

Triple L - Land, Livestock and Livelihood in Dryland Systems

The Triple L research initiative is a multidisciplinary research initiative taking its base in the land-use and livelihood transformations that has taken place in West Pokot, Kenya, during the last three decades. We argue that these transformations are relevant and common to vast areas of drylands in Sub-Saharan Africa and aim to analyse, understand and learn from this development.

Background and justification

Drylands cover around 40 percent of the world and host nearly 1/3 of its human population and 50 percent of the world's livestock, traditionally used and managed by nomadic pastoralists through communal or common property rights based land tenure systems. In Sub-Saharan Africa, 40 percent of the total available land is mainly used for livestock; 25 million pastoral and 240 agro-pastoral farmers depend on livestock as their primary source of income. Many drylands have a history of being overgrazed and degraded lands with low productivity, recurrent struck by famines, arena for land conflicts with economic and political marginalization of pastoralist communities. They are also faced by the challenges posed by the combination of climate change and accelerated growth in demand for livestock products due to human population growth, rising incomes, continuing urbanization and changing food preferences. Therefore the need for sustainable intensification of livestock production in the sub-Saharan drylands is receiving increasing policy attention.

An ongoing transformation

Up to now, most government development policies related to nomadic pastoralism in Africa have been based on the paradigmatic idea of a Tragedy of the Commons, considering pastoralism as a land use mismanaging dryland resources and being responsible for land degradation through overgrazing of communal rangelands. Pastoralist societies is also commonly associated with growing economic inequality and impoverishment due to limited possibilities of increasing livestock productivity and improving household incomes through livestock marketing. Pastoralist are furthermore often under increasing pressure from expansion of agriculture into grazing lands, especially in semi-arid areas. This trajectory have been reinforced and complemented by ideas of a *livestock revolution*. Increasingly framing agricultural research- and policy debates in Africa, the livestock revolution describes an ongoing, general trajectory in arid and semi-arid lands from nomadic pastoralism on communal rangeland to increasingly sedentary, private and market oriented livestock-based agro-pastoralism. However, considering the comprehensive environmental and human impacts implied by this transition, there have been surprisingly few interdisciplinary studies of the economic, social and environmental dynamics and relationships of emerging livestock-based, agro-pastoralist systems and their sustainability outcomes.

Importance of livestock

Historical changes for the demand for livestock products have been largely driven by human population growth, income growth and urbanisation. Livestock is currently one of the fastest growing agricultural subsectors in developing countries. Common to many drylands in SSA is a rapid population growth and the rate of urbanisation is high. Food demand for livestock products is predicted to double in SSA between the year 2000 and 2050. One of the most powerful ideas to emerge in relation to the challenges faced by drylands is *the Livestock Revolution*, denoting the ongoing and projected accelerated growth in demand for livestock products due to human population growth, rising incomes, continuing urbanization and changing food preferences.

Pastoralists becoming agro-pastoralists

Recent research indicates rapid processes towards intensified, agro-pastoralist production systems in East African arid- and semi-arid lands (ASAL). Like land-use change in general, such change tends to be driven by a dynamic and complex set of interacting driving forces, including ecological, demographic, economic, technology, institutional, and cultural change. While most earlier studies on transitions from nomadic pastoralism to agro-pastoralist livelihoods have focused on the trajectory from livestock based to

agriculturally based systems (e.g., Greiner, Alvarez and Becker 2013), recent studies rather point a transition from nomadic pastoralism to a diverse and wide range of alternative livelihood strategies (often pursued in combination), including commercial farming, increased marketing of livestock, dairy and hides, entrepreneurship through different types of businesses and shops, wage labor and salaried employment, and petty commodity trade.

Enclosures

At the heart of this transition, especially in semi-arid areas, is the enclosing of land for purposes of intensive grazing, production of fodder, or food crop production. The practice of enclosures is not something new and covers a wide range of management techniques ranging from the physical fencing off of smaller parcels of land for private purposes to more implicit social contracts regarding the use of larger areas of communal land. In some areas, enclosures constitute a traditional management tool and in other areas enclosures were introduced in order to rehabilitate degraded rangelands. What is new however is the increasingly common use of enclosures as a way of privatizing communal land, driven by a combination of increasing restrictions on livestock mobility due to population increase and emerging and expanding markets for livestock and agricultural products in arid- and semi-arid areas.).

While the practice of enclosing communal land can be seen as an important management tool for sustainable intensification of the ASALs within the general framework of a market-driven livestock revolution, it is also being contested by recent case-studies across East Africa. The criticism against enclosures is predominantly based on observed, negative social impacts in terms of erosion of traditional, collective property rights, emergence of conflicting interests over land- and water resources, and a gradual transfer of assets from poor to wealthier households.

In order to understand the transition from nomadic pastoralism to livestock based agro-pastoralism in semi-arid East Africa in general, and the increasingly common practice of enclosures in particular, we have to move from simplistic and linear representations of both the causes of change and the processes of change themselves to a focus on situation-specific interactions among a large number of factors at different spatial and temporal scales (including natural variability as well as economic, technological, demographic, institutional and cultural factors), working gradually as well as taking place intermittently. This presupposes interdisciplinary research with a capacity to uncover the human- and socio-environmental dynamics of emerging agro-pastoralist systems, with a focus on driving forces, processes and sustainability outcomes.

A short description of the West Pokot Transformation Saga

In the late 80's the NGO Vi Agroforestry introduced enclosures and agroforestry for land rehabilitation and increased productivity in Chepareria division in West Pokot, Kenya, that traditionally has been a pastoralist region. Adoption was initially slow, but after some successful demonstrations and intensive extension the methodologies were widely adopted by local cattle owners. This coincided with land tenure changes, i.e., more individualised land user rights. Nowadays enclosures dominate the landscape in Chepareria. In the neighbouring division of Kongelai the Vi Agroforestry initiative came in later, with less intensity and shorter duration. Much of the development seen in Chepareria is largely unseen in Kongelai.

Local residents, authorities and development workers, as well as our own impression, witness that there has been dramatic changes in land use by increase in vegetation cover and decrease in land degradation, in land use and livestock management with more enclosures for regulated grazing, introduction of improved breeds as well as in development of infrastructure through roads, market, primary and secondary schools in Chepareria during the last three decades.

Enclosure of land for the protection and management of pasture (with individual land tenure) in the drylands of West Pokot could be one driver of socio-economic development. Enclosed areas seem far more productive and less degraded than adjacent common/communal land use.

Research issues and research team

The changes in land use, land tenure, animal husbandry, agricultural diversification as well as infrastructural and cultural changes and the differences between the two divisions pose a very interesting setting for research. As the factors and processes clearly involve several biophysical as well as socio-economic factors, this research will be done by a highly multidisciplinary research team. Single research projects and scientific publication may concern one or only a few scientific disciplines, but the overall initiative contains the full width in expertise and disciplines represented by its participants. In this initial stage the Triple L Initiative have specialist participants on economics, animal husbandry, botany, systems and production ecology, agricultural intensification, institutional change, soil and water conservation, pastoralism, human ecology, geography, climate change and remote sensing. Other disciplines and expertise may be involved in the future. We represent ICRAF, ILRI, KARI, Nairobi University, Jomo Kenyatta University of Agriculture and Technology, Swedish University of Agricultural Sciences, Lund University and Gothenburg University. The research issues at hand would concern the CGIAR Consortium Research Programs (CRPs) on Dryland Systems (1.1) (<http://crp11.icarda.cgiar.org/crp/public/>), Forest, Trees and Agroforestry (6) (<http://worldagroforestry.org/research/crp-6-forests-trees-and-agroforestry>) and Climate Change, Agriculture and Food Security (7) (<http://ccafs.cgiar.org/>). We do have a very close cooperation with the NGO Vi Agroforestry mentioned above as well as with local authorities and technical advisers (i.e. County administration, area DDO, DLVO, DFO, DAO, Chiefs and Assistant chiefs, who participated in our constituting workshop). Figure 2 contains research issues identified that are to be addressed (if funding is achieved), this is however not exclusive. Gender and governance are seen as cross-cutting issues for all research.

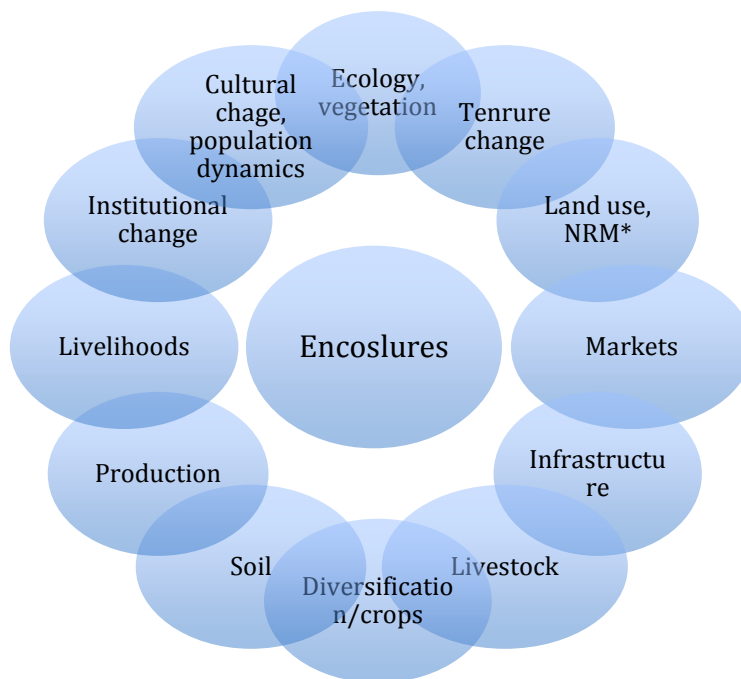


Figure 1. Pertinent research issues identified to be addresses in the Triple L Initiative. *NRM = Natural Resource Management

As we will work with adjacent and partly contrasting divisions much of the research will be on natural landscape/watershed level as well as on individual farm/plot level. This landscape approach will be relevant for both biophysical and socio-economic research (household and community/village/market levels/scales). More detailed objectives and hypotheses will be developed within the specific research and student projects.

Aim and hypotheses

The overall aim of this research initiative (Triple L) is to analyse and understand the changes associated with the increased vegetation and enclosures in Chepareria as compared to Kongelai from 1987 until 2014.

On the overall initiative level we will work with four common hypotheses:

1. Individualisation/privatisation of pastoral land leads to higher productivity
2. Differences in vegetation cover and/or composition between sites (and over time) are explained by the adoption of enclosures.
3. Changes in vegetation and animal productivity have improved the livelihoods.
4. Research results are geographically widely relevant and applicable.
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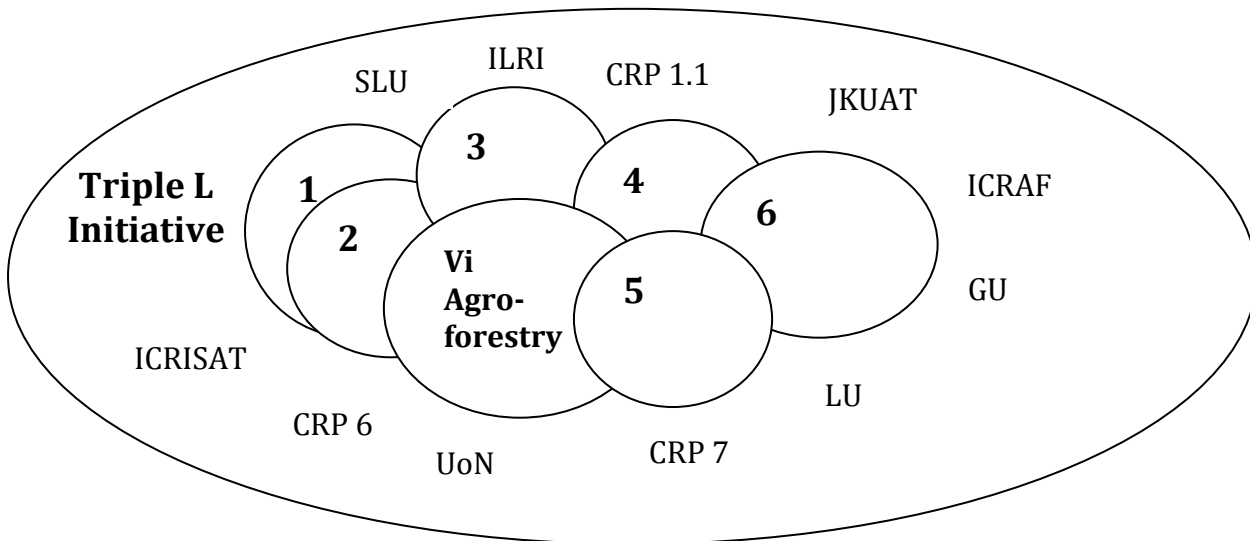


Figure 2. Conceptual figure of the collaboration group in the Triple L Initiative.