Restoring rangelands for nutrition and health for humans and livestock

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Drylands Transform

An interdisciplinary research project for transformative change (Fig. 1) in the east African drylands (Fig. 2) with the aims to (i) contribute knowledge towards achievement of the Sustainable Development Goals (SDGs) and (ii) optimize synergies and minimize trade-offs between the SDGs through policy and practice.

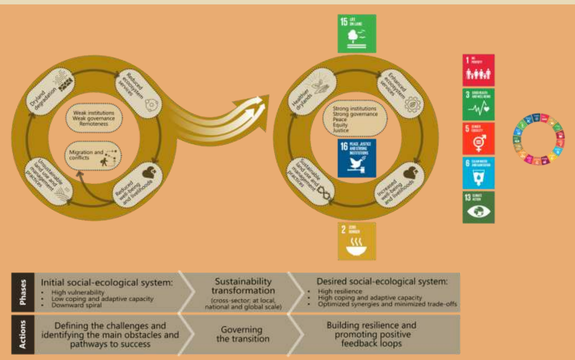


Fig. 1. Conceptual framework of Drylands Transform showing how the negative cycle can turn positive and support the SDGs.

Fig. 2. The geographical focus is the Karamoja cluster. Four study sites have been selected, two dominated by agropastoral and two by pastoral farming systems.

Key objectives

1. Assess land and ecosystem health at the landscape scale, explore links between livestock health and human wellbeing.
2. Co-develop sustainable rangeland restoration and management options with local communities in knowledge sharing hubs (Livestock cafés).
3. Understand the resilience of communities to seasonality and climate variability, and how livelihood strategies contribute to food security and human wellbeing in the face of environmental hazards.
4. Identify innovative land governance mechanisms and practices that effectively address livestock keepers' dependence on flexible and secure rights to land.
5. Co-design and evaluate alternative scenarios for sustainable dryland transformation in east Africa with stakeholders at local to national scales

Livestock cafés

Experimental research, training and knowledge exchange hubs

- Productive and sustainable landscape restoration
- Species for fodder, hay and tree production (Fig. 3, above)
- Erosion control and water harvesting (Fig 3, below)
- Soil fertility management
- Improved nutrition and productivity of rangeland animals
- Kitchen gardens and human nutrition
- Value addition of grass and local products

Fig. 3. Collecting seeds (above) and making structures for erosion control and water harvesting (below)

Field survey of land and ecosystem health

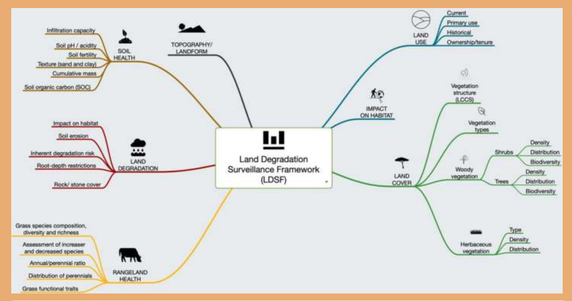


Fig 4. Land and ecosystem health indicators in the LDSF.

Biophysical baseline at the landscape level

The Land Degradation Surveillance Framework (LDSF) is a comprehensive methodology for assessing soil and land health developed by World Agroforestry (ICRAF).

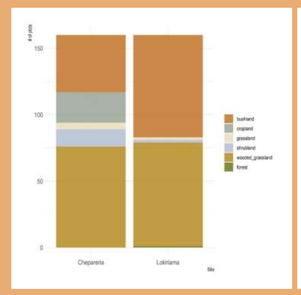
LDSF provides a consistent set of indicators and field protocols to assess soil and land health. Indicators measured include vegetation cover and structure, tree, shrub and grass species diversity, current and historical land use, soil properties (organic carbon, total nitrogen, infiltration capacity, texture) and soil erosion (Fig. 4).

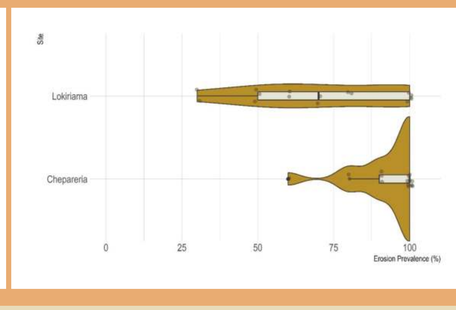
Data collection in the field follows a sampling design with 4 nested scales: Sites (100 km^2) > clusters (1 km^2) > plots (1000 m^2) > subplots (100 m^2).

Preliminary results

- The LDSF survey has been finalized in the two Kenyan sites Chepareria, West Pokot, and Lokiriama, Turkana.
- >50% of trees in Lokiriama were represented by just 1 specie (*Acacia Reficiens*) which is native to south and east Africa. In some areas it is seen as an invasive species as it spreads easily, in particular in degraded areas with erosion or overgrazing. The tree has no forage value and prevents other plant species from growing around it, including grass. Hence, A. reficiens encroachment is a threat to the livelihoods of pastoralists.
- Chepareria had more cropland (Fig. 6, left)
- Erosion prevalence was higher and more severe in Chepareria even though both sites were heavily eroded (Figs. 5 & 6, middle)
- Infiltration capacity was relatively low in many parts of Chepareria (Fig. 6, right)

Fig 5 Erosion was high or very high in Chepareria, Kenya.





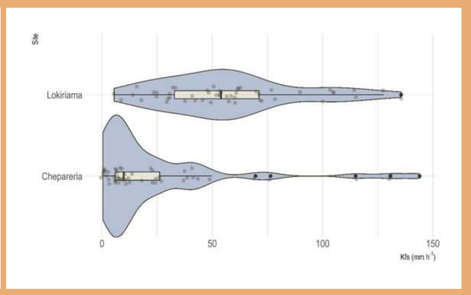


Fig. 6. Vegetation structure (left); erosion prevalence (middle), and infiltration capacity (right) in the two Kenyan sites. It is clear that the population and livestock density and erratic rains put high pressure on the land.

Contact Drylands Transform for more information

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