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Drylands Transform Project in the IGAD Region

Introduction

Drylands Transform (DT) is a research project led by the Swedish University of Agricultural Sciences (SLU) in partnership with a multidisciplinary team from the Intergovernmental Authority on Development (IGAD), Linnaeus University, Makerere University, Umeå University, University of Gothenburg, University of Nairobi, and World Agroforestry (ICRAF).

Drylands Transform investigates the links between land health, livestock-based livelihoods, human well-being, and land management and governance. The project will contribute new knowledge for transformative change and sustainable development of rangelands in the drylands of East Africa. The overall goal of Drylands Transform is to contribute knowledge for implementing and achieving the global Sustainable Development Goals (SDGs) in the East African drylands while optimizing synergies and minimizing trade-offs between the SDGs.

Through strong stakeholder engagement in interdisciplinary research, DT explores the challenges and pathways towards a socialecological transformation in drylands that optimizes synergies among the sustainable development goals (SDGs) while minimizing the trade-offs. Drylands Transform uses innovative field research approaches focusing on livelihood improvement through rangeland restoration and governance interventions in the Karamoja border region between Kenya (West Pokot & Turkana Counties) and Uganda (Napak & Moroto Districts). The four-year research project commenced in late 2021 and is funded by the Swedish Research Council for Sustainable Development (FORMAS).
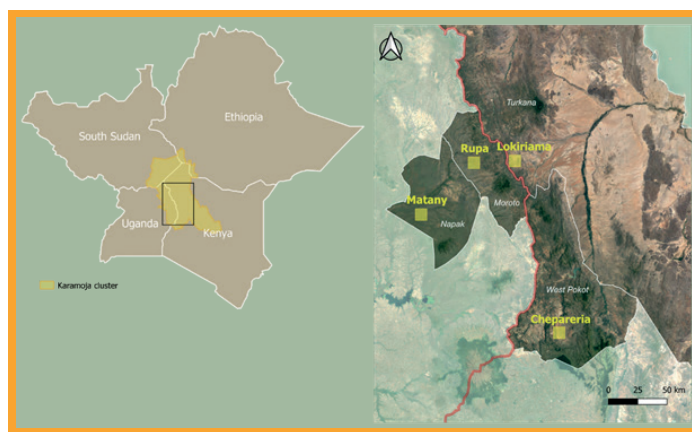

Fig. 1. The research sites in the area provide a variation in livelihood strategy, land management and climate. The two southernmost sites – Chepararia, in West Pokot County (Kenya) and Matany, in Napak District (Uganda) – are dominated by agropastoralist communities, whereas the two northernmost, more arid, sites – Rupa, in Moroto District (Uganda), and Lokiriama-Lorengkipi, in Turkana County (Kenya) – are dominated by pastoralists.

The project is structured into five areas corresponding to the main project objectives:

1. Assessments of soil and land health.
2. Co-developing rangeland restoration and sustainable management. options in knowledge-sharing hubs (Livestock cafés).
3. Linking climate to human health, nutrition and well-being.
4. Exploring innovative landgovernance mechanisms and practices.
5. Alternative scenarios for sustainable dryland transformation.

The Inter-governmental Authority on Development (IGAD)'s Centre for Pastoral Areas and Livestock Development (ICPALD) is the main project scaling partner and disseminates the project results at the Karamoja cluster, national and regional levels.

Objective 1: This ICRAF & SLU-led objective investigates the interlinkages between land health and human health and well-being. An essential first step to being able to investigate these interlinkages is to collect data on the ground. Field data on soil and land health has been collected across the four project sites using the Land Degradation Surveillance Framework (LDSF) to provide a biophysical baseline at the landscape level. The LDSF is a comprehensive methodology for assessing soil and land health. The LDSF developed was ICRAF about 20 years

land health. Indicators measured with the LDSF include vegetation cover and structure, tree, shrub and grass species diversity, current and historical land use, soil properties (soil organic carbon, total nitrogen, infiltration capacity, texture, etc.) and soil erosion prevalence. LDSF has been recently upgraded to include a ramgeland module.

The data and evidence generated using the LDSF is valuable for farmers, pastoralists and extension workers, project managers and

Fig. 1. LDSF survey proceedures implemented in the Karamoja region (Photos by B. Lokorwa).

ago in response to the need for indicator frameworks to measure and monitor soil and land health in a systematic, quantifiable, efficient and replicable way across landscapes. The framework provides a consistent set of indicators and field protocols to assess soil and

national and district-level decisionmakers.
This data will be used together with data from the project household surveys to understand the links between land health and human health across the four study sites.

Data collection activities

Preliminary results from the LDSF surveys show substantial differences among the 4 study sites regarding soil and land health indicators. For example, in the Kenyan sites, the prevalence of severe erosion was very high and soil infiltration capacity was low. In contrast, in the two Ugandan sites, herbaceous cover was high and erosion prevalence low. Chepareria site, in West Pokot county (Kenya), had the highest diversity of woody plants, while Matany, in Napak district (Uganda) had the lowest. Many of the identified trees and shrubs provide critical ecosystem services to local communities, as dryseason fodder, food and wood. The number of identified perennial grass

species was highest in Chepareria and lowest in Lokiriama (Turkana, Kenya). LDSF-derived evidence is critical to guide and design sustainable land management practices and restoration interventions that benefit people, the environment and support holistic decision-making around land health. Stakeholders at local, regional and global scales will be able to interact with the LDSF data in platforms and engagement workshops, which will function as a tool for scientific synthesis and as a concrete method for translating empirical results into policy-relevant pathways toward asustainability transformation of drylands in East Africa.

Objective 2: The Livestock cafés are experimental sites to study and showcase various water harvesting, fodder production and conservation technologies, trees management, establish novel co-generation of knowledge and colearning, act as knowledge exchange centres and create opportunities for fodder and livestock value chains and kitchen garden establishment for food and nutritional resilience building.

These cafés function to:

i) Engage with local communities, extension workers, non-governmental practitioners to test novel land restoration and management options in grazing areas for enhanced forage, food and income. The experimental plots are managed for improve forage production and can be utilized for hay cutting or controlled grazing by the local communities. Restricted timing and intensity of grazing is key to their management. Kitchen gardens have been established together with women in the nearby communities.

ii) Develop fodder and livestock value chains, the project is piloting value chain improvement activities and orient the communities towards value addition. Groups of local women, men and youth are being trained and familiarized with growing improved forage intercopped with fodder legumes, hay baling and livestock fattening, livestock products, e.g. meat and milk, and their value chains. This is practically building their capacity for restoration-based businesses that has potential to catalyse landscape scale restoration.

Fig. 2. Knowledge sharing interactions at the kitchen garden site (Photos by B. Lokorwa, S. Mureithi and M. Nyaga)

Fig. 3. Hay harvesting in Rupa, Moroto District (left) and sunflower seeds harvested in Chepareria Livestock Café for oil production (Photo by Z. Angella & S Mureithi)

Gullies being rehabilitated at the Livestock Café sites in Chepareria Ward (Photo by M. Nyaga)

Field experimentation plotS: Rangeland grasses intercropped with forage legumes planted along contour line and half-moons which harvest water, controls soil erosion and checks gullies (Photos by C. Norah & S. Mureithi)

Comparison of the fenced re-seeded experimental plot to the left and a neighbouring plot to the right (Photo by C. Norah)

Kitchen garden area with a high diversity of crops in a semi-arid area of Cheparria Ward, West Pokot County (Phoro by B. Lokorwa).

Farmer's field day engagements at the Livestock Café at Chepukat Village, Chepareria Ward (Photos by L. Tusiime)

Additionally, a farmer's field day was held on 14th September 2022 to showcase the various technologies and food crops that were planted in the kitchen garden area. Demonstration on the half-moon water harvesting structures, vertiver contour lines for gully control and rangeland grass reseeding and intercopping with forage legumes for forage quality improvement, various regenerative kitchen gardening technologies were show-cased accomplished from the severly formerly degraded land.

Dryland Transform achievements so far and conclusions:

1. Assessment of land health at the landscape scale using the robust Land Degradation Surveillance Framework (LDSF) in all the project sites. Data for this objective is being analyzed and we have preliminary results. This objective supports 1 Master student each at Makerere University and University of Nairobi and 1 post-doc at SLU.

2. Establishment of Livestock Cafés – knowledge sharing hubs for co-developing sustainable rangeland restoration and management options with local communities, extension workers, practitioners, policy makers and researchers. We are building the capacity of the agro-pastoralists and pastoralist communities in degraded rangeland and restoration for fodder production and conservation, gulley control and rehabilitation, kitchen gardening and regenerative agriculture for improved food and nutrition security of the households, value addition of fodders, livestock and marketing. This objective supports 1 PhD students each at Makerere University and the University of Nairobi.

3. Understand the impact of climate variability on livelihood strategies and resilience. We carried out and elaborate baseline survey in July 2022 and follow up survey in Feb-Mar 2022. These surveys have generated a lot of data that is being utilized by 3 doctoral students (2 at Makerere and 1 at UoN) under this objective.

4. The project has also collected valuable data in identifying innovative land governance mechanisms and practices that effectively address pastoralist production system's dependence on both flexible and secure rights to land.

5. Under knowledge sharing in the co-learning hubs, the project has so far conducted one Farmer's Field Day in Chepareria, in West Pokot County in Kenya. More field days are planned in the other three sites to show case the various drylands transformative technologies in fodder and food production that has ability to transform the region into feed and food surplus producing areas. Going forward, we will also synthesize and scale-up key research findings to develop future scenarios in policy and practice, and disseminate widely in the IGAD region.

Lessons Learnt

1. Even the most severely degraded land can be restored through regenerative approaches involving water harvesting and increasing organic matter in the soil while involving the local people.

2. Prevalences of malnutrition is prevalent in Karamoja region for children under 5 years and nursing and expectant mothers. Local and national governments, practioners and researchers need to work together and come up with ways of building sustainable food and nutiritional resilience through landscape scale land restoration approaches.

3. Promotion of high crop diversity kitchen gardens established therough regernerative approaches is an appropriate approach of enhancing food and nutrition resilience in the drylands.