Tropentag, September 17-19, 2013, Stuttgart-Hohenheim

"Agricultural development within the rural-urban continuum"

A Feed-Based Typology of Crop-Livestock Systems in Eastern Africa

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Abstract

Over two thirds of the human population lives in mixed crop-livestock systems, and they provide the majority of cereals and livestock products in developing countries. However, productivity of mixed farms in sub-Saharan Africa (SSA) remains low, despite a projected doubling of demand for meat, milk and eggs until 2050. Livestock production is also known for its large ecological 'hoofprint' by consuming significant amounts of land, nutrients and water and generating 18 % of anthropogenic greenhouse gas emissions (GHG). Sustainable intensification is needed to increase outputs with more efficient use of all inputs on a durable basis, thereby minimising trade-offs between productivity, livelihoods and environment.

Livestock feeding lies at the heart of sustainable intensification. Sufficient quality and quantity of feed on a consistent basis is the main constraint of smallholder livestock production in SSA, considering that feeding can constitute up to 70 % of total production costs. At the same time, feeding requirements can lead to considerable global land use change, degradation and GHG – *e.g.* 50 % of GHG associated to land use change is attributed to livestock production. Integration of improved tropical forages could play a role in sustainable intensification by increasing productivity while preventing and/or reversing land degradation, improving nutrient cycling and mitigating climate change through carbon sequestration and reduced nitrous oxide and methane emissions.

Crop-livestock systems in SSA are highly diverse and dynamic, based on site-specific conditions such as agroecology and markets, resource endowments, land use, farm management and livelihood strategies. Instead of giving blanket recommendations or aiming at 'silver bullets', we need to better understand the heterogeneity of farming systems, past trajectories and possible future pathways if we want to target sustainable intensification interventions. The proposed feed-based typology of crop-livestock system clusters crop-livestock systems along an intensification gradient from extensive communal grazing, residue feeding, tethering to zero-grazing cut-and-carry feeding. Each type represents an alternative state within a given system. The feed-based typology will be further used to (a) understand the multi-dimensional (potential) impact of different intensification pathways and associated trade-offs at farm, landscape and regional level; (b) identify entry points for sustainable intensification and target tropical forage system interventions.

Keywords: Crop-livestock systems, farm typology, sustainable intensification, tropical forages

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