



TANZANIA WILDLIFE RESEARCH INSTITUTE (TAWIRI)

Project Title: The Ecology of the Elephants of the Tarangire Ecosystem



July 2024

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1. Introduction

Nestled in Northern Tanzania, the Tarangire-Manyara Ecosystem (TME) is part of the Greater Maasai Steppe landscape. The 35,000 km TME supports about $4,624 \pm 1,072$ SE African elephants (*Loxodonta africana*), making it the fourth largest elephant stronghold in Tanzania.

Tarangire Elephant Research Project (TEP) has been implemented involving demographic studies of elephants for over three decades, making it the second-longest elephant project in Africa. In April 2022, the Tanzania Wildlife Research Institute (TAWIRI) took over the management of the TEP from the Wildlife Conservation Society of Tanzania (WCST). TAWIRI leverages the project's long-term data to derive strategic insights for mitigating human-elephant conflicts (HEC). The Tarangire-Manyara Ecosystem (TME) in the Northern landscape is a globally significant ecoregion, boasting the highest concentration of elephants in small areas. The commitment of wildlife conservationists and the allocation of resources to preserve this ecosystem, with its substantial elephant population, signifies a commendable dedication to conservation efforts.

Much of TEP's work has been centered around the field monitoring of 29 herds within the northern Tarangire elephant subpopulation. TEP has conducted comprehensive research on elephant demographics, actively gathering data on breeding biology, foraging ecology, habitat utilization, and general distribution. The data collected from the field is carefully compiled to ensure that new data can be statistically compared with the previously gathered information. Furthermore, TEP has coordinated and facilitated various work plans, including community outreach and consultancy projects.

2. Problem statement and Justification

To develop effective conservation plans and strategies for elephants in the Tarangire-Manyara Ecosystem (TME), it is crucial to have a comprehensive understanding of their demographic structure and behavior. While efforts have been made to protect elephant populations through general wildlife monitoring, it has become evident that sustainable conservation requires detailed studies of demographic composition and interactions with the environment. Although information on elephant distribution and abundance is generally accurate, there is a lack of knowledge regarding survivorship, reproductive rate, dispersal, and other demographic characteristics. Recognizing these needs, the

Tanzania Wildlife Research Institute (TAWIRI) has continued implementing the Tarangire Elephant Project to address the demand for such ecological information. Given elephants' significant dietary requirements and space needs, it is crucial to understand how anthropogenic threats and ecological constraints impact their feeding, space use, and reproductive patterns. It is evident that long-term, field-based monitoring research is essential to provide the necessary environmental data, justifying the continuation of the Tarangire Elephant Project.

2.1. Objectives of the research

- i. To continue the long-term demographic study of the Tarangire elephants.
- ii. To record all births, deaths, and other demographic events in the elephant population.
- iii. To continue to build up the individual photo identification file of all males, females, and infants in the northern sub-population.
- iv. To monitor elephant and other wildlife populations on village lands outside Tarangire National Park.
- v. To identify elephant movement patterns in the ecosystem
- vi. To facilitate peaceful coexistence between Humans and elephants by applying non-lethal conflict mitigation strategies.

3. Project area coverage

- i. National Park(s) Tarangire National Park.
- ii. Game Reserve; Mkungunero Game Reserve.
- iii. Game controlled areas(s) Lolkisale Game Controlled areas.
- iv. Community-based management areas, i.e., Wildlife Management Area(s) Randilen, Burunge, and Makame WMAs.
- v. Open areas (District, Ward, and Village) Simanjiro, Kiteto, Babati, and Monduli districts.

4. Project implementation methodologies

Elephant and other wildlife monitoring will be conducted using a vehicle-based approach. Each elephant herd under the project will be identified using distinct earmarks and facial wrinkle patterns unique to each individual. In addition to individual identification, the

survey will also involve identifying elephant family herds, male bachelor groups, and solitary old bulls. The survey will involve taking several photographs of the elephants for analysis. Furthermore, a field guide will be used to identify other wildlife, and all data will be recorded in the datasheet book. Data on the spatial-temporal movement and habitat utilization of elephants will be collected using a vehicle-based approach. Each elephant herd will be observed, its field behaviors will be documented, and its sighted locations will be georeferenced. Subsequently, the field data gathered will be collated using ARC to delineate the distribution pattern of the elephant population. Furthermore, the project will strive to innovate, imparting and equipping the local community with Non-lethal HEC mitigation strategies.

4.1. Tools to be used

The implementation of the project will require the use of a specific set of toolkits, which includes the following items: a vehicle for transportation, a camera for documentation, binoculars for observation, field datasheets for data collection, GPS for location tracking, batteries for the GPS and camera, pencils and scissors for various tasks, manila cards for note-taking, rubber for corrections, an external hard drive for data storage, and both a laptop and desktop computer for data processing and analysis.

5. Project Expected output

The project is expected to result in the following outcome;

- i. Data regarding the population structures of elephants and other wildlife will be collected and disseminated to assist wildlife management authorities in developing comprehensive conservation strategies.
- ii. Data regarding spatial-temporal movement and habitat use by the elephant will be collected and disseminated to assist wildlife management authorities in developing comprehensive conservation strategies.
- iii. Reducing conflict between humans and elephants in the Tarangire-Manyara ecosystem and similar areas by minimizing crop raiding and other elephant-related fatalities. These efforts aim to promote long-term peaceful coexistence between humans and elephants.