



Addressing the feed deficit of the semi-arid Taita Taveta County of Kenya

Mureithi, JG.; Mwabili, HN²

¹ Director, African Conservation Tillage Network, P.O Box 10375 - 00100, Nairobi, Kenya, mureithijg@gmail.com.

² Director of Livestock Production and Fisheries, Taita Taveta County, Kenya, P.O Box 1066 – 80304, Wundanyi, hmnyambu@gmail.com.

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Abstract

Livestock production is a key economic sector in Taita Taveta County, and accounts for over 40% of agricultural earnings. The demand for animal source foods is on the rise due to increasing human population and the expanding middle class. The main livestock types kept include cattle, goats, sheep, camels, donkeys and poultry. The main feeds include roughages but climate change has adversely affected pasture and fodder production in cultivated and natural vegetation systems. According to a national feed inventory and feed balance assessment conducted in 2019, the County had a feed deficit of 23% based on livestock dry matter (DM) requirements. The deficit was further exacerbated to about 60% by a prolonged drought experienced in 2022. To promote growth of the county feed industry, a 10-year Animal Feed Strategy was developed. The strategy aimed at bridging the feed gap, and enhancing livestock numbers and livestock products by addressing challenges in the feed industry. The strategy also sought to ensure rangeland resources were managed sustainably as well as guided decisions in land use planning and investments. To meet the feed requirements by the tenth year of the strategy, USD \$282.2 million was to be spent to produce 5.74 billion metric tonnes of DM feeds. The industry was to realize an annual net income of USD \$133 million and create 6,000 jobs.

Introduction

The potential for livestock production in Taita Taveta County was high due to expansive rangelands covering 24% or approximately 4,100 km². Ranching was a major production system for beef cattle rearing. Red meat production was mainly from ruminant livestock reared under an extensive farming system while dairy cattle were reared in the hilly areas under small-holder farming systems. The estimated livestock population for 2022 and projected growth up to 2032 is shown in Table 1.

Table 1: County Livestock Statistics 2022 and Projected Growth up to 2032

Livestock		Year		
		2022	2027	2032
Dairy		32,587	34,761	37,080
Beef		149,905	191,321	244,179
Sheep		63,994	112,779	198,756
Meat goat		346,358	638,142	1,175,736
Dairy goat		6,070	6,768	7,546
Pigs		2,259	3,168	4,443
Rabbits		14,870	20,661	28,709
Chicken	Broilers	45,207	90,927	182,888
	Layers	94,643	190,361	382,884
	Indigenous chicken	647,080	1,301,509	2,617,799
Donkeys		3,704	4,010	4,341
Camels		1,319	1,428	1,546

Source; Taita Taveta County Animal Feed Strategy, 2022 – 2032 (2023)

A County animal feed inventory and feed balance analysis in 2019 indicated an overall dry matter feed deficit of 23% and crude protein and metabolisable energy deficits of 42.9% and 50.6%, respectively. To address this deficit, the County developed a 10-year animal feed strategy (AFS) for the period 2022 to 2032.

Strategy development methodology

A County Livestock Technical Working Group (TWG) was formed mainly comprising of animal production and animal health technical personnel. The group was trained through a series of facilitated workshops by a team from Kenya’s State Department of Livestock (SDL) in the process of developing the strategy, including data collection and writing. The SDL had formulated a standard framework for developing animal feed strategies. The data included, human population trends, per capita consumption of animal source foods, livestock types, feed requirements, potential feed resources, cost-benefit analysis of producing feeds and potential feed business cases / investment plans in the county.

Estimating demand for animal source foods based on County per capita consumption

The county’s human population in 2022 was 360,000 and its projected growth for the strategy period was 385,800 by 2027 and 407,280 by 2032 (Kenya National Bureau of Statistics census, 2019). This growth was expected to increase demand for animal source foods based on the county annual per capita consumption (Table 2). The per capita consumption were based on the following estimates of annual consumption: milk 220L, beef 9 kg, mutton 2.4 kg, chevon 2 kg, chicken 12 kg, pork 0.8 kg and 180 eggs.

Table 2: Total estimated demand and supply of animal source foods in the County

Year	Milk (Million Litres)		Meat (Million Kg)		Eggs (Millions)	
	Estimated demand	Estimated supply	Estimated demand	Estimated supply	Estimated demand	Estimated supply
2022	79.2	21.5	9.4	0.99	64.8	61.3
2027	84.8	43.1	10.1	14.5	69.4	115.7
2032	89.6	86.4	10.6	16.5	73.3	122.2

To supply the required animal source foods (Table 2), the county livestock was to be fed with sufficient feed resources to meet their nutrients requirements. These feeds were to be grown in the county by entrepreneurs developing agribusinesses. The County government was to provide an enabling policy environment.

Animal Feed Resources

Priority feed resources/value chains for the county were identified in addition to the natural pastures that supplied the bulk of livestock feed (Table 3). They were selected based on their adaptability to the local conditions and potential to increase their yield.

Table 3: Production Estimates of Animal Feed Resources in 2020 and Projected Demand by 2032

Feed Resources	2020	2027	2032
	Metric tonnes	Metric tonnes	Metric tonnes
Energy Sources			
Hay	66,285	301,385	459,916.1
Fodder grasses	19,885	52,479	80,641
Maize grain	16,609	113,434	203,671
Sorghum	567.6	1,723.5	3,449.3
Protein sources			
Sunflower seed cake *	15,427.9	36,669.9	55,919.8
Legume fodder	9,279.90	10,495.8	14,233.6
Sweet potato vines	2,651.4	7,871.8	13,720.3
Groundnuts	456.0	1,332.4	2,629.4
Animal protein Sources			
Black Soldier Fly Larvae	190.7	516.2	804.4
Natural grazing			
Field-based feed resources**	1,915,839	2,841,696	4,622,221
Total	2,047,191.5	3,367,603.6	5,457,205.9

* 95% of the sunflower seed cake was imported from outside the county.

** Acreage for field-based feed was to remain constant over the period but productivity per unit was expected to increase as a result of improved management.

Source: Taita Taveta County Animal Feed Strategy, 2022 – 2032, 2023.

Investments Plans

These plans were based on the cost-benefit analysis of developing the feed value chains to meet county demands as shown in Table 4.

Implementation of the Strategy

Implementation of the strategy was to cost approximately US\$282.44 million over a period of 10 years. A detailed implementation framework with clear stakeholder roles and responsibilities and a monitoring and evaluation framework, at all levels of implementation, was developed. The County Department of Agriculture, Livestock, Fisheries, and Irrigation was to lead the implementation in collaboration with other relevant agencies and stakeholders. Upon the full implementation of the strategy, the feed value chains were expected to generate a net income of US\$133 million and create 6,165 salaried jobs.

Table 4: Feed Commodity Cost-Benefit Analysis and Value Proposition to Investors

Value chains	Input Analysis		Output Analysis		Job creation ¹
	Hectares	Metric Tonnes	Total cost (Million US\$)	Annual Net Income (Million US\$)	
Energy Sources					
Hay	137,836.7	459,916.1	85.38	17.08	793
Maize Grain	38,781.4	203,671	29.46	5.89	274
Forage Grasses	4,869.6	80,641	9.32	1.86	87
Sorghum Grain	2,791.9	3,449	2.14	0.43	20
Protein Sources					
Sunflower Seed Cake	8,0821.3	199,714	74.90	82.39	3,825
Legume Fodder	1,367.8	6,490	1.33	2.35	109
Sweet Potato Vines	5,552.3	164,640	12.76	2.55	118
Groundnuts	1,418.4	1,647	1.08	0.22	10
Animal Protein					
Black Soldier Fly Larvae	1.8	135	0.06	0.22	10
Natural Grazing					
Field-based feed resources	599,689.5	4,622,221	66.01	19.80	919
Total	873,130.6	5,742,524.1	282.44	132.79	6,165

¹It was assumed 30% of net income was used for job creation at an annual salary of US\$6,462 per job created.

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