Water | Health | Food

Operationalizing One Health to understand Socio-Ecological System dynamics in pastoral communities in northern Kenya

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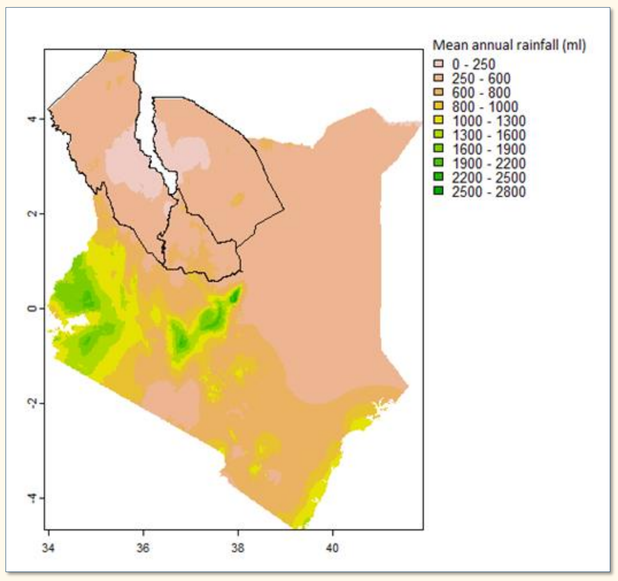
Background

- Food security and malnutrition are significant challenges in pastoral communities.
- Globally:
    - **10%** of under-5 child deaths result from diarrhoeal disease
    - Undernutrition is associated with **45%** of child deaths
    - **26%** of people do not have safe drinking water
- Diarrhoea and malnutrition are bidirectionally related
- Water resources are often shared between people, livestock and wildlife
- Shared water resources and zoonotic diarrhoeal disease is neglected in understanding food security
- A holistic approach is needed - **One Health** approach embedded in a **Socio-Ecological Systems** framework

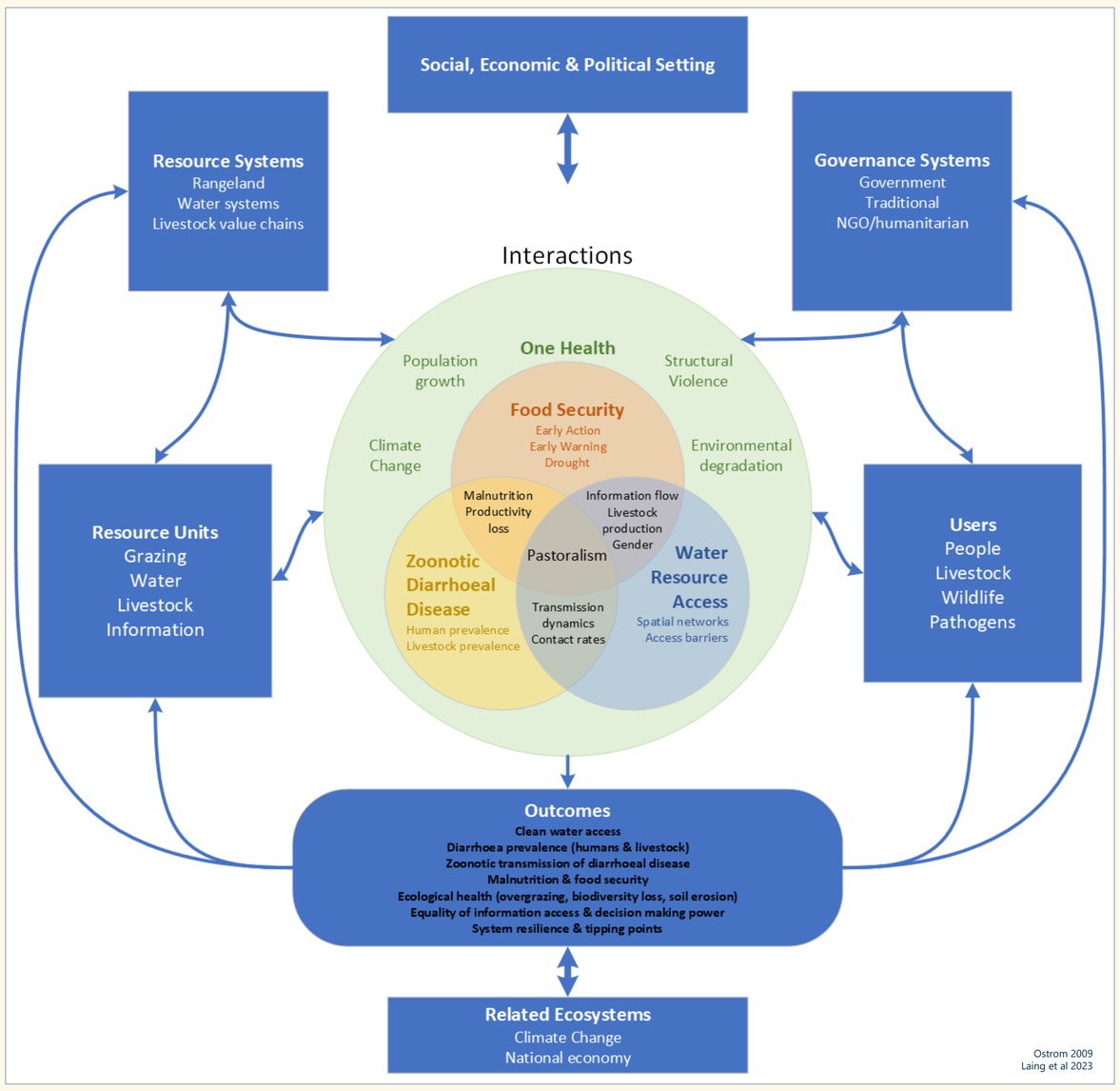


Aims & Objectives

What role do zoonotic diarrhoeal disease and water resources play in food security and health dynamics in a pastoral socio-ecological system in East Africa?

The aim of this project is to apply an interdisciplinary One Health perspective to food security and health challenges in pastoral communities of East Africa.

A mixed-methods approach will be used to investigate two non-traditional drivers of food security, namely zoonotic diarrhoeal disease and water resource use, and situate these drivers within a Socio-Ecological Systems framework for understanding the dynamics affecting food security and health in pastoral communities.

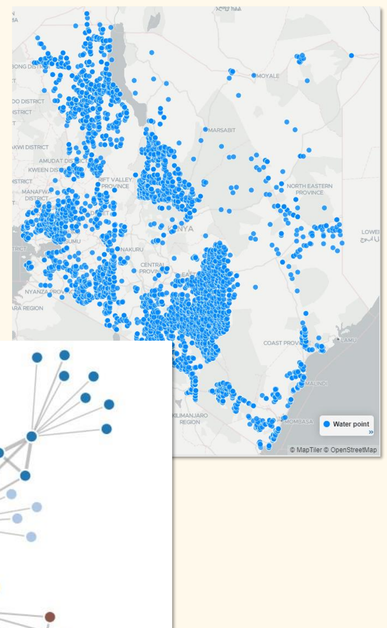


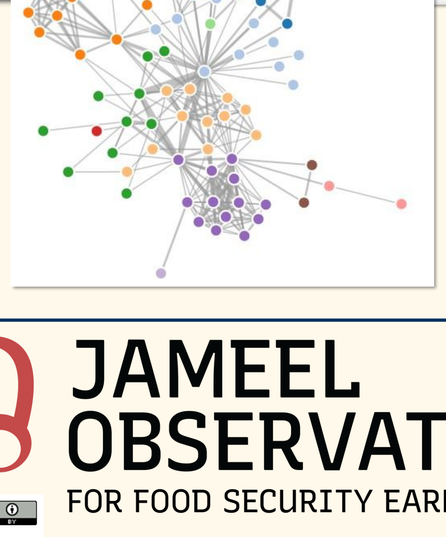
Objectives

1. Understand the role of water resources in landscape disease transmission and socio-ecological system dynamics
    a) How do waterpoints behave as nodes in a spatial network?
    b) How do waterpoints act as points of contact between species?
    c) How do livestock movements affect landscape-scale disease transmission?
2. Establish prevalence and transmission of zoonotic diarrhoeal disease
    a) What proportion of diarrhoeal disease burden is attributable to zoonotic transmission?
3. Understand Socio-Ecological System dynamics for food security and health early warning and early action
    a) How do findings fit within the lived experience of pastoralists?
    b) What cultural/traditional/behavioural factors affect the findings?
    c) How does information flow affect decision making on health, water and food security?

The plan

1. Spatial network & epidemiological modelling
    a) shared water resources to understand diarrhoeal disease spread
    b) GPS collaring to estimate movement and contact rates





2. Faecal sampling & phylogenetic analysis
    a) extent & dynamics of zoonotic transmission of diarrhoeal pathogens

3. Participatory methods (KIIs, FGDs)
    a) contextualise quantitative findings within holistic Socio-Ecological Systems framework

DTRA-NK
Mitigating the threat of vector-borne disease in Northern Kenya

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