Final Evaluation Report

Your Details	
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Project Title	Characterisation of *Maasai Alalili* Silvo-Pastoral Conservation Systems of Northern Tanzania
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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
To document and classify the existing types of *Maasai Alalili* systems in rangelands of northern Tanzania				The two types of *Alalili* systems (communal and private) were classified and mapped successfully. They were described and observed to be significantly useful to human, livestock and wildlife with regard to their spatial distribution across land use categories (GCA, NCA, Village land and WMA).
To characterize the *Maasai Alalili* systems in terms of bio-geo-physical features. These comprised of size and location (elevation, landforms and distribution) of *Alalili* systems across types and different land use categories through mapping. Description of the climatic and vegetation cover changes through (NDVI), selected soil properties, water sources, and status of fodder species composition featuring these *Alalili* systems				Not all soil properties characterising the surveyed *Alalili* systems were studied. Some soil properties were not covered due to analysis costs that went beyond the planned budget. Thus, only key soil properties for assessing the health of pastures were analysed. It was noted that, *Maasai Alalili* systems are faced with degradation pressures emanating from changes in social-cultural practices, land use, global climate, population growth, bush and anthropogenic encroachment, endangered soil health and water scarcity. However, communal *Alalili* depicted a highest abundance and distribution across land uses compared to private which means they can be sustained for future endeavours.
To assess ecological values and roles of *Alalili* systems for community livelihood and sustainability				It was found that a total of 22 ecosystem services are gained from *Alalili* systems by the surrounding communities, i.e., provisioning (five services), cultural (eight services), regulating (four services) and supporting (five services). *Alalili* systems are useful in wildlife conservation through provisioning of habitats, prey (for carnivores), fodder

				or forage (for herbivores), water, and breeding sites. It was found that *Alalili* systems offers a potential link between protected areas whereby, about 25 species of wild animals were identified to either inhabit, visit or pass across *Alalili* on their way to adjacent protected areas.
To assess socio-economic potentials for household income generation and livelihood improvement				This study identified that Maasai pastoral communities are economically supported by *Alalili* systems through income gained especially from fattening activities, penalties, milk sales, and *Alalili* renting. Other socio-economic advantages recorded were religious and spiritual practices, beekeeping, fuelwood, traditional medicine, recreation, and eco-tourism from which household income is gained and community livelihood is sustained.
To conduct training session and raise an awareness on the importance of traditional/indigenous local knowledge in rangeland and biodiversity conservation				The training sessions in all sample village under *Alalili* survey were conducted through village assembly and village rangeland management committees to raise a conservation awareness. Through this, a hybrid conservation knowledge for sustained health of rangelands were trained.

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

a) For the first time, the *Maasai Alalili* silvo-pastoral conservation systems have been characterised and officially described as one among useful and environmentally friendly traditional/indigenous conservation technologies for biodiversity and local-based rangeland management strategy. This eliminates the knowledge gap that existed between *Alalili* and other indigenous rangeland and environmental conservation systems such as *Ngitili* of north-western Tanzania and *Kalo* among the Borana communities in southern Ethiopia.

b) For the first time, this project has successfully generated the map summary which disseminates the current status of *Alalili* existence in terms of size, abundance and distribution across rangelands of northern Tanzania. This is representing one of the potential remnants of traditional knowledge for a sustained cultural and suitable nature-based conservation technologies in Africa.

c) For the first time, this work has benchmarked the synergistic relationship between human, livestock and wildlife through mutual benefits obtained from equal access and utilization of traditionally managed rangeland resources with respect to conservation of *Alalili* enclosures. The dissemination of this work continues to positively impact the community awareness and expand their biodiversity conservation perspectives through observable ecosystem goods and services obtained from utilisation of *Alalili* systems.

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

The local conflicts that ascended between *Maasai* community and the government through its natural resources management authorities affected the process of data collection since June 2022 to March 2023. Hence, it led into difficulties in accessing *Alalili* systems due to a great tension created among the *Maasai* pastoralists about land tenure in the study area. The *Maasai* land that experienced such a tragic movement was the Loliondo division and the Ngorongoro Conservation Area Authority (NCAA) especially during a voluntary reallocation of pastoralists from NCA to Msomera in Tanga region. This tension was also spread to other districts in the proposed study region; therefore, the project was conducted under great care received from District Game Officers (DGOs), District Rangeland Management Officers (ROs), Ward and Village Executive Officer (WEO/VEO), village rangeland management committee members, and *Maasai* traditional and cultural leaders till its completion for the safety of researchers.

Considering such inconveniences, we faced a challenge of transport to the study sites because most of the car hiring companies get worried of their vehicles from being attacked by *Maasai* warriors. However, the tragedy was successfully resolved. Therefore, time for data collection was extended beyond the proposed timeline to ensure the planned activities are successfully accomplished. The project team members had to be flexible with regard to such changes of the field trip schedules.

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

This work was 100% participatory whereby the local communities were directly involved since the project inception, data collection through field visits, focused group discussion, key informant interviews and the community interaction through village assembly and meetings with members of the village rangeland management committees. However, Maasai pastoral communities have benefited from this project by gaining new skills of evaluating the qualities of fodder plants in their *Alalili* before allowing grazing activities to be undertaken. Valuation of potential social-economic and cultural benefits of *Alalili* systems was conducted and communicated back to raise communities' awareness about the importance of conserving these traditional rangeland management systems from degradation. The pens, notebooks and brochures were supplied to members of village rangeland management committees to help them with documentation of any observed changes during management of *Alalili* systems for future evaluation.

5. Are there any plans to continue this work?

Absolutely, this work is planned to be continued to accomplish analyses of the remaining soil properties and estimating vegetative biomass and carbon stock for an enhanced characterisation of proper fodder vegetation growth suitability and support. It will assess effects of invasive species, drought condition and anthropogenic disturbances on survival of fodder plants in *Alalili* systems. It is also aimed at documenting and assessing both previous and current management typologies fitting to utilisation compliance of *Alalili* systems and make them formal through developing policy brief for rangeland conservation and management.

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

The findings of this research have been initially presented at an institutional level via graduate seminars, as well as feedback provisioning through village assembly and meetings with village rangeland management committee in each sample district. From this work, two manuscripts have been submitted in two different journals for publication. The first manuscript entitled "Sustaining indigenous *Maasai Alalili* silvo-pastoral conservation systems for improved community livelihood and biodiversity conservation in East African rangelands" is submitted to PLOS ONE for publication while the second manuscript entitled "The role of *Maasai Alalili* Silvo-pastoral systems in conservation and sustainable utilization of fodder species in East African rangelands" is submitted to the Journal of Rangeland Ecology and Management. Furthermore, this work has been presented at one international seminar held at Tezpur University in India. The results of this work are progressively shared through work presentations and social media. In addition to that, it is planned to be presented in the upcoming 15th TAWIRI Conference which usually involve more than 200 members from more than 30 countries globally.

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

We look forward to establishing sample *Alalili* plots in each district and land use category that will be used to assess the role of *Alalili* in combating effects of climate change. These will be regarded as demo plots for educating and conducting experiments for seeding the climate resilient herbaceous fodder species of high interest for sustaining *Alalili* management towards solving fodder scarcity. They will be utilized in assessing the domestication potential of the remnant fodder plants across rangelands of northern Tanzania.

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. The Rufford logo was printed in all brochures, posters, presentations, handouts, field data collection sheets, and t-shirts through which it has increased the foundation's publicity among local, regional and international scholars as well as the pastoral communities across the study area. The financial support from The Rufford Foundation has been further acknowledged in the two manuscripts submitted for publication.

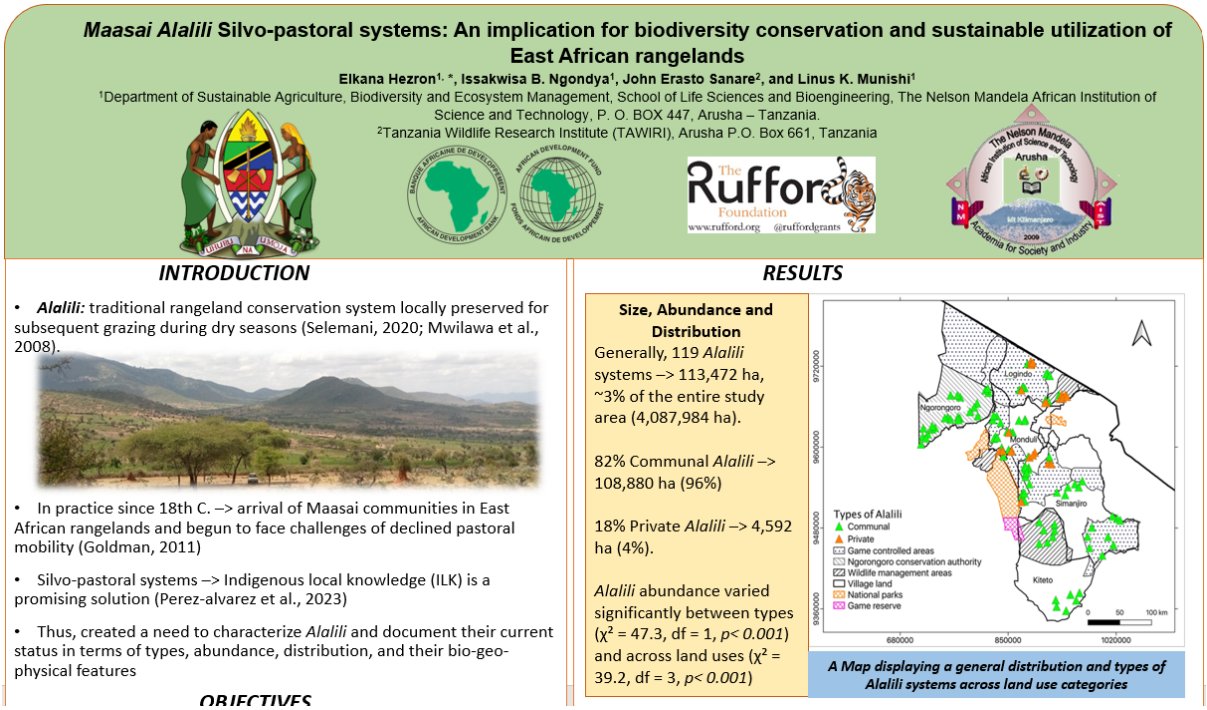

Fig. 1: One of the posters that was displayed in a single day symposium at Tezpur University in India

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

Mr. Elkana Hezron Misana (Project team leader): Project conception, designation, data collection, data analysis and interpretation, manuscript and report writing, dissemination of project output and conducting outreach activities.

Prof. Linus K. Munishi (Supervisor): He assisted in designing the methodology part for an enhanced data collection. He further contributed mapping activities and conservation education aspects. He substantially monitored the progress of the project and revised the submitted manuscripts.

Dr. Issakwisa B. Ngondya (Co-supervisor): He assisted in the process of research designing and revising data collection techniques. Also, He substantially monitored the progress of the project and revised the manuscripts.

Mr. Neovitus Siang'a: He assisted in collecting information pertaining rangeland management and dissemination of the *Alalili* conservation with respect to environmental education among the pastoral communities.

Mr. John Erasto Sanare: He worked as a field assistant at some points and mapping process of *Alalili* systems.

Mr. Kilelenjo Mereso: He worked as a field assistant and translator of the *Maasai* language.

10. Any other comments?

Firstly, as a project team, we are very much obliged for the financial support we got from The Rufford Foundation to facilitate the conduction of this project. Our heartfelt gratitude comes to the RF team as we believe without such a significant support, we could not manage to accomplish the planned activities across *Alalili* systems subjected in a diversified and wide range of landforms and locations.

Secondly, we would like to commend that this project has begun to impact the community awareness on the usefulness of traditional and local-based rangeland management practices indigenous to their areas. They are initially being informed about the characteristics describing the current status of *Alalili* silvo-pastoral systems and their roles in biodiversity conservation and livelihood sustainability. Moreover, we have benefitted from this work by upgrading our knowledge and technical know-how concerned with indigenous conservation management of natural resources.

Lastly, this project depicts that *Maasai Alalili* systems are faced with confounding threats of degradation and loss. Therefore, we are impressed that, with respect to funding from Rufford Foundation, this work will significantly be regarded of applied importance by the policy developers and rangeland management authorities for restoring ecosystem health in rangelands through *Alalili* advocacy.