



Regional Dairy Policy Brief

“Dairy the motor for healthy growth”

**East Africa’s Forage Sub-Sector
Pathways to intensified sustainable
forage production**



In East Africa, the dairy sector has an 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 stemming from relaxed management practices and limited availability of improved pasture, forage seeds and planting material, there is seasonality in the quantity and quality of forage available. Most areas experience an acute shortage of supply during the dry season and the available forage during this period is of very poor quality. At present, the *feeding costs of East Africa dairy farmers represent 60-70% of the total production cost of one litre of milk*. This brief lists a number of solution areas to overcome this constraint.



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 Forwards

Forage quality and scarcity have been identified as amongst the key factors determining the growth and competitiveness of dairy (and beef) production and the livestock sector at large. Current innovations need to be scaled-up and others introduced and fast-tracked. These innovations need to address improvement of forages, forage related inputs, *especially improved forage seed*, and service provision visualized in figure 2. These will positively affect the adoption rate of improved forage technology by farmers, to create a positive impact on the farm operations in general and on feed efficiency of the dairy cow in particular, to realize the cow's production potential.

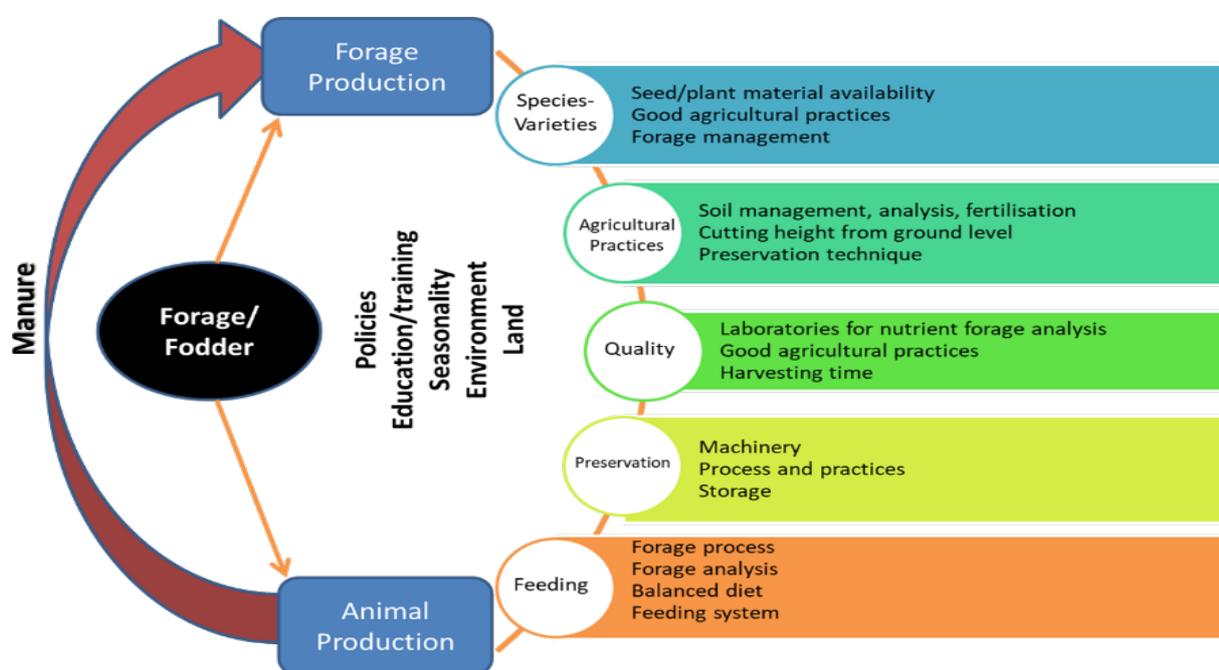


Figure 2. Full package concept of dairy farming approach

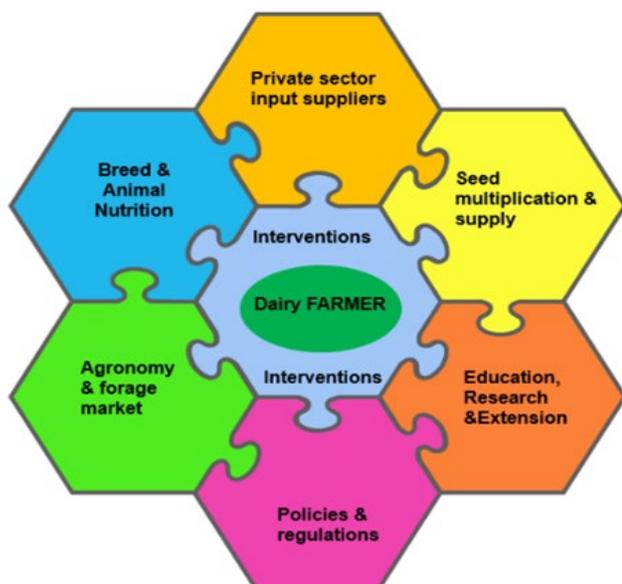


Figure 3. Diagram of interventions in the forage value chain

These innovations in various parts in the forage value chain should address a number of topics, putting the farmer in the centre, as visualised 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, 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 chain with the aim to intensify forage production 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 (other) private sector investments in the forage sub-sector.

A simple economic analysis (Table 1) shows how improvement of forage quality could be an important driver to increase animal performance and profitability and reduce enteric methane emission.

Forage crop & cutting stage	Forage Quality	Milk Production litres/day	Enteric Methane Emission CH ₄ 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 relationship with i) Milk production, ii) Enteric methane emissions and iii) Profitability, all for a 500kg lactating cow under Kenyan conditions. (Source: Quick scan of Kenya’s forage sub-sector, 2019)

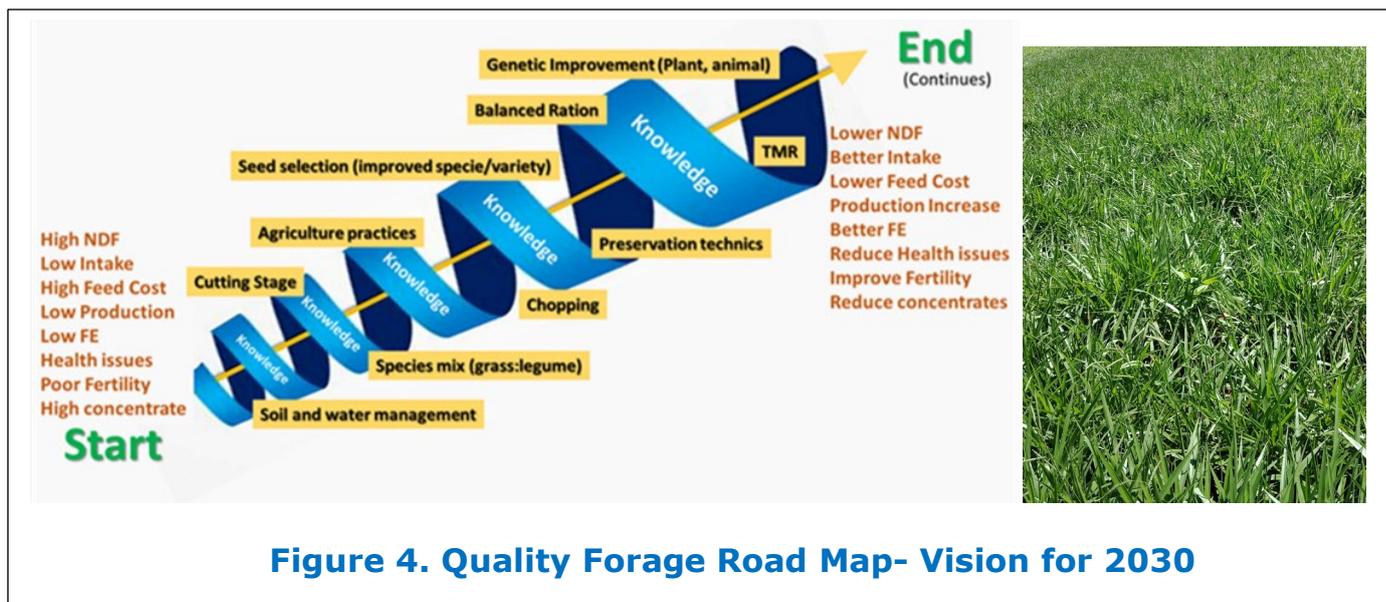


Figure 4. Quality Forage Road Map- Vision for 2030

Population pressure on crop land expansion, seasonality in availability of pastures and forages, and lack of knowledge on forage preservation call for alternative ways of forage production, conservation 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, better proven genetics, and a shift towards more intensive feeding systems, with more emphasis on cut and-carry feeding, forage production in the midlands and highlands, and rotational grazing, particularly in the lowland areas.

Acknowledgements

This policy brief is based on three working papers of the forage sub-sector in Kenya, Ethiopia and Uganda. The papers cover a wide range of aspects, from technical aspects such as available 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 papers provide recommendations for the dairy sector, aimed at enhancing the availability of quality forage. The papers are part of Theme 2: Forages and 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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