

## LIVESTOCK FEEDS ASSESSMENT REPORT FROM KISII COUNTY-KENYA



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## Introduction

In order to characterize livestock feeding, we carried forage assessment in Kisii County, Bomachoge Chache sub-county, involving women and men groups separately, to get a picture of how livestock feed status including feeding and production stands. We choose the county as one of the Kenyan highlands with agricultural potential including livestock. Following advice from Kisii county Ministry of Livestock on, areas practicing dairy activities and have functional farmer groups including dairy cooperatives in the county, we ended with Bomachoge chache sub-county. Largely, Kisii is divided into eight sub/counties including; Kitutu Chache North, Bonchari, South Mugirango, Bobasi, Bomachoge chache, Nyaribari chache, Nyaribari Masaba and Kitutu Chache South. The findings were to inform the Netherlands funded project: *Feed and forage seed business models to support further professionalization of the dairy sector in Kenya and Uganda -2019- 2022*.

## Approach

We started by training the enumerators drawn from research- Alliance Bioversity-CIAT (ABC) and Ministry of Livestock in Bomachoge Chache sub-county as stipulated in (Table 1). The training entailed use of G- FEAST tool (<https://cgspace.cgiar.org/handle/10568/100243>) adapted to capture gender opinion especially for women and men, on livestock activities in a given livestock context.

Table 1. Attendants of G-FEAST training in Kisii on 5 February 2020 at Bomachoge chache sub-county livestock office

Name of Enumerator	Affiliation
Ruth Odhiambo	ABC
Fredrick Muthomi	ABC
Victor Otieno	ABC
Zabron Ndubi	Livestock officer - Bomachoge chache
Geoffrey Siriba	Agribusiness Officer - Bomachoge chache
Solomon Mwendia	ABC -Trainer



Enumerator training at Bomachoge chache livestock office

We carried the exercise separately for women and men reason being, when put together usually women rely on the men to provide information, and often women opinions left out. Culturally, men are the household heads and women expect them to respond to issues pertaining the household.

## Results

### *Inferences from women*

Women perceived land holding categories as; small <1 acres, medium: 1 to 3 and large Farm: 3 acres and above. Majority of the households according to the women are the medium sized comprising >85% while both large and small constitute about 10% Figure 1.

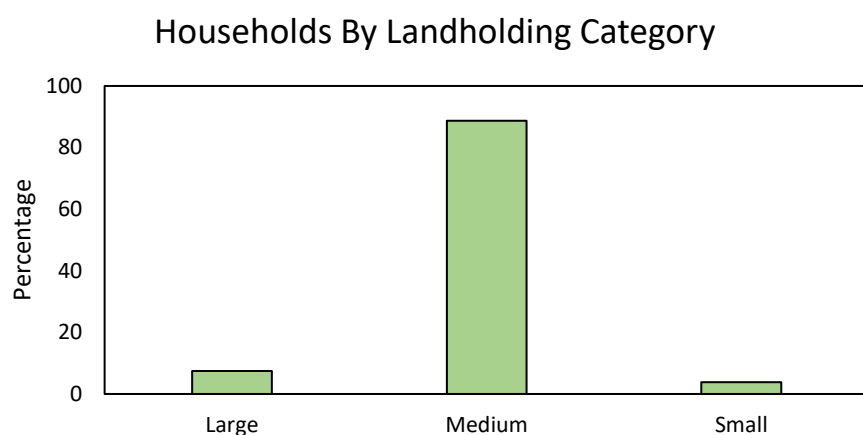


Figure 1. Percentage land holdings in Riokindo are as perceived by women during the focused group discussions (FGD) in Kisii.

Improved lactating dairy cattle had the highest Total Livestock Units (TLU) of  $\sim 1.38$  while goats had the least of  $\sim 0.2$  (Figure 2). This indicates the order of preference of livestock by households as perceived by women.

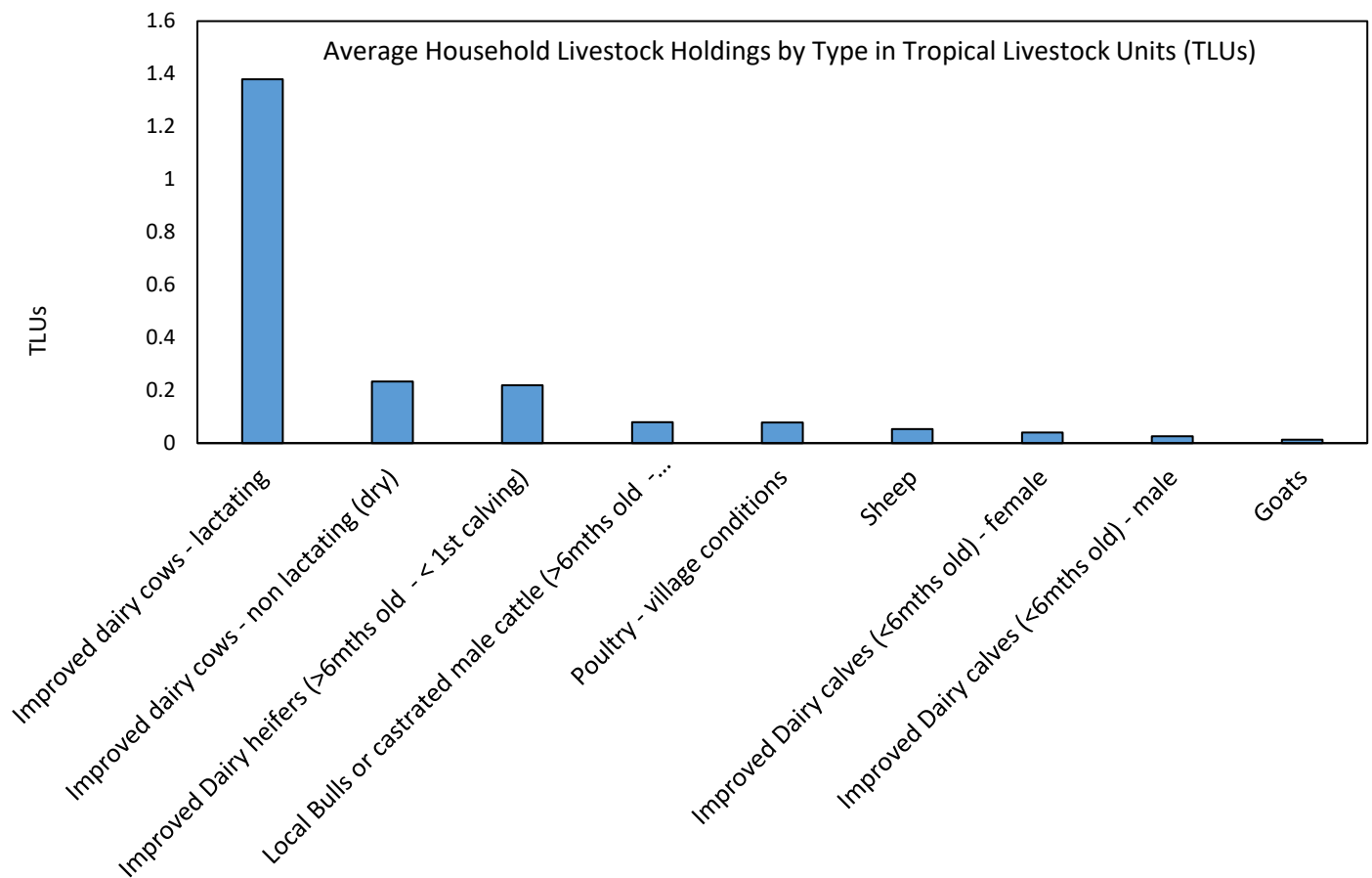


Figure 2. Total livestock units across households as perceived by women in the study site

General crops grown in the area constitute maize, tea, bananas, common beans, and sweet potatoes, and in that order of decreasing land allocation. However, maize and tea get similar land allocation of approximately 0.2 ha.

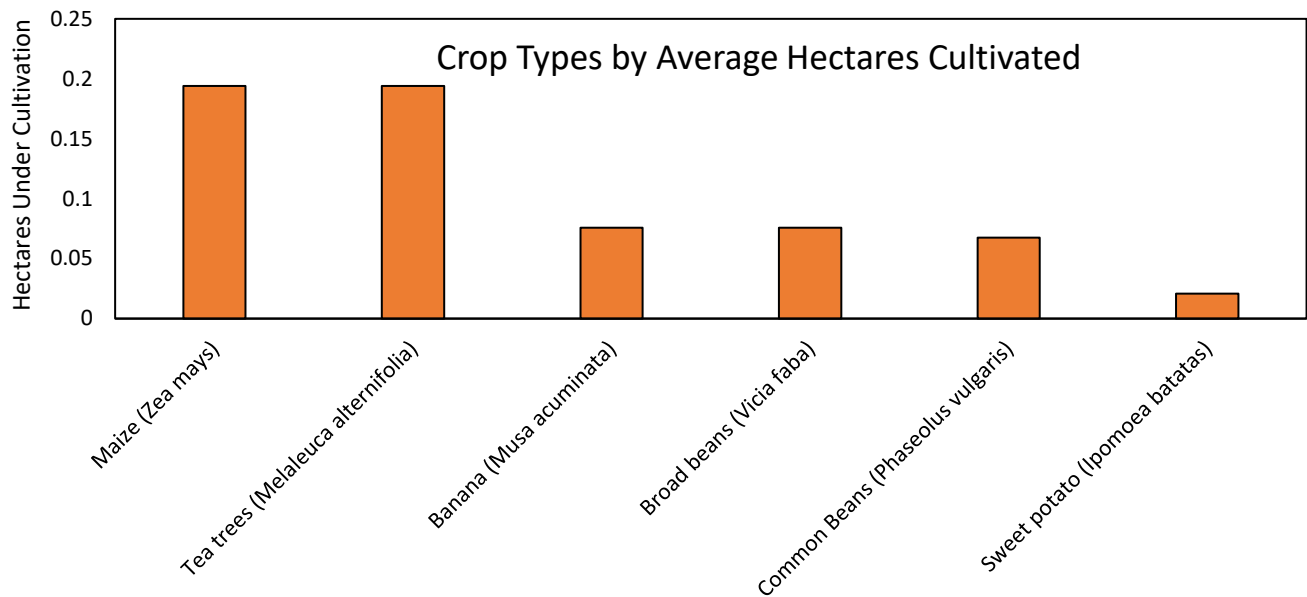


Figure 3. General crops grown around Riokindo by land allocation (ha), Kisii

Among the cultivated fodder crops, Napier grass takes the lead followed by *Calliandra*, a forage legume tree, then Kikuyu grass. Due to the small land holding in the areas, the land allocated for Napier grass is generally low.

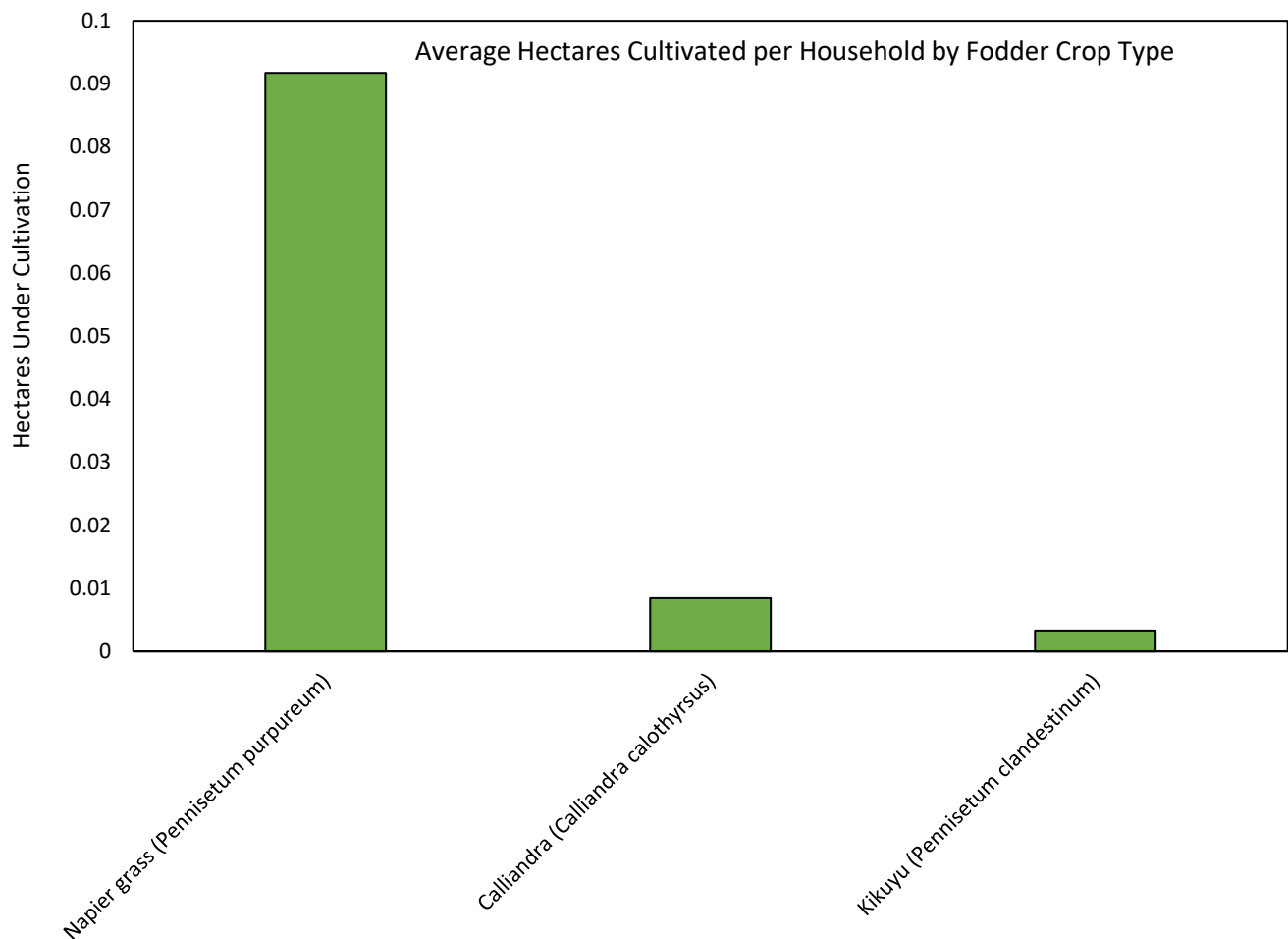


Figure 4. Cultivated fodder crops in Riokindo area, Kisii

Cultivated fodder, and by extension Napier grass, provide most of the dry matter intake 42% similar to metabolizable energy and crude protein to the livestock (Figure 5).

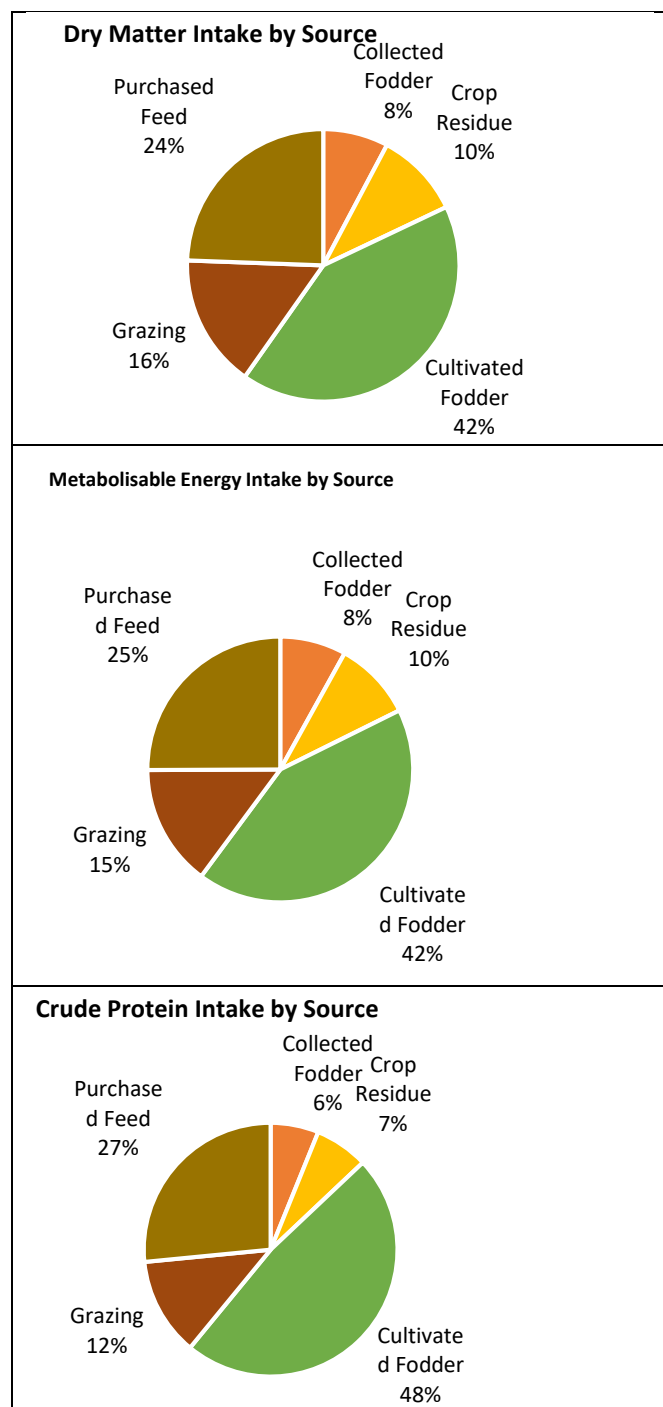


Figure 5. Sources of dry matter, metabolizable and crude protein intakes in Riokindo area, Kisii County

Generally, the area receives rainfall in bimodal pattern with most rainfall occurring in the months of April then in the month of August. It is only in January reported driest with no rainfall (Figure 6). Green forages contributes the most basal diet, followed by crop residues, then leguminous crop residues.

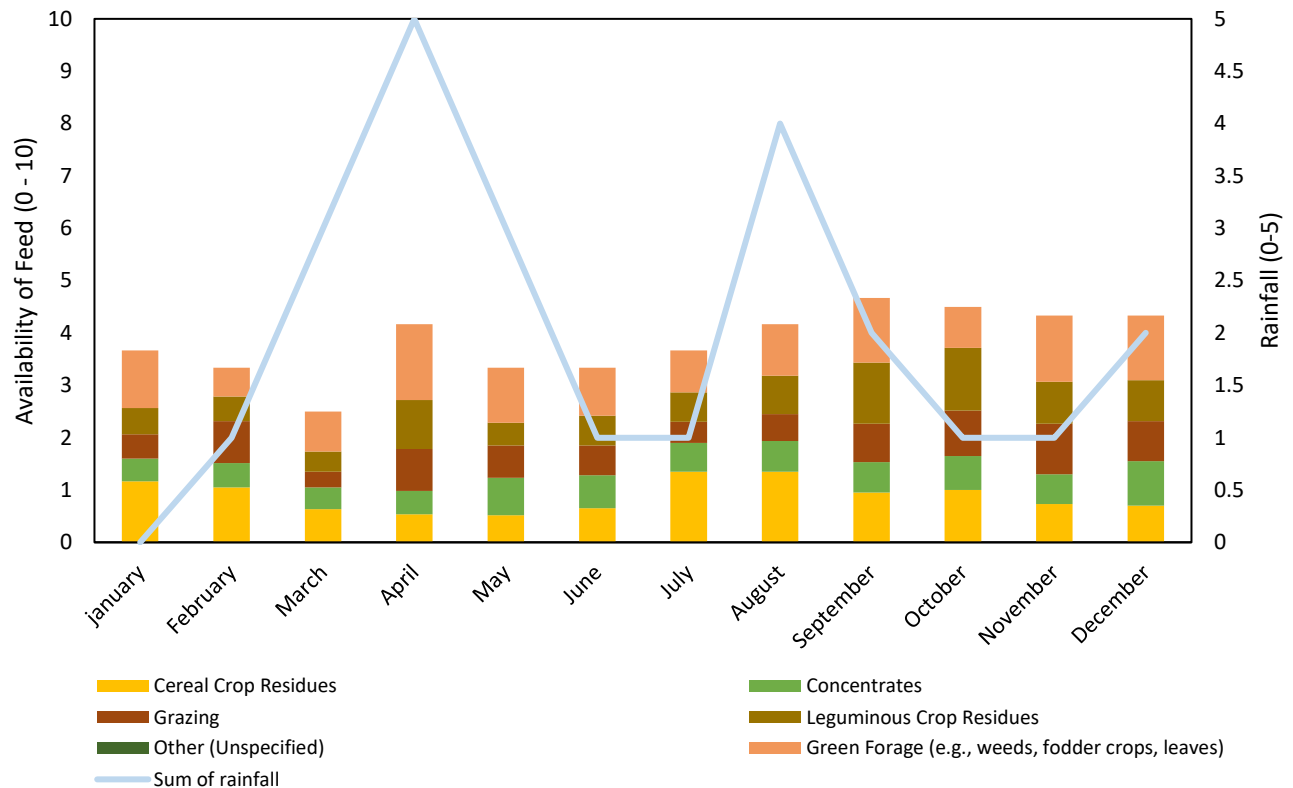


Figure 6. Sources of animal feeds and rainfall scores (0-5) in a calendar year as enumerated by the women in Riokindo, Kisii County

The average price for cattle, sheep and goats generally increased from January to December (Figure 7). At no time is the price for sheep higher than that of goat. Within the year, the price variability is high ranging USD 250-425 (cattle), 40 -100 (goat) and 22 – 70 (sheep).

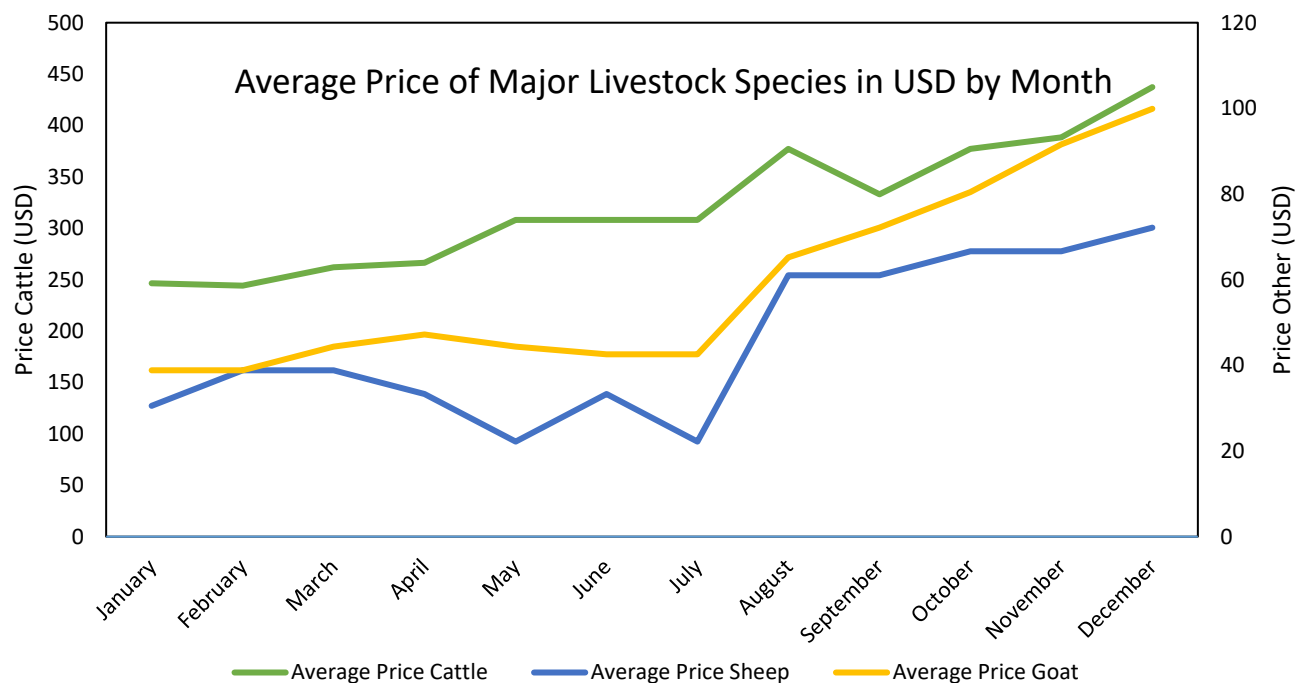


Figure 7. Average price of cattle, sheep and goats in Riokindo area, Kisii County as perceived by the women.

Milk production and prices vary with the area (Figure 8). The most milk production is about 10 liters at the beginning of the calendar year that drops gradually to about 6.5 liters by December. Milk price per liter stagnates at 0.37 USD from January to July before dropping in August followed by steady increase to 0.38 by December. The increase or drop in milk prices follows the rule of supply and demand i.e. going high when supply is low, and vice versa.

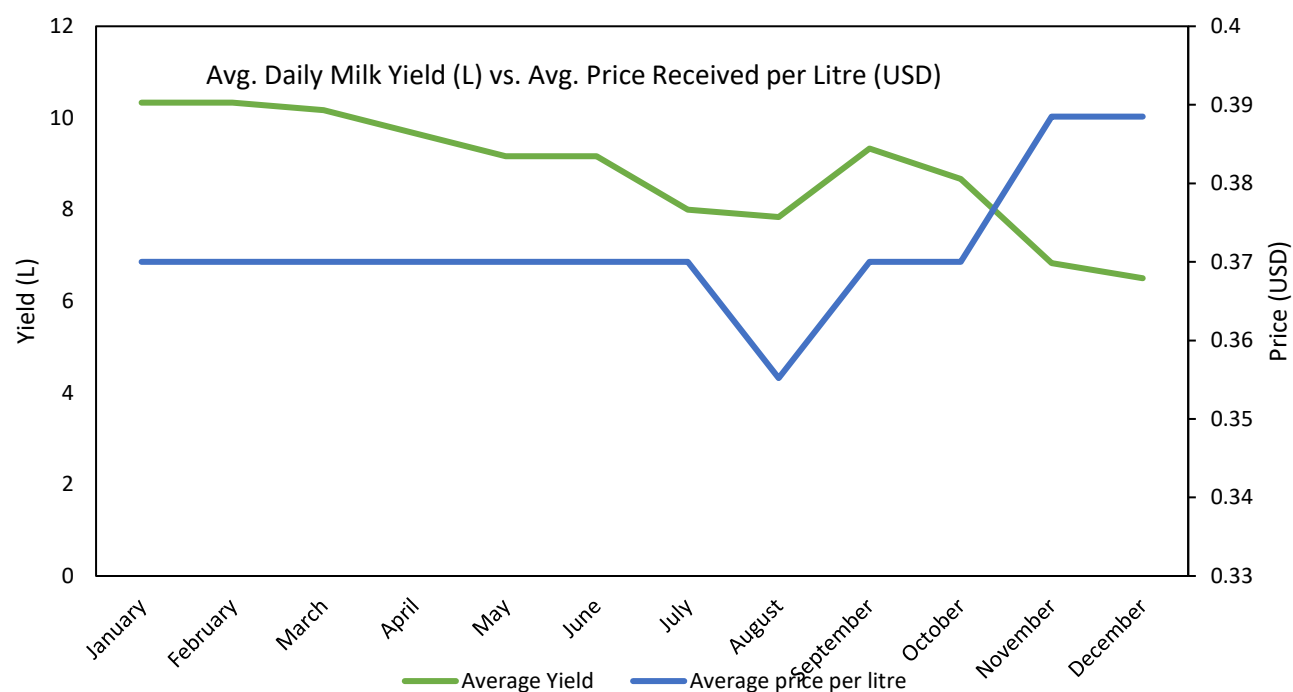


Figure 8. Average milk yield and prices across a calendar year in Riokindo, Kisii County as perceived by women

Cropping and livestock combined take 70% of the household income, an indication farming is the key income earner for families in the area of study (Figure 9). Efforts to improve farming efficiency for both livestock and crops therefore, would benefit the communities in the areas of study and other similar setup

**Average Household Income by Activity Category**

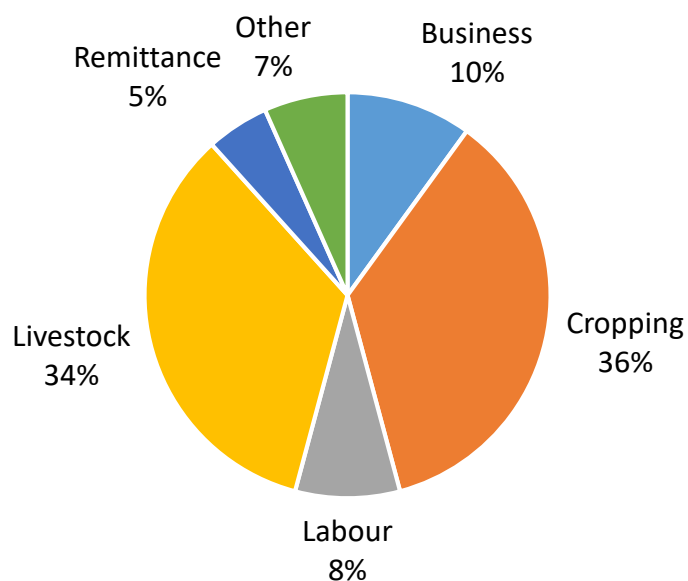


Figure 9. Percentage contribution by different activities towards household incomes in the study area as perceived by women in Riokindo, Kisii County

The average daily labor rates are lower for women compared to men averaging at 1.3 US dollars for a woman per day, and 1.7 USD per day for a man, hence a difference of 30% lower for women (Figure 10).

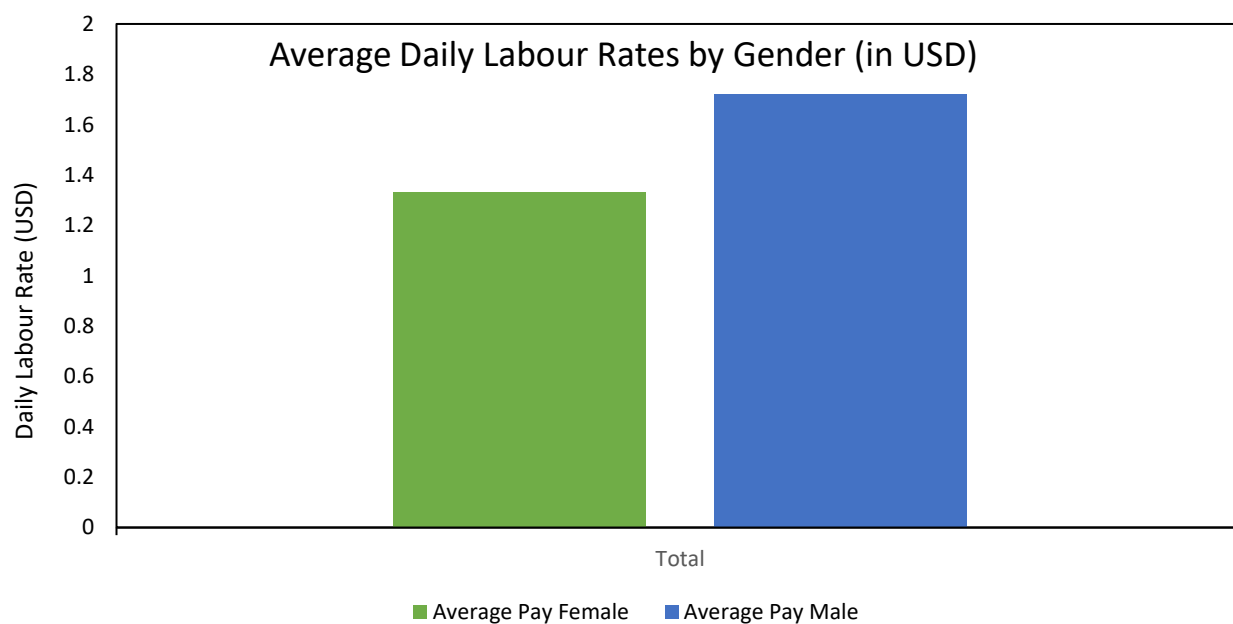


Figure 10. Average daily labor rates for men and women as enumerated by women in Riokindo, Kisii County.

### *Inferences from men*

Unlike for the women, men identified land categories (acres) as follows. Those considered small ranged  $<0.5$ , medium  $0.5 > 3$  and large  $>3$  (Figure 11). The categorization by men put most of the households in smallholdings (50%), medium 30% and 20% for the large. Land categorization notwithstanding, it is at convergence for women and men that most households own between 0.5 to 3 acres to the tune of  $>80\%$  of the households.

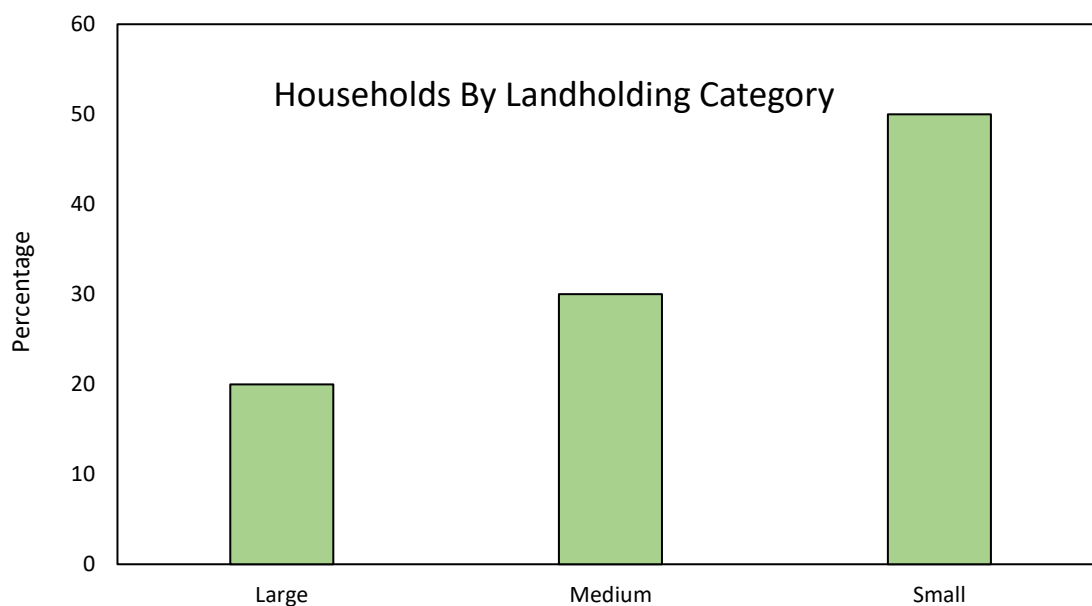


Figure 11. Perceived land categorization by men and households proportionate in the study area, Riokindo Kisii County.

Total livestock Units in the study site as considered by men put improved lactating cows the highest (1.4 TLUs) and least (0.06 TLUs) for improved male dairy calves less than 6 months old (Figure 12). The gap between lactating dairy cows and the second in ranking i.e. improved dairy heifers (>6 months old and less than 1<sup>st</sup> calving) is wide being at 4 times as high for lactating improved cattle. This was very much similar to women observation in the same area (Figure 2).

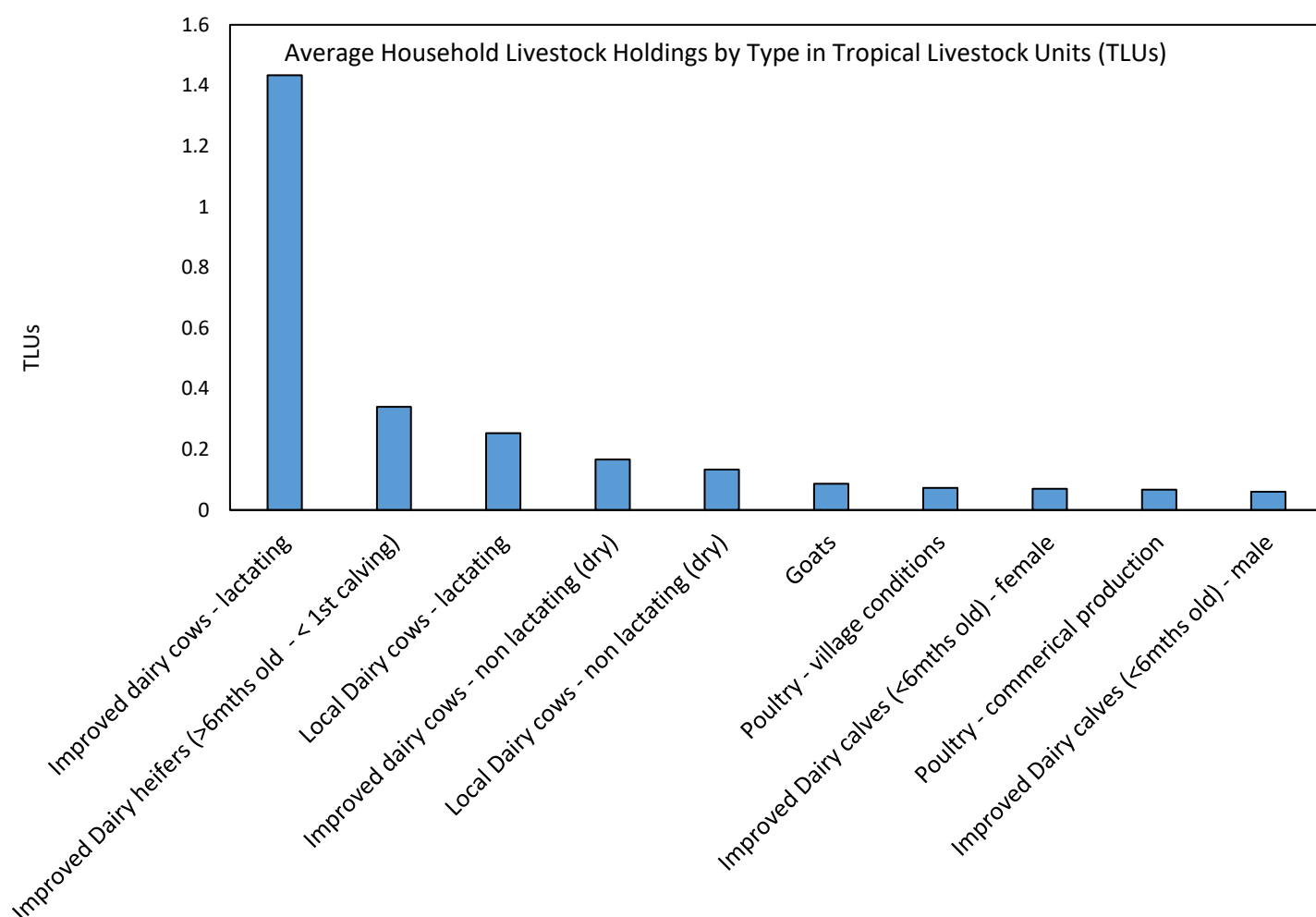


Figure 12. Average household livestock holdings in TLUs as viewed by men in Riokindo, Kisii County.

Crops type by the average ha of cultivation were in the order maize > bananas > beans > tea > kales (Figure 13). Maize takes about 0.25 ha and 0.12 for bananas, while the least kales, takes 0.06 ha. While women equally identified maize as the crop taking most of the land allocation, men found banana to follow maize and women tea. Only men did not identify sweet potato as a crop grown in the area suggesting it could be a women crop.

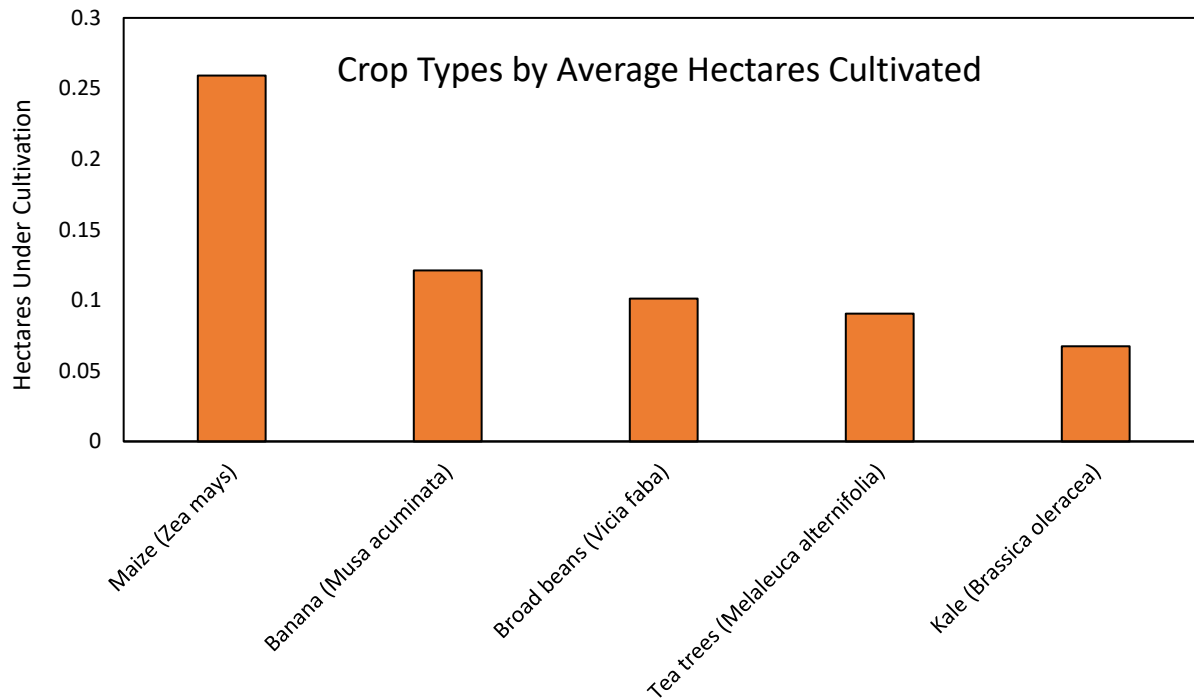


Figure 13. Crops and land allocation according to men in the study area, Riokindo, Kisii County

Forage cultivation in the area is limited to few grasses and in small portions of land just like the crops (Figure 14). Forage supply in decreasing order is from the following grasses; Napier grass > *Brachiaria* > Rhodes grass > maize. Napier grass, land allocation is at least 3.8 times that of *Brachiaria*, the second forage crop cultivated in the area.

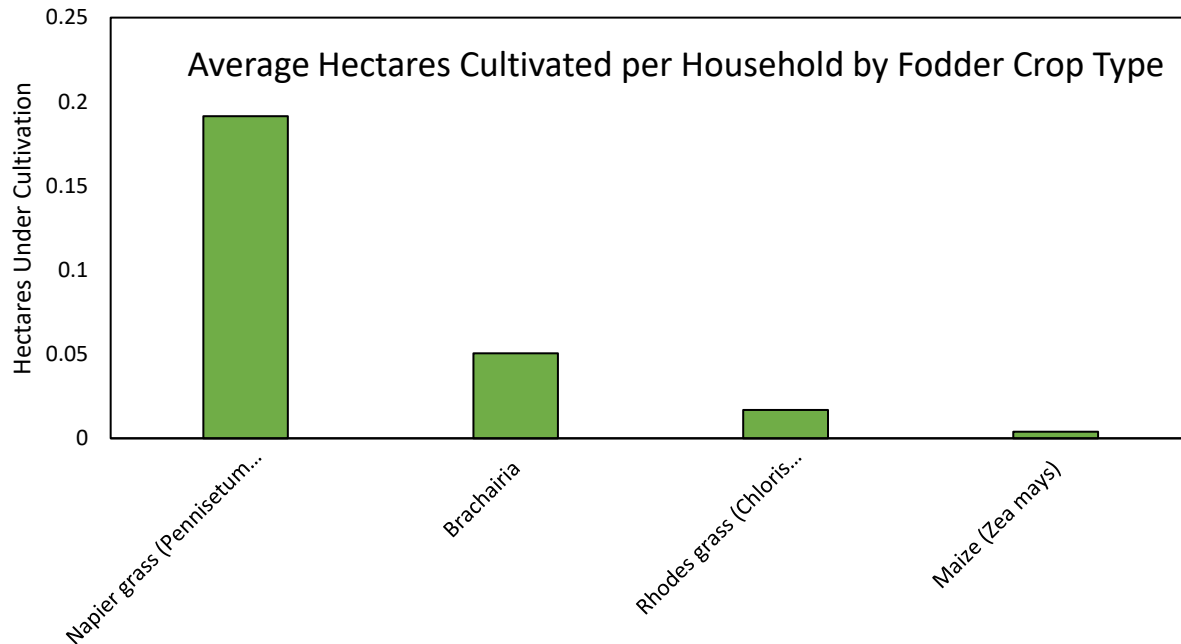


Figure 14. Cultivated forages by land allocation as perceived by men in Riokindo area, Kisii County

Cultivated fodder contributes most of the dry matter, metabolizable energy, and protein accessed by livestock (Figure 15). Crop residues follow with 16% contribution at most, for dry matter intake. The current fodder cultivation means the farmers are already aware of the need thus easier entry with use of better forages as farmers already used to forage growing. As enumerated earlier, most of the forage come from Napier grass, which is good for dry matter production but has its own limitations including low quality and prone to diseases (smut, stunt) and yellow aphids in Kisii area. Livestock production officer in the area of study- Bomachage chache sub-county (Zabron Ndubi) reported on the yellow aphids attack, not observed in other Napier growing regions in Kenya.

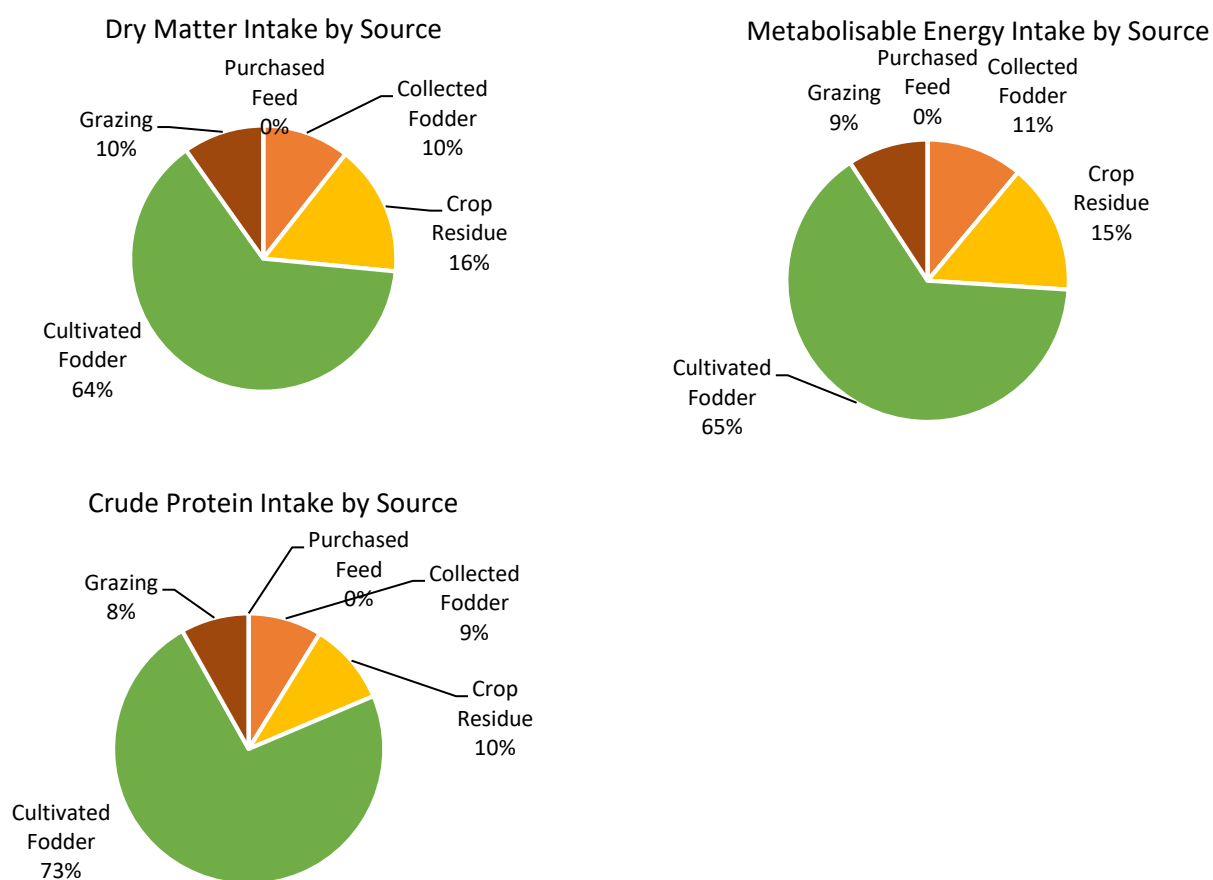


Figure 15. Percentage contribution of various feed sources to livestock dry matter intake, metabolizable intake and crude protein intake by in Riokindo area, Kisii County

The area is characterized two main rain seasons, March–May and September–October (Figure 16) much similar to what was reported by women. Availability of livestock feeds follows rainfall pattern, therefore being most abundant in April–May season. It is noteworthy not at any month men accorded highest score of 10, suggesting forage is never enough even during and soon after rain seasons, a similar pattern as that of the women (Figure 6).

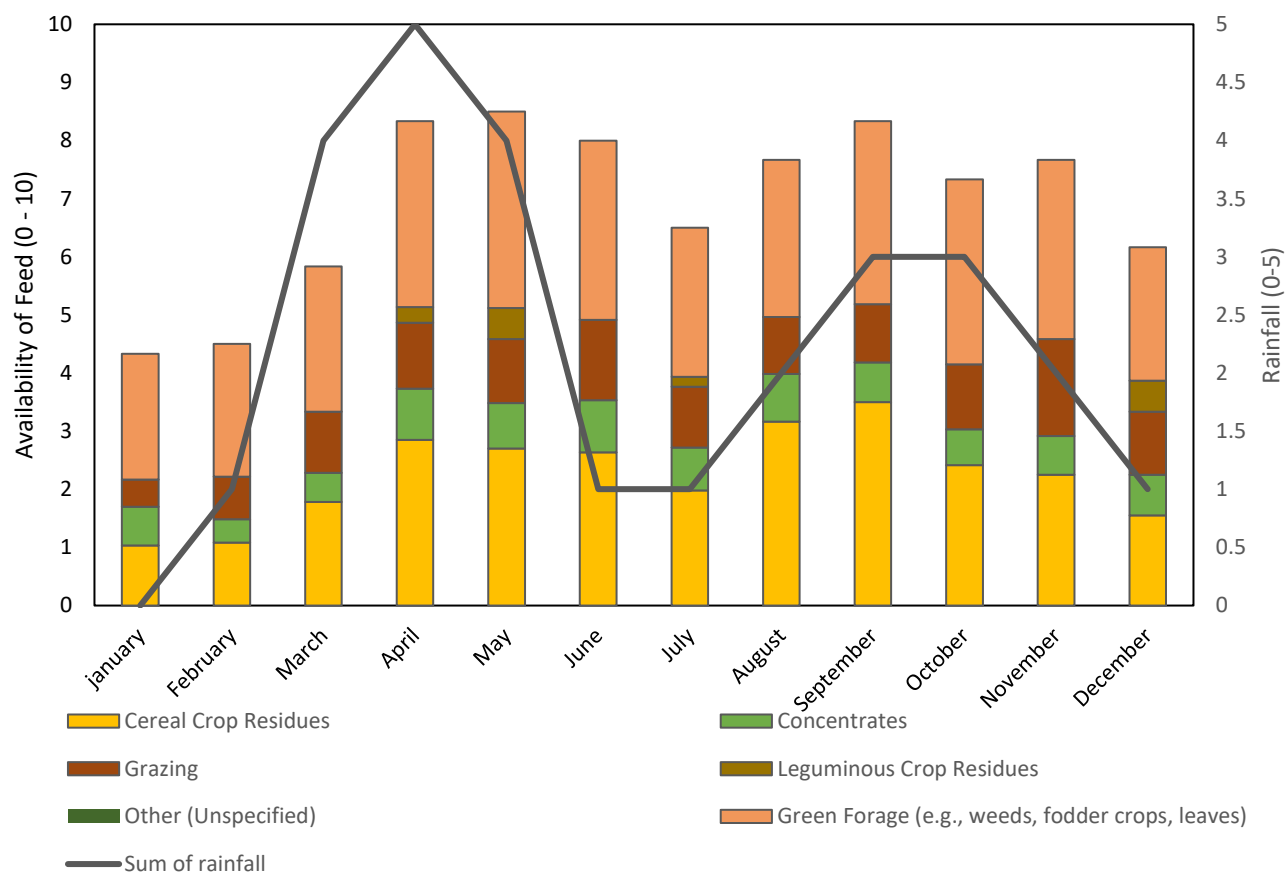


Figure 16. Livestock feed availability and rainfall scores as enumerated by men in Riokindo area, Kisii County.

Average price for the major livestock species (cattle, sheep, goats) in the area increase gradually from the beginning of the year to December (Figure 17). Similar to women observation, at no time did price for sheep surpass that for of goat. The price for cattle ranged USD 325–620.

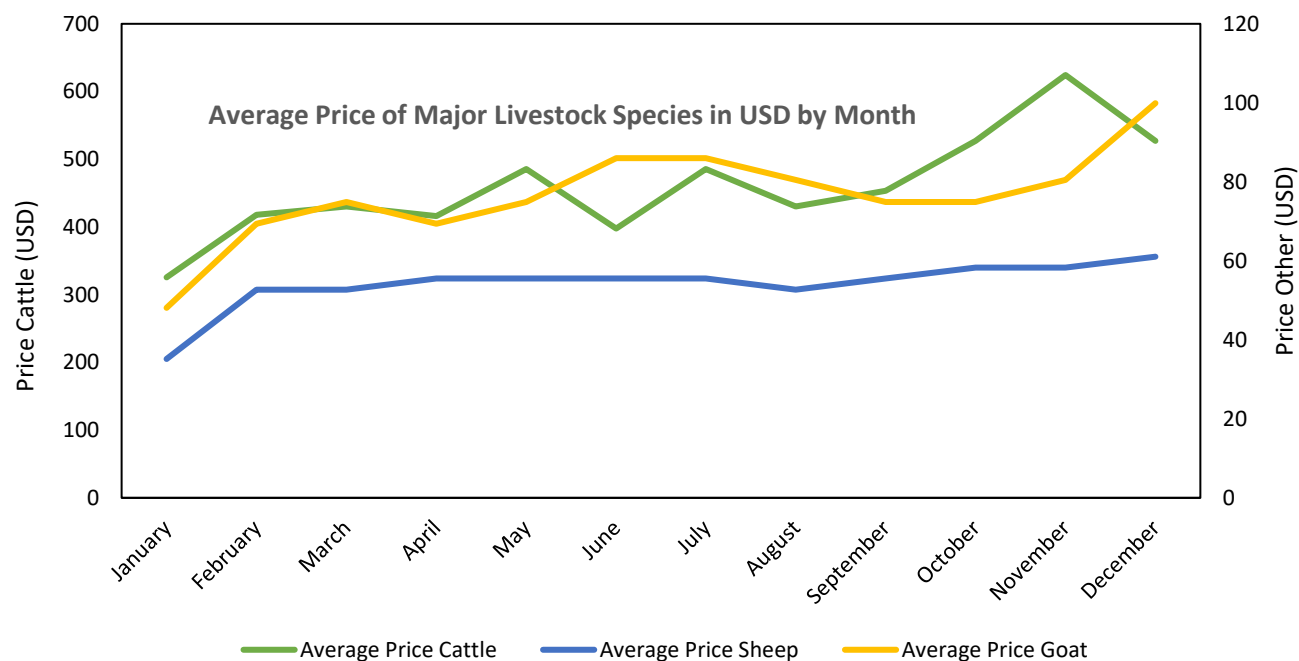


Figure 17. Monthly prices for the major livestock as viewed by the men in Riokindo, Kisii Sub County

Generally, milk production is generally higher at the beginning of the year dropping gradually until December (Figure 18). The milk prices follow the reverse of production owing to the rule of demand and supply. At peak production, the average production is about 6 liters of milk before dropping by 50% to about 3 liters in December. However, milk prices (USD) per liter is lowest in February (0.26) peaking to 0.44 in July before dropping to 0.29 by December. While the trend for both production and prices are similar to those of women (Figure 8), the levels of both production and prices are higher for women than men.

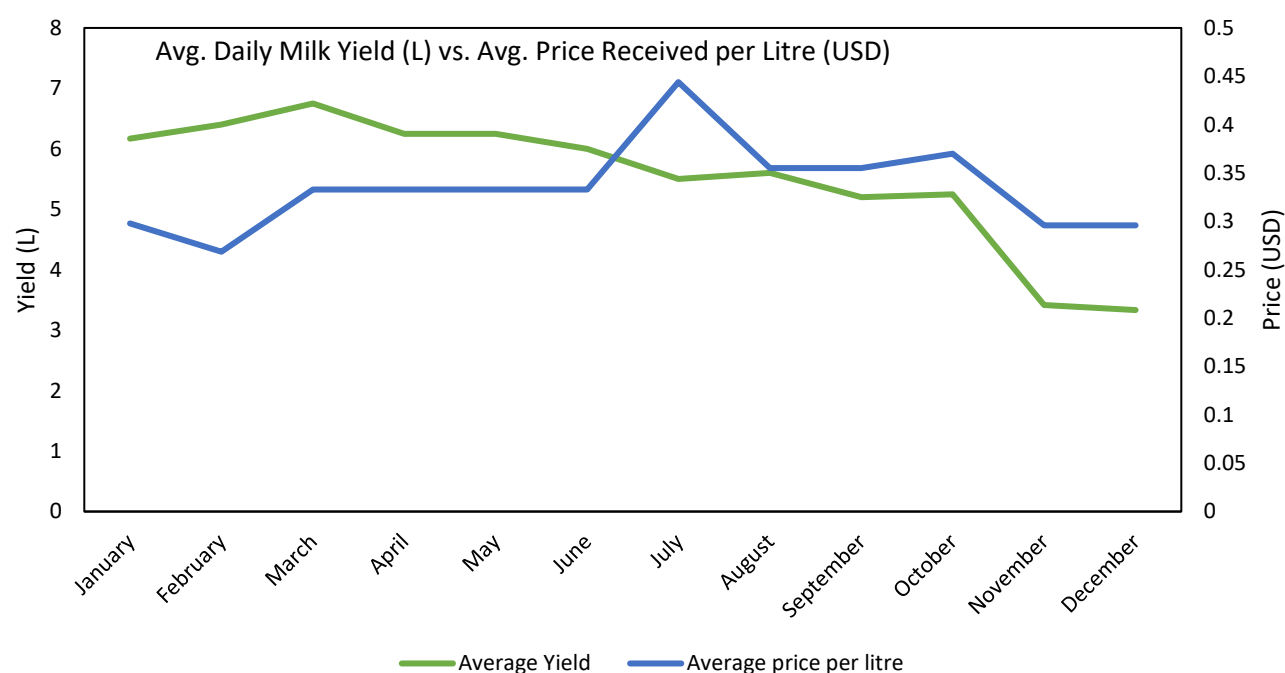


Figure 18. Monthly average milk production and prices in Riokindo areas as perceived by men

The household incomes largely depend on cropping that takes up to 57% as reported by men (Figure 19). Livestock comes next followed closely by businesses at 22 and 18 percentage respectively. Unlike for the women (Figure 9), cropping according takes a larger share income compared to women who put it at 36% in close proximity with livestock at 34%. It appears men mostly do not go for hired labor for income as this was not motioned by men, while according to women 8% of household income come from labor.

### Average Household Income by Activity Category

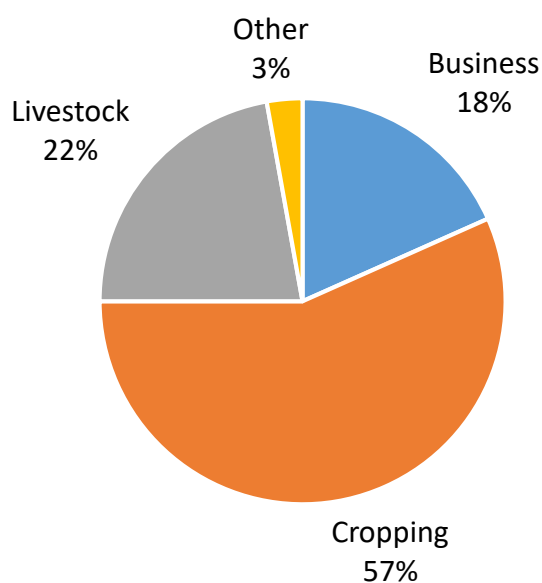


Figure 19. Household sources of incomes (%) as viewed by men in Riokindo area, Kisii County

When taking paid labor is considered, the pay appeared to differ for men and women as perceived by men. Women receive less pay at USD 1.5 while men gain 1.9, a difference of about ~27% lower for women. A similar trend as reported by women (Figure 10), though at 1.3 and 1.7 USD for women and men respectively and a variance of ~30%

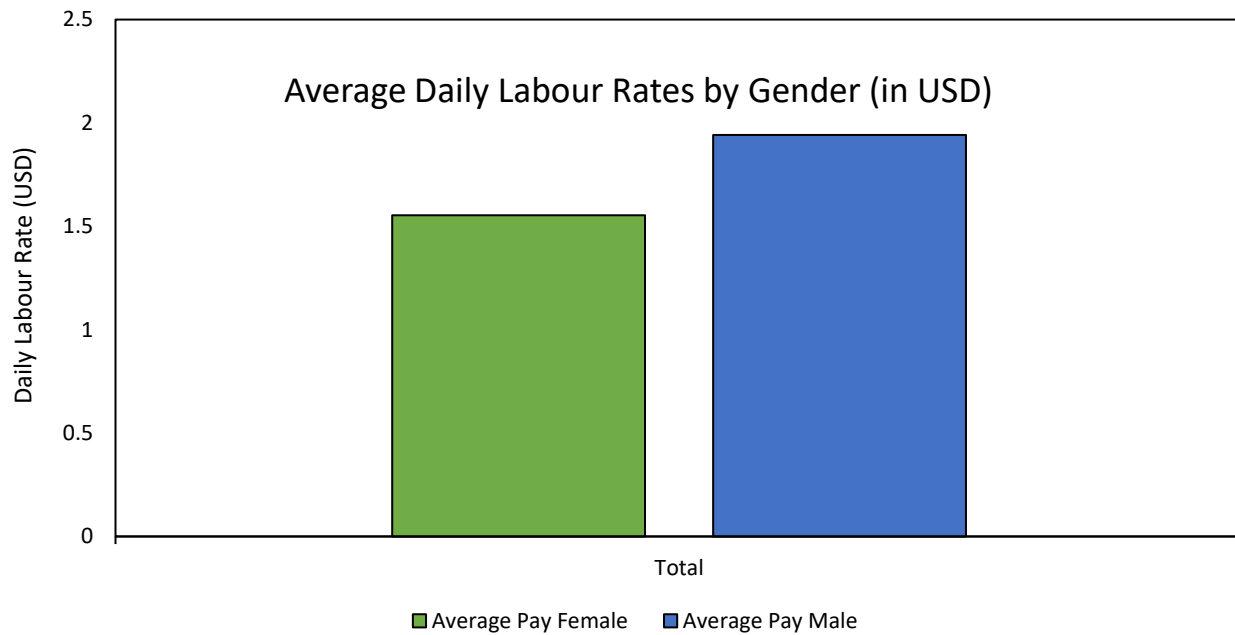


Figure 20. Average daily labor pay rates for men and women as reported by Men in Riokindo area, Kisii sub County

Table 2. Major livestock related problems as viewed and ranked by women and men in Riokindo area, Kisii Sub County

Problem	Suggested solutions	Rank
<i>Women</i>		
In availability and poor transportation of forages	<ul style="list-style-type: none"> <li>Improve road network and establish quality fodder</li> </ul>	5
In availability equipment's for farm operations	<ul style="list-style-type: none"> <li>Acquire affordable farm implements</li> </ul>	4
Diseases	<ul style="list-style-type: none"> <li>Support of farmers by government to access veterinary services</li> </ul>	1
Lack of ready milk market and low prices	<ul style="list-style-type: none"> <li>Milk to fetch better prices in the market</li> </ul>	2
Limitation of capital and high cost of inputs	<ul style="list-style-type: none"> <li>Subsidize cost farm inputs</li> </ul>	3
<i>Men</i>		
Poor quality feeds	<ul style="list-style-type: none"> <li>Trainings and need different types of feeds and forages</li> </ul>	1
Poor livestock breeds	<ul style="list-style-type: none"> <li>Training AI and Breeding; Supply recommended bull</li> </ul>	2
Disease	<ul style="list-style-type: none"> <li>Qualified vets; Cooperatives to have agrovets</li> </ul>	4
Poor management	<ul style="list-style-type: none"> <li>Get trainings; do better housing</li> </ul>	3
Capital	<ul style="list-style-type: none"> <li>Grants; borrow SACCCO and Micro finance</li> </ul>	5

### Intervention rakings from the tool

*The five top-most for women and men include:*

<i>Women</i>	<i>Men</i>
<ul style="list-style-type: none"> <li>❖ Supplementation with energy rich supplements e.g. molasses</li> <li>❖ Supplementation using protein by-products e.g. fish, legume leaf meal</li> <li>❖ Cereal byproducts e.g. rice bran</li> <li>❖ Used of balanced compounded feeds e.g. dairy meal</li> <li>❖ Use of distillers and brewers' waste</li> </ul>	<ul style="list-style-type: none"> <li>❖ Grasses for cut and carry- there are options that can fit under this recommendation: including Panicums cultivars, Cenchrus purpureum, Urochloa- cultivars and hybrid</li> <li>❖ Supplementation with energy-rich supplements e.g. Molasses</li> <li>❖ Irrigated fodder production e.g. grasses, maize and sorghum</li> <li>❖ Short duration- annual fodder crops e.g. oats, maize, sorghum, vetch</li> <li>❖ Protein supplementation e.g. from legume leaf meals, fish meal, oil seed, poultry litter</li> </ul>

### Conclusions

Generally, there is limited forage cultivation in Kisii due to small landholdings, as most of the household incomes come from cropping as opposed to livestock. However, livestock does contribute a significant portion of the incomes and the need therefore, to bolster forages production including other challenges as enumerated by the farmers i.e. diseases and improving livestock breeds. While women and men are at convergence on some agricultural aspect in the area, e.g. price and milk production trends over the year and Napier grass as most popular fodder, some gender differences did appear. Men did not identify sweet potato growing in the area while women did. Similarly, women take maize as the crop taking most of the cropping

land as opposed to bananas for men. Women perceive milk production ranging 6.5–10 liters unlike for men a lower range of 3.3–6.7 liters. This might have influenced men to identifying poor cattle breed ranking highly unlike for women who did not identify poor breeds as a challenge. These differences point to involvement by either gender on the various aspects. These understandings would be helpful in efforts to improve livestock performance in the area, and probably other similar areas.

**Reference**

Lukuyu, B., Eerdewijk, A. Van, Kinati, W., Sultana, N., Mulema, A. and Duncan, A. 2019. Gendered Feed Assessment Tool (G-FEAST) focus group discussion guide. Nairobi, Kenya: ILRI.