Potential farm to landscape level impact and adoption of forage technologies in smallholder dairy production systems in Tanga, Tanzania

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Livestock feeding and tradeoffs

- Lack of sufficient quantity and quality feed is one of the major productivity constraints for smallholder dairy farmers. Improved forages provide an opportunity for sustainable intensification
- However, forage technologies will only be adopted if they contribute to whole farm performance, thus reducing tradeoffs between productivity, socio-economics and environment
- Ex-ante impact assessment and scenario analysis can assist in prioritizing and targeting of development investments

Figure 1. Livestock farmers and members of the local Innovation Platforms in Lushoto (Pictures An Notenbaert, CIAT)

Lushoto, Tanzania

Study site is Lushoto, located in the Usambara Highlands of north-eastern Tanzania. High soil erosion due to continuous cropping on steep slopes (Fig 2)

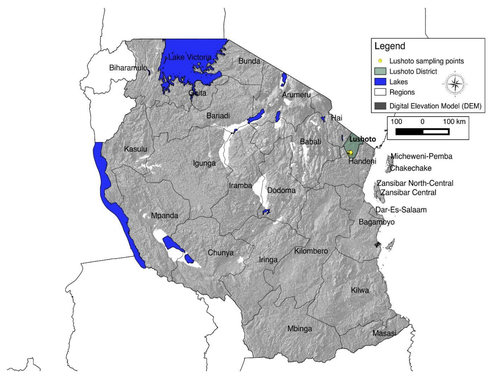

Figure 2. Map of the study site (left); hilly landscape in Lushoto where Sharifa Juma digs terraces planted with Napier grass to prevent erosion (right; picture Georgina Smith, CIAT)

Keeping livestock is a common practice, complementing arable cropping. However small land sizes pose challenges to livestock feeding thus the bulk of the feed basket is constituted by low quality natural grasses (Fig 3).

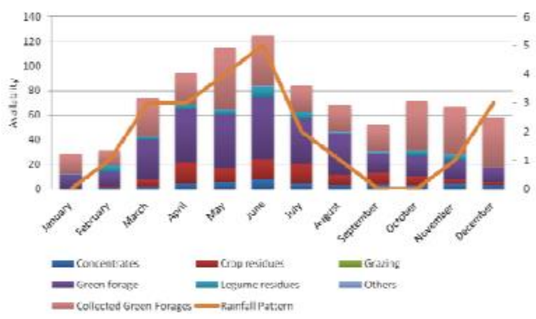

Figure 3: Livestock feeding with natural collected forages (left; picture Rolf Sommer, CIAT); availability of feeds throughout the year in Ubiri village (right; from Mangesho *et al*. 2013)

What has been done in the past – the MilkIT project

Establishment of local and regional Innovation Platforms (IPs). IPs are a social learning method, building on collaboration between different stakeholders along the value chain (Fig 4)

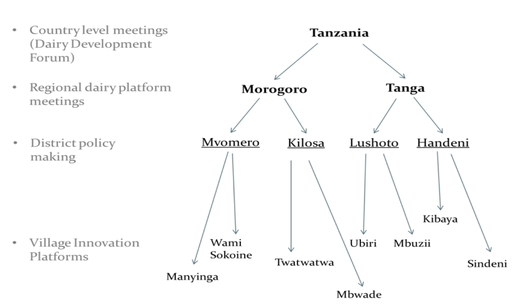

Figure 4. Schematic illustration of linkages between Ips at different levels in Tanzania (left, from Paul *et al.* in press); Manyinga village IP meeting (left' picture Fred Wassena, CIAT)

Demonstration trials and IP members receiving planting materials of various forages, and agronomic data was collected (Fig 5)

Site	Forages	Women (no.)	Men (no.)	Total (no.)	Forages received from TALIRI
Ubiri	Received in 2014	11	14	25	Napier hybrid, Napier Kakamega II, Greenleaf desmodium, Mulberry and Gliricidia sepium
	End of 2015	38	49	87	
Mbuzii	Received in 2014	9	19	28	Napier hybrid, Napier Kakamega II, Greenleaf desmodium, Mulberry
	End of 2015	9	19	28	Canavalia brasiliensis (only in demo plot)

Figure 5. Table showing participation of farmers in forage planting (above; from Maass 2015); SUA/CIAT MSc student Cyril Lissu collecting agronomic data in Napier-Desmodium intercropping trials in Ubiri and Mbuzii (below; pictures Cyril Lissu, SUA/CIAT)

What needs to be done – the new BMZ/GIZ project

i) Analyze feed gaps and identify entry points for sustainable intensification; ii) Assess potential impact and tradeoffs of forage technologies at farm to landscape scale using FarmDESIGN and LandscapeIMAGES models; iii) Explore adoption potential of forage technologies using the QAToCA method; iv) Raise awareness among stakeholders to improve prioritization of interventions.

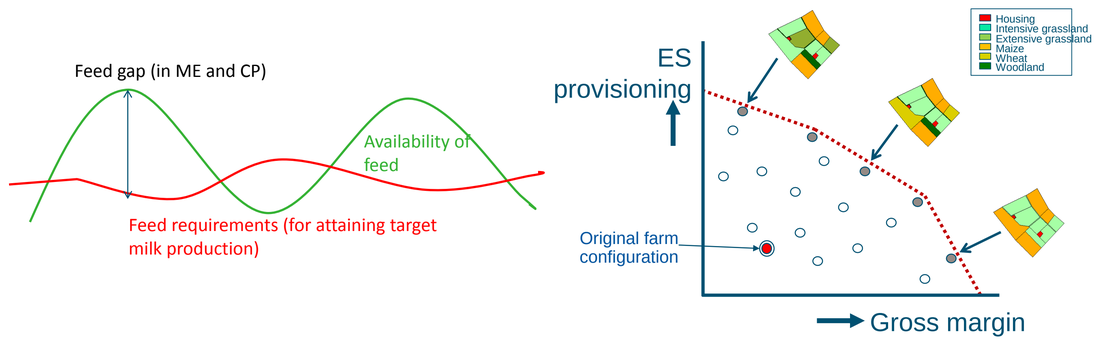

Figure 5. Conceptual diagram of the feed gap analysis (left); schematic representation of landscape scale tradeoffs as analysed by the LandscapeIMAGE model (right; from Groot & Rossing, 2011)

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