and livestock in the west Kilimanjaro ecosystem. However, it would be more meaningful to extend the scope of the study. This will entail a study covering longer periods of time and with broader components including among others assessment of the water related impacts and human influences on animal behaviour and human-wildlife conflicts. Outcome of this study will be informing formulation of realistic policy and management solutions for sustainable conservation and development in the ecosystem. It is important to start planning and carrying out of appropriate interventions to reduce the water related threats and contribute to the improvement of human livelihoods and animal welfare in the ecosystem.

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?

No materials have so far been produced, but the Rufford foundation logo will be displayed in all official communications including presentation of the findings in the local meetings and scientific conferences. However, the project has to some extent contribute to the publicity of the Foundation as the donor organisation for this

project, during introducing the projects to stakeholders including research and wildlife management authorities and the village governments at the preparations of the fieldwork, and the actual fieldwork in the ecosystem.

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

Dr. Manase Elisa Pallangyo- Led the project including participation in coordination and implementation of the all-project components.

Prof. Susanne Shultz- Worked as advisor of the project design, also assisted in laboratory work for the analysis hormone samples.

Dr Frank Alkado- vet expert and field assistant.

Kizota Mollel- Worked as an escort ranger and also as a local guide during the field work.

10. Any other comments?

I would like to express my gratitude to The Rufford Foundation for supporting this project. This has been a great work with great impacts for the conservation of the west Kilimanjaro ecosystem. I would kindly ask the foundation to continue supporting more project works in this ecosystem, as there are still gaps to address to realise the full potentials of the ecosystem in conservation and sustainable development.





Buffalo grazing near water in Arusha National Park.





Giraffes and zebra's drinking in man-made waterholes in West Kilimanjaro.



Field assistant collecting faecal samples in West Kili where both livestock and wildlife reside.



Top: PI & field assistant collecting faecal samples in Kitendeni wildlife corridor that connects Kilimanjaro National Park to dry Amboseli, West Kilimanjaro ecosystem.
Bottom: Faecal sampling in West Kilimanjaro.



Dry waterholes in Enduimet Wildlife Ranch, West Kilimanjaro.