NEADAP
Netherlands East Africa Dairy Partnership

Regional Dairy Policy Brief East Africa's Forage Sub-Sector

Pathways to intensified sustainable forage production

In East Africa, the dairy sector has enormous potential to contribute to nutritious and healthy diets, create new jobs, increase income of farmers and agribusiness and improve livelihoods.

Dairy production in East Africa is characterized by low productivity, mainly due to animal nutrition constraints. There is a mismatch between the push for genetic breeds with high potential for milk production and the availability of quality forages that can meet the nutritional requirements of these breeds. In addition to the generally low quality of fresh and preserved forages and pastures, resulting from relaxed management practices and limited availability of pasture and forage seeds and planting material, there is high seasonality in supply of forages. Most areas experience an acute shortage during the dry season and in this period the available forage is of very poor nutritional quality. To increase production in pasture based dairy systems and to reduce feeding costs in systems with supplementary feeding (e.g urban and peri-urban farming)- where feeding costs may present up to 60-70% of total milk income - this brief lists a number of solutions to enhance access to quality and quantity of forages year round.

Figure 1. Main problems faced by the forage sub-sector in East Africa

. Forage quality and quantity
- -low digestible forage
- -low feed efficiency
- -high feeding cost
- -unbalanced rations
- -no forage analysis labs

. Access to seed and plant material is limited

. Seasonality (forage production is rain dependent)
- -forage preservation methods not utilized
- -effect climate change on seasonality

. Education and training
- -effect of agronomic practices on ruminant nutrition
- -from seed to feed to safe milk

Moving Forward

Forage quality and scarcity have been identified as amongst the key factors determining the growth and compe-titiveness of dairy (and beef) production and the livestock sector at large. Current innovations should to be scaled-up and others introduced and fast-tracked. To address improvement of forages, forage related inputs, especially improved forage seed, mechanisation and service provision. A full package approach as shown in Figure 2 below, will enhance adoption rate of improved forage technologies by farmers, and will create a positive impact on the farm operations in general and on feed efficiency of the dairy cow in particular. The latter is a key requirement for realizing the cow's genetic or production potential.

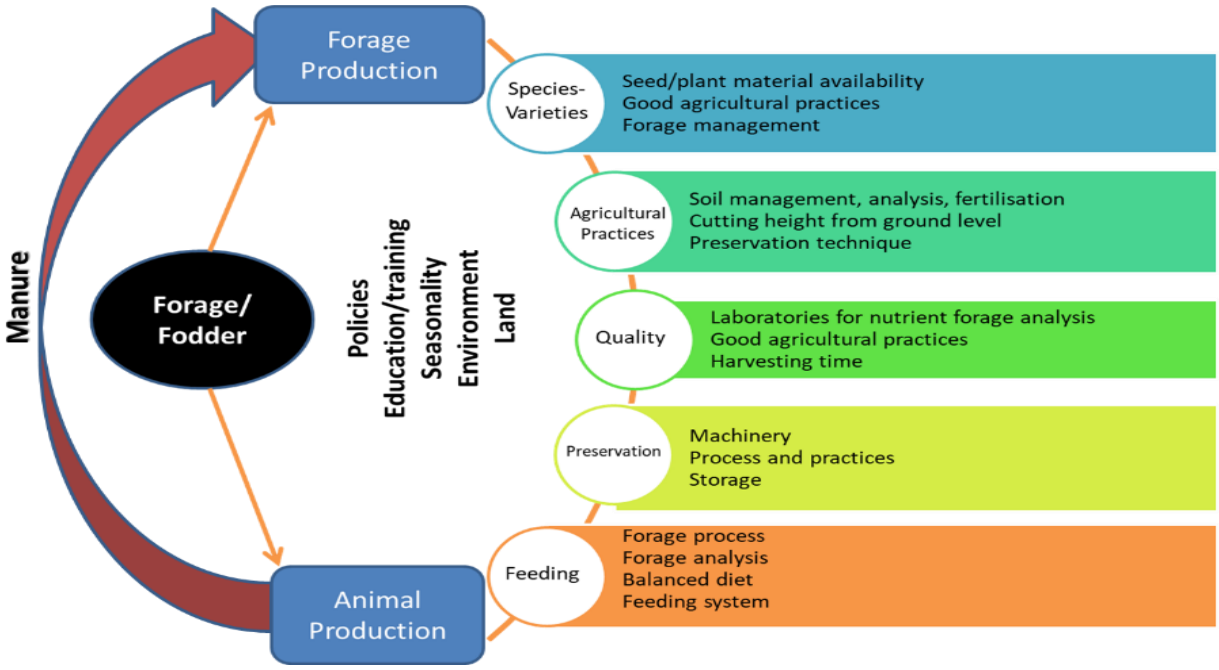

Figure 2. Full package approach to improved of forage production and feeding

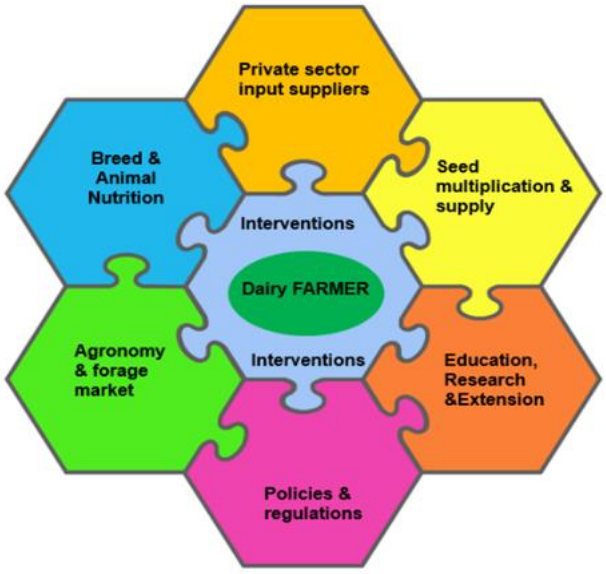

Figure 3. Diagram of interventions in the forage value chain

These innovations in various parts in the forage value chain should address a number of topics, putting the farmer in the centre, as shown in Figure 3:

- *Agronomy and forage market:* smart-agricultural practices, new preservation techniques, scaled technology and machinery, enhanced professionalization of forage contracting services, trading and pricing of feeds and forages based on their nutritive value.
- Breed and animal nutrition: select "suitable breeds for the available feeds" and optimize milk production by linking forage quality to ruminant nutrition; include feed safety aspects.
- *Private sector input suppliers:* quality input supplies and services, including distribution of forage seeds and plant material, fertilizers, farm machinery, agricultural contracting services and soil & feed testing facilities.
- *Seed multiplication and supply:* availability (through registration and dissemination) of certified, high performing forage species and varieties in terms of nutritive value and production per acre.
- *Education, research and extension:* effective knowledge and skills development chain with the aim to intensify pasture management and forage production at the dairy farm and regional and national level in an environmentally sustainable way.
- *Policies and regulations:* conducive policies and regulations to drive innovations; address forage seed availability; encourage agricultural entrepreneurship among youths and private sector investments in the forage sub-sector.

Table 1 shows a simple economic analysis how improvement of forage quality is an important driver to increase cow performance and profitability and reduce enteric methane emissions.

Forage crop & cutting stage	Forage Quality	Milk Production litres/day	Enteric Methane Emission CH4 g/litre milk	Margin After feed cost KES/day
Napier > 120 cm	Low	1.3	261.9	0
Napier = 120 cm	Medium	2.7	128.8	4
Napier < 60 cm	High	6.4	51.4	115

Table 1. Example of forage quality and its relation with milk production, enteric methane emissions and profitability, all for a 500 kg lactating cow under Kenyan conditions. (Source: Quick scan of Kenya's forage sub-sector, 2019)

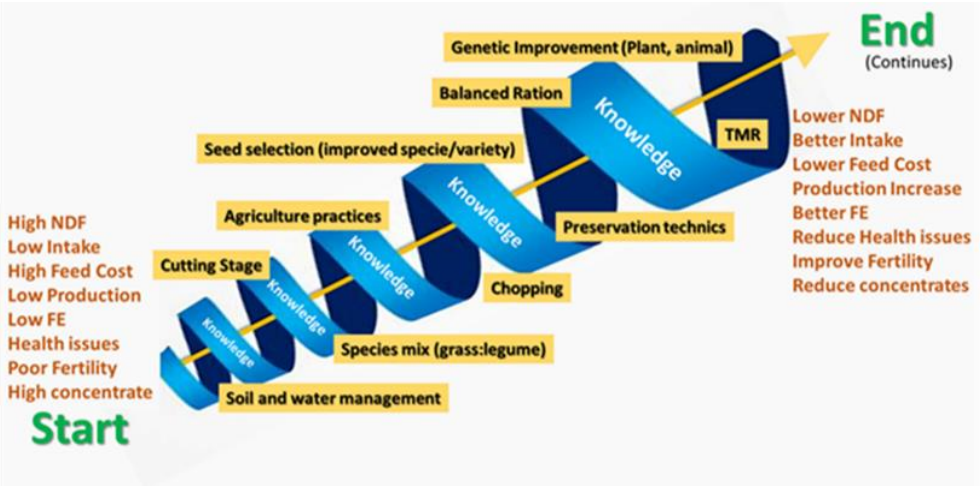

Figure 4. Quality Forage Road Map - Vision for 2030

Population pressure causing expansion of arable land for food crop production, residential or commercial use, seasonality in availability of pastures and forages, and lack of knowledge on forage preservation, call for alternative ways of forage production, preservation and use. Sustainable livestock and crop production in East Africa can be achieved if drastic changes in livestock and land management systems are carried out as outlined in Figure 4. This requires a more efficient integration of livestock and cropping systems, opening up domestic markets for improved forage seed varieties adapted to or from similar (tropical) environments abroad, and a shift towards more intensive forage production and feeding systems, with more emphasis on cut and-carry feeding, forage preservation, commercial forage production outside the main dairy milk sheds where land is still available and less costly (midlands), and rotational grazing, particularly in the lowland areas.

Acknowledgements

This policy brief is based on 3 working papers or Forage Quick Scans of the forage sub-sector in Kenya, Ethiopia and Uganda. The working papers cover a wide range of aspects, from availability of forage species and mechanization, to input and service supply, to more institutional aspects: the forage market, education and training, environmental footprint, and policy framework. The working papers provide recommendations for the dairy sector aimed at enhancing the availability of quality forages and pastures. They are part of Theme 2: Forages and Dairy Nutrition of the Netherlands East African Dairy Partnership project (NEADAP), an initiative of the Dutch government for learning and sharing amongst different dairy sectors and projects in East Africa.

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