Integrating Earth Observation and Multi-Agent Modelling to Assess Climate and Land-Use Impacts on Large Herbivore Movement in Amboseli, Kenya

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1. Introduction

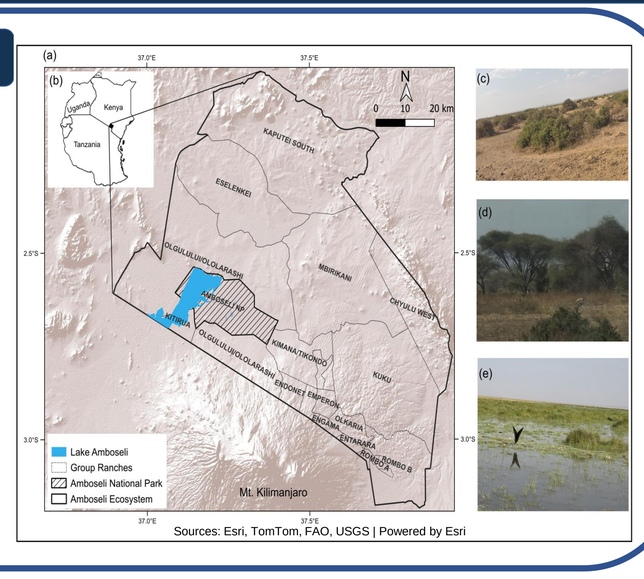
Large herbivores like elephants (Loxodonta africana) shape vegetation, drive nutrient cycling, and maintain trophic dynamics — yet their **distribution** and **health** face growing threats from **climate change** (including drought and reduced forage quality) and **habitat fragmentation** due to **land-use change.** [1]

This research aims to characterize how **climate** and **land-cover changes** influence the **population dynamics** and **health** of **large herbivores** using **ecological monitoring, remote sensing, and spatial modelling (Ocelet)** [2,3].

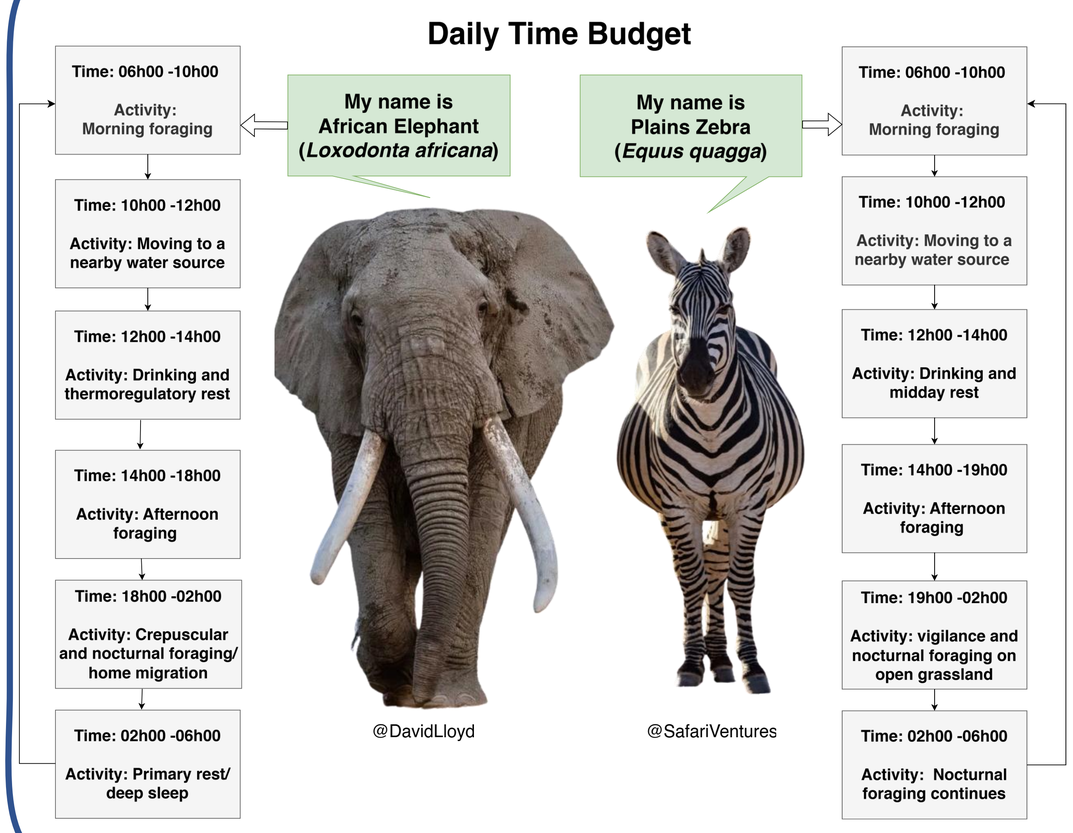
2. Study area

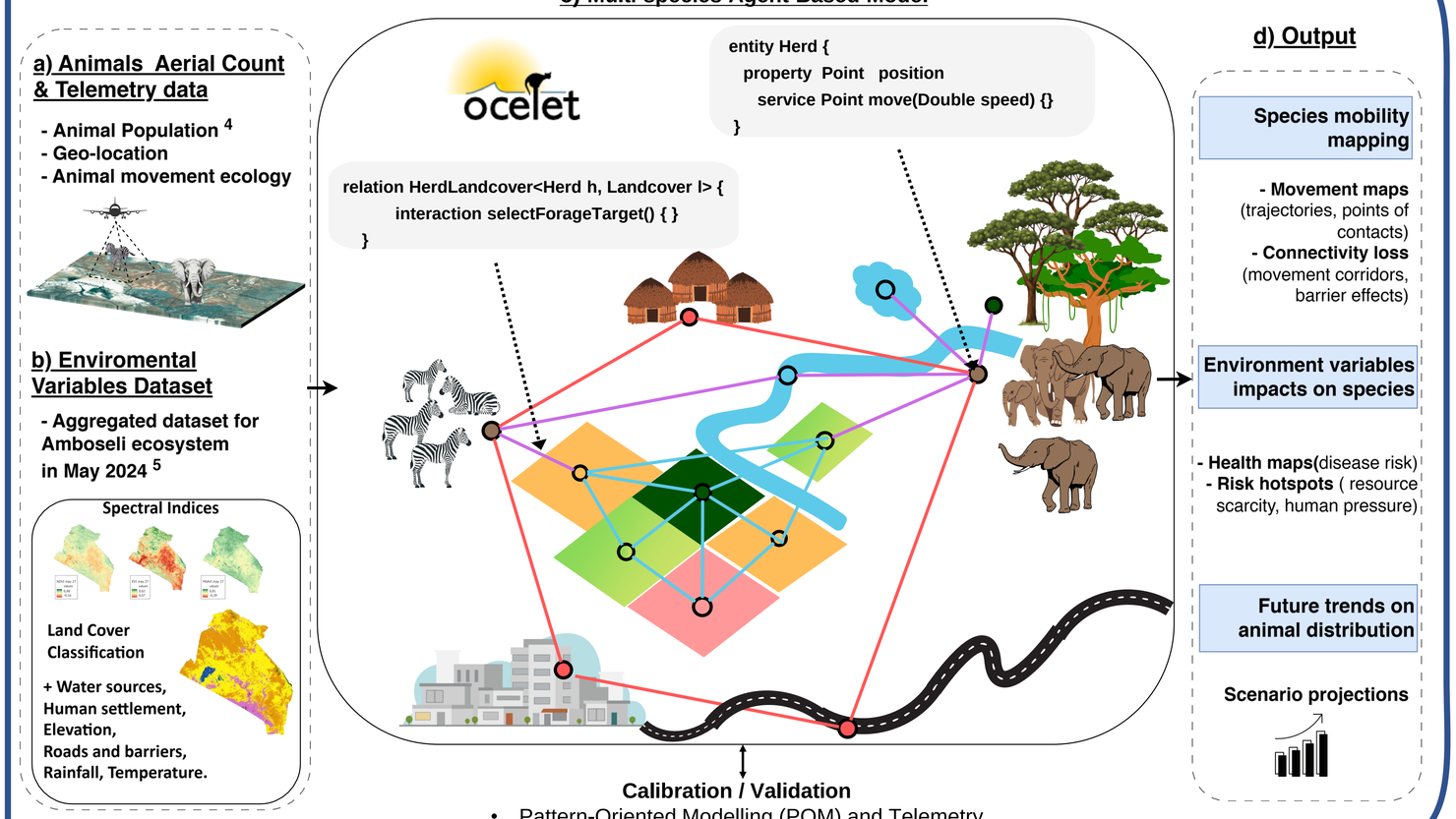
The **Amboseli ecosystem** in **Kenya**.

- Characterized by **arid to semi-arid climatic conditions.**
- Predominantly inhabited by **Maasai community.**



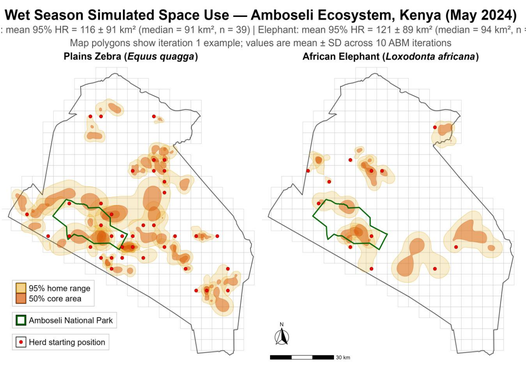
3. Methodology



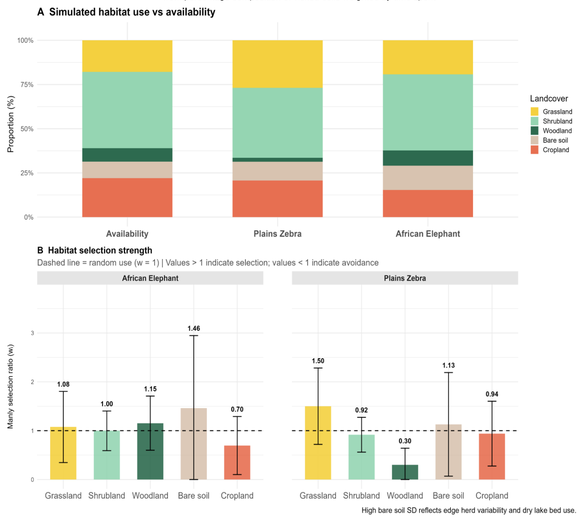


4. Preliminary Results

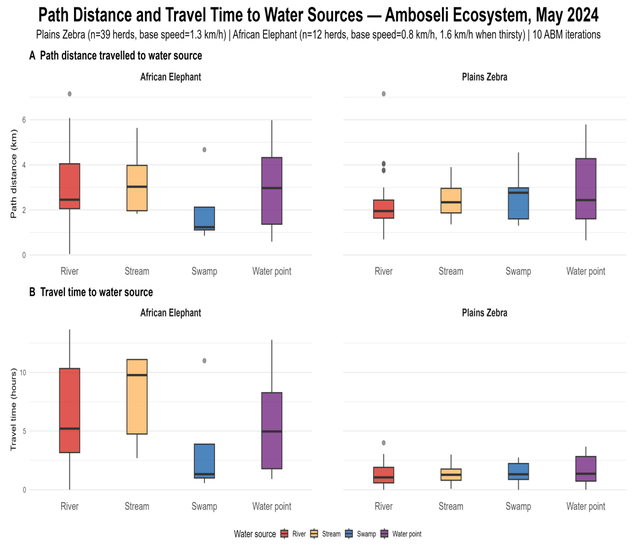
(a) Home Range/ Space Use:



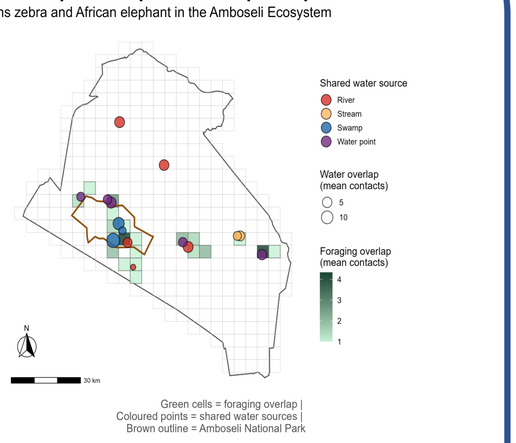
(b) Habitat Selection



(c) Path distance and Travel time to Water Sources



(d) Spatiotemporal Overlap hotspots



5. Perspective

- ❑ Use GPS collar data for calibration and validation.
- ❑ Include other large herbivores within the ecosystem such as wildebeest and cattle, and interactions between species.
- ❑ Simulate the impacts of the climate scenarios on the model (dry and wet seasons effects).

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6. References

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