

Characterisation of the livestock production system and potential for enhancing productivity in Kiboga district, Uganda

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I Introduction

The Gendered Feed Assessment Tool (G-FEAST) was implemented to characterize the livestock production systems in Kiboga district, Uganda. The G-FEAST tool combines both qualitative and quantitative research approaches to identify if farmers/communities perceive feed as a problem and what are the potential solutions (Lukuyu et al. 2019). The G-FEAST exercise elicits the viewpoints and perspectives of both women and men farmers in the community regarding feeding practices and general crop and livestock production. It considers the constraints that households face, such as the labour burden on women and their limited access to and control over resources.

Kiboga district is located in the central region of Uganda, approximately 124 Km from Kampala city (Uganda Bureau of Statistics 2017). Kiboga district is part of the greater cattle corridor, which includes Kapeke and Dwaniro subcounties. The district is classified as traditional, extensive cattle production characterized by large farms, poorly developed grazing systems, unimproved grasses, and large herds of cattle with Ankole as the dominant breed. Over time, cattle production has gradually transitioned from predominantly beef production to dairy production. There are a few dairy cooperatives developed through the Government of Uganda and development partners. The G-FEAST exercise was conducted on 12 February 2020 in the Dwaniro subcounty. This report presents the findings of the assessment and conclusions for further action.

2 Process and sample description

A scoping exercise was conducted with the help of the local livestock officer to identify individuals and groups of livestock farmers in the project sites. Two gendered focus group discussions (FGDs) were carried out separately, one with 24 men only participating and another with 25 women only participating. Each of the G-FEAST exercises lasted for 2.5–3 hours each and was held in community settings selected for the convenience of the respondents. Thereafter, nine respondents were selected for individual interviews from each of the groups. The selection of the participants for individual interviews was based on different wealth categories using landholding as a proxy. This was considered for both male-headed and female-headed households. The composition of the sample is shown in Table 1. Each group had a facilitator. A female and male facilitator led the women and men G-FEAST sessions respectively, while the joint gender group was facilitated by a woman and man jointly. Before each session, a consent note seeking permission for the interviews from farmers was read to them in the local language. Farmers agreed to the discussions and signed the consent forms before the sessions commenced. Each session had a scribe to keep a record of the proceedings and a timekeeper to manage time. Subsequently, the notes were transcribed into English in Microsoft Word.

Table 1: Male and female respondents for individual interviews by farm size

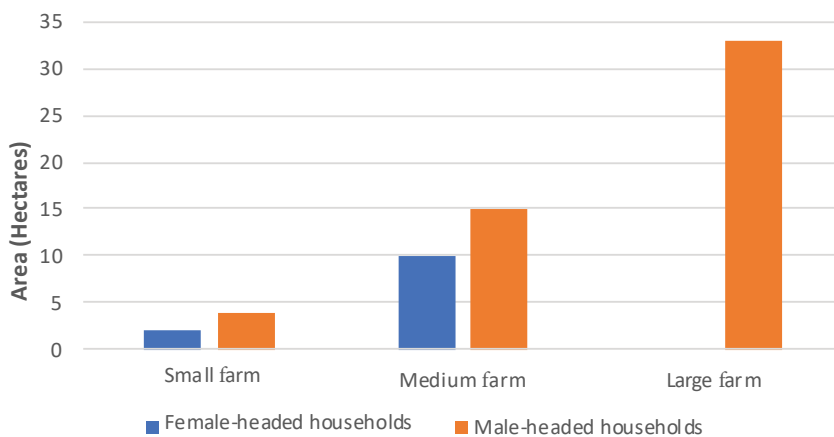
Individual interviews	Male respondents	Female respondents
Small farm size (0–1 ha)	3	3
Medium farm size (1–7.5ha)	3	3
Large farm size (7.5 ha and above)	3	3
Totals	9	9

3 Results

3.1 Farming systems

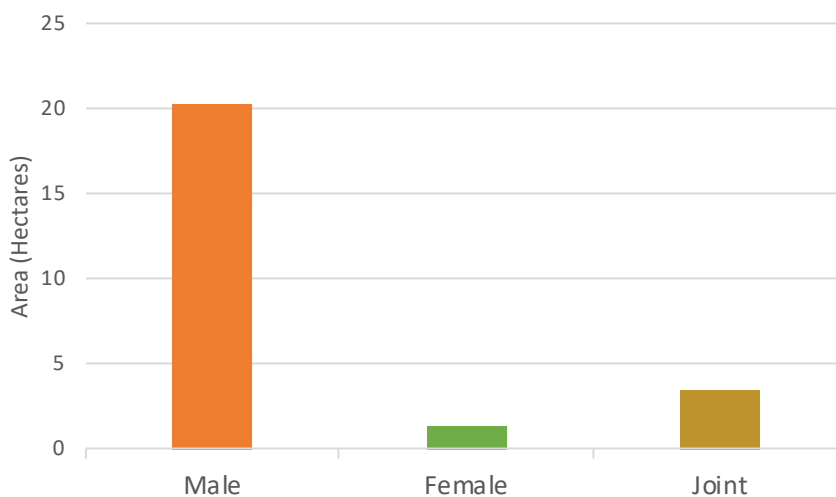
The farming system practiced in the area is primarily a traditional, extensive mixed crop and livestock system. Average farm sizes in Kiboga district are about 15 ha (37 acres), with most of the land being used for grazing activities and smaller proportions dedicated to crop production (both food and fodder crops). The average household size comprises eight people. Figure 1 depicts farm sizes by gender of the household head. It can be observed that across the three landholding categories, men and women own land. The largest proportion of female-headed households falls in the medium-scale farms category whereby female-headed households have on average 10 ha of land. This implies that women in Kiboga district have similar land rights as men. In both G-FEAST discussion groups (men and women), there was consensus that women can own land just as men do.

Figure 1: Farm size by household type



The common land tenure systems of the study sites include leasehold and freehold systems whereby farmers have bought land from the government (both local and national) and communal land (Mailo land) where land is owned by the community. Figure 2 illustrates land ownership by gender within a household. The results indicate that men own most of the land, while in some households, the land is jointly owned by the men and their spouses. In a few households, women own land that is less than 2 ha.

Figure 2: Land ownership by gender



Households in the area commonly grow a variety of food crops as shown in Figure 3. The most dominant food crops include bananas (*Musa acuminata*), maize (*Zea mays*), common beans (*Phaseolus vulgaris*), Irish potato (*Solanum tuberosum*), and Cassava (*Manihot esculenta*). Other food cash crops grown include coffee (*Coffea arabica*), groundnuts (*Arachis hypogaea*), and Soybean (*Glycine max*). Maize is the most dominant cultivated food crop with an average of 1.6 ha committed to its cultivation. Female-headed households are more likely to cultivate bananas, maize, and common beans and less likely to grow potatoes and cassava.

Figure 3: Dominant crop types cultivated (ha) by gender of household head

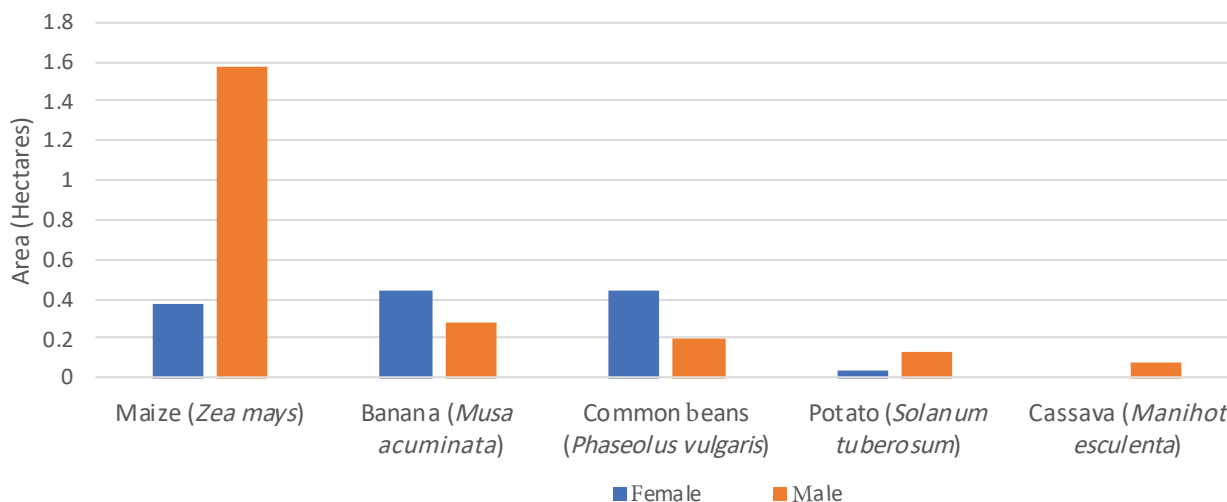
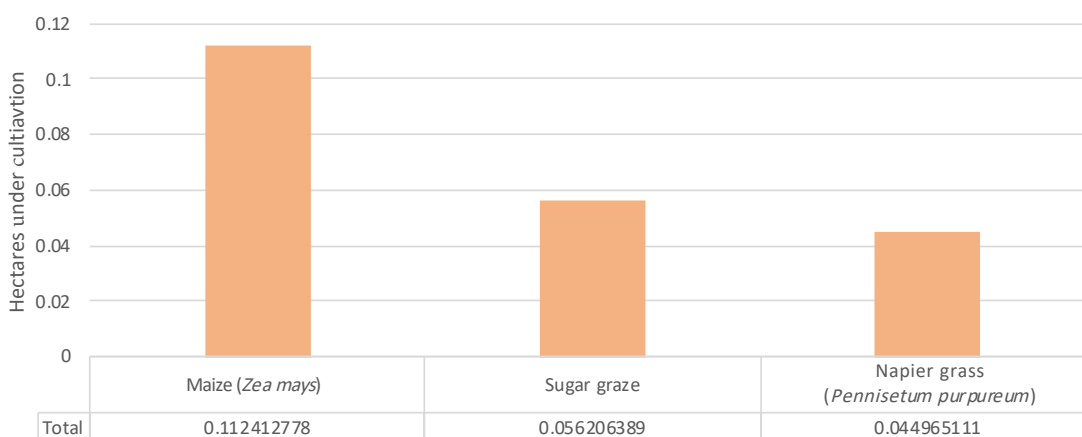


Figure 4 indicates the most dominant fodder crops cultivated by livestock producers in Kiboga district. Maize (*Zea mays*) is mostly grown for silage production on an average land size of 0.11 ha. Sugar graze and Napier grass (*Pennisetum purpureum*) is grown on less than 0.1 ha as cut and carry forages.

Figure 4: Dominant planted forage types (ha)



Rainfall levels are generally adequate to support agricultural activities during the two major cropping seasons in a year. However, farmers reported that over the years unpredictable weather patterns have threatened reliance on rain-fed agriculture. It has also threatened livestock production, which relies heavily on grazing of natural grasses and bushes. Table 2 shows the rainfall pattern by season.

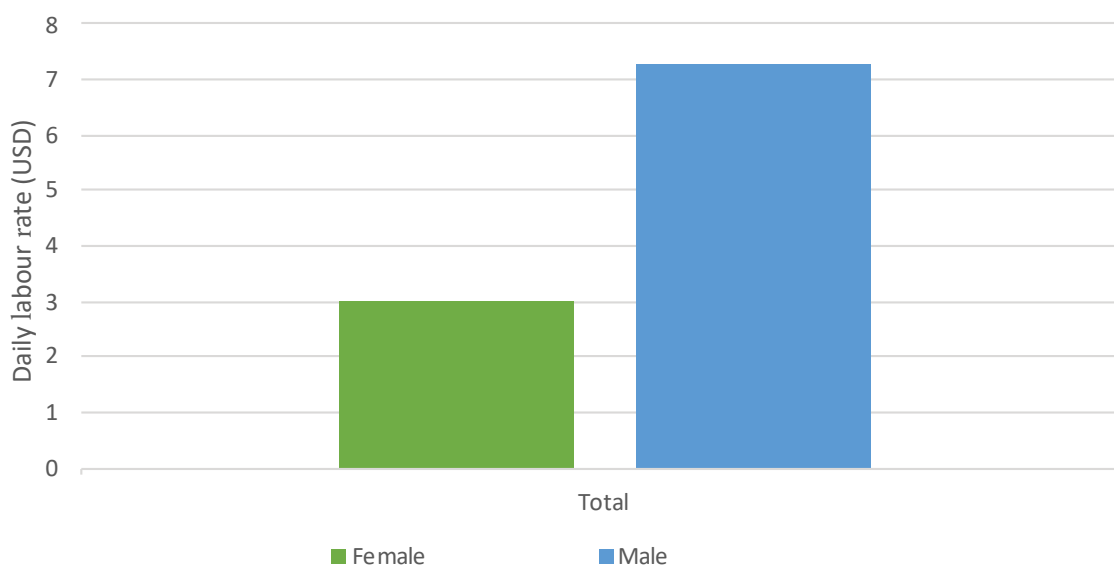
Table 2: Seasonal cropping patterns in Kiboga district

Name of cropping season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dry season (Ekyanda/Kyeya)	■	■					■					
Low rain season (Akanda/Ddumbi)			■	■	■	■						
Heavy rain season (Ttogo)								■	■	■	■	■

The first cropping season of the year for farmers is called Akanda/Ddumbi, which is characterized by short and moderate rain. It starts in March through to May. The most common farming activities during this time include seeding and weeding. The second cropping season is Ttogo and is characterized by long and heavy rainfall. Ttogo starts in late August to the end of November. Major crop farming activities include seeding and weeding. The dry season is referred to as Ekyanda or Kyeya. Rainfall availability is very low (below 1). It occurs in the months of January and February and also in the months of June and July. During Ekyanda, some farmers prepare their land for cultivation while others harvest crops.

Labour is not always available as and when required by farmers. The minimum daily labour cost is UGX5,000 and the maximum rate is UGX10,000. The labour costs vary with the type of farming activity and labour becomes scarce during the planting season. The scarcity of labour is because of the migration of rural urban youth looking for paid jobs. The percentage migration of the youth from Kiboga is over 60%, with the majority being males. Additionally, there is a difference in the wage rate paid to a man compared to a woman. Figure 5 shows that, on average, a man would earn about USD7.2 compared to a woman who earns USD3. This could imply that men are paid more because they are perceived to work longer hours (deliver more work) compared to women, or they do a better job in some activities compared to women.

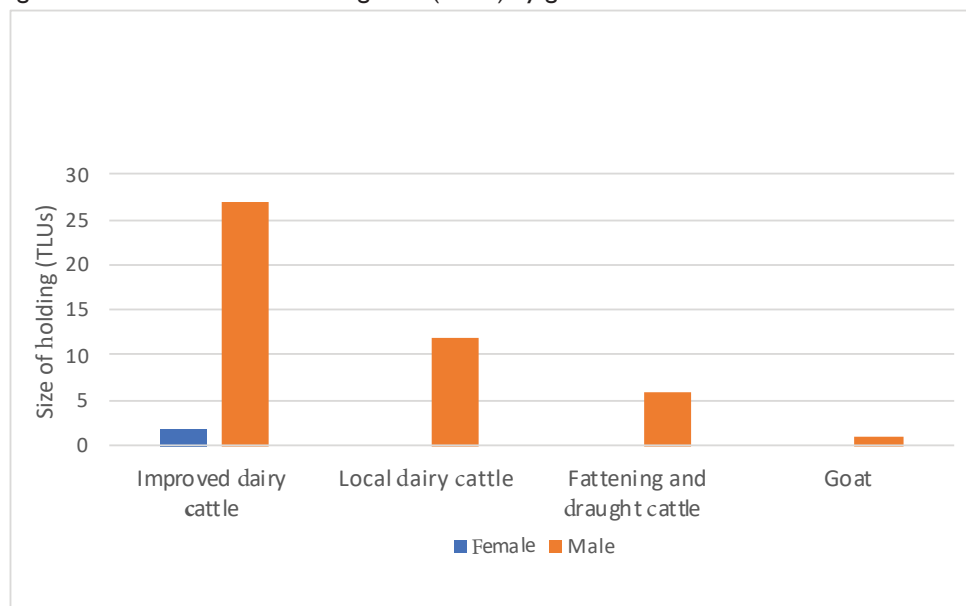
Figure 5: Average daily labour rates by gender (in USD)



3.2 Livestock production system

Improved dairy cattle are the primary type of livestock kept by livestock farmers in Kiboga district (Figure 6). The most dominant breed is Friesian and its crosses. Farmers also rear local (Ankole) dairy cattle for milk production and they are also fattened and used as draught animals. Most cattle are kept for milk and ghee production, while some are fattened for sale as beef (FGD data). Other livestock types include goats, which are mainly kept as a source of income through the sale of live animals for chevon (goat meat).

Figure 6: Dominant livestock categories (TLUs) by gender of the household head.



In Kiboga district, male-headed households dominate in large ruminant production; cattle are mainly for beef, compared to female-headed households who mainly keep improved dairy cattle for milk production. Poultry and small ruminants are mainly kept by women. Livestock, especially cattle, are mainly grazed in open pasture fields most of the day. However, farmers confine and feed their animals with supplements and cut and carry fodder such as Napier grass in feed troughs in the late afternoon. The most common livestock diseases include foot and mouth disease (FMD), tick-borne diseases, lumpy skin, and anaplasmosis. Farmers rely mainly on public and private veterinary officers in the area. Public veterinary officers are much cheaper than private veterinarians; however, they are not readily available. Farmers sometimes supplement veterinary services with traditional veterinary “doctor” services. This is common in treating abortion and mastitis. Both men and women reported that artificial insemination (AI) services are readily available with a score of 5/5. However, the majority of farmers (over 80%) often rely on bull services. Farmers mainly use improved breeds of bulls such as Friesians and Jerseys. Some of the challenges with bull services are increased by the incidence of Brucellosis disease and inbreeding. Farmers reported that AI inseminations sometimes do not work but there are rare cases of repeat services (FGD data).

Both men and women farmers observed that there was a gendered pattern in terms of access to input and services. The services include extension, vaccinations, and AI. Men and women equally listed similar input suppliers, implying both men and women are knowledgeable about the needs of livestock production. The trend can be reflected in the decision-making process in either household whereby men and women make most decisions jointly or individually (Figure 7). This implies that in Kiboga district, women may not own livestock but are actively involved in livestock management decisions.

The main sources of financial service (credit) include banks, village saving and loan associations (VSLAs), Savings and Credit Cooperative Society (SACCO), dairy cooperatives, and local moneylenders (“Shylocks”). In most cases, credit is obtained for the purchase of land, medicines, farm inputs, and other household needs. Informal credit sources dominate in the credit share (70%) compared to formal credit sources (30%). The conditions of accessing credit vary according to the source. Some of the common conditions for obtaining credit for agricultural production include guarantors, national identification, and membership in the case of a SACCO or group. About 80% of the farmers are estimated to have access to credit. On a scale of 0–4, men estimate the ease of accessing credit at three and women also estimate it at three. The reason is that most women belong to informal groups through which they access loans. All of the women and men participants aspired to access credit. Men opined that women and the youth were more constrained in accessing credit due to a lack of collateral. However, women concluded that as long as an individual has security, both men and women can access credit. Therefore, there seemed to be equality in accessing credit regardless of gender but the sources differed.

Figure 7: Gendered decision-making on livestock.

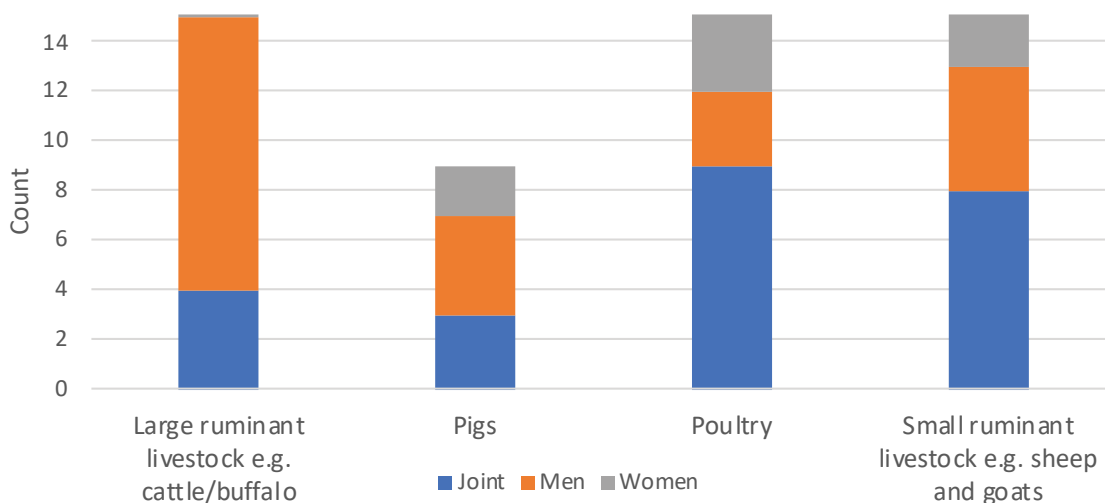


Figure 8 shows the membership of cooperatives or farmer groups by gender. Both women and men are members of cooperatives and farmer organizations. Female household members are more likely to belong to cooperatives or farmer organizations than male members are. In a random household sample, at least two female members belonged to farmer organizations compared to men (one).

Figure 8: Average number of household members of cooperatives and farmer organizations by gender



3.3 Major income sources

Figure 9 presents the major sources of household income within Kiboga district. Results indicate that livestock-related activities, predominantly dairying, contribute the highest share (60%) to household income. Dairying contributes the highest share within the livestock category (60%). Income received from the regular sale of livestock is common in the area as indicated by the proportional off-take rate of 15% for sheep and goats. Cropping (food crops) contributes about 37% to household income. This includes mainly the sale of bananas, maize, and groundnuts. Off-farm business contributes about 3%.

Figure 9: Primary sources of household income by category

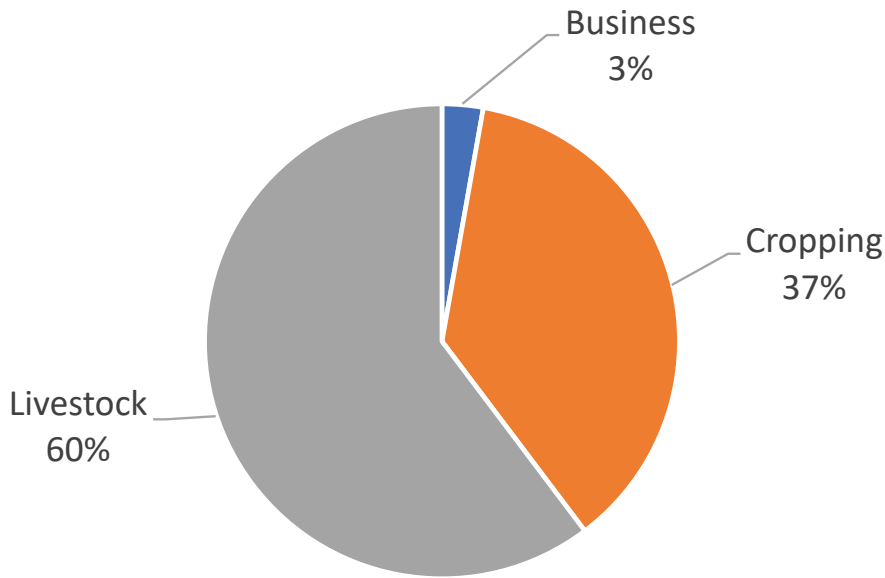


Figure 10 shows the relative contribution of major sources of income to household and women's income. Dairying, fattening animals, food crops, and cash crops contribute the highest share to household income. Remittances and dairying contribute the highest share to the women's income. Remittance sources include spouses, relatives, and friends. Women also derive income from the fattening of sheep and goats.

Figure 10: Relative contribution of income sources to household and women's income

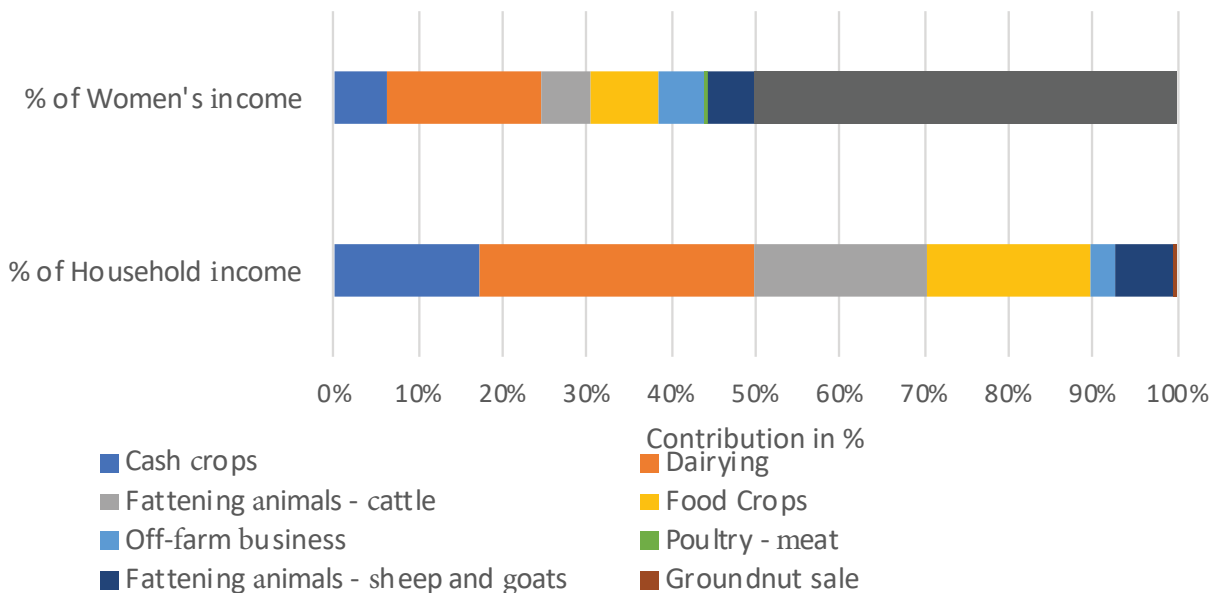
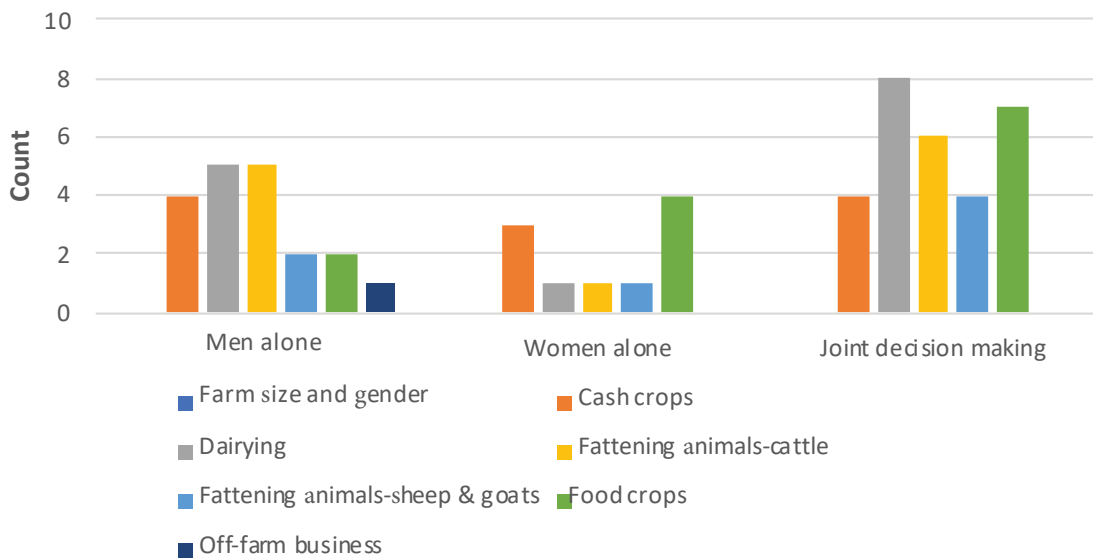


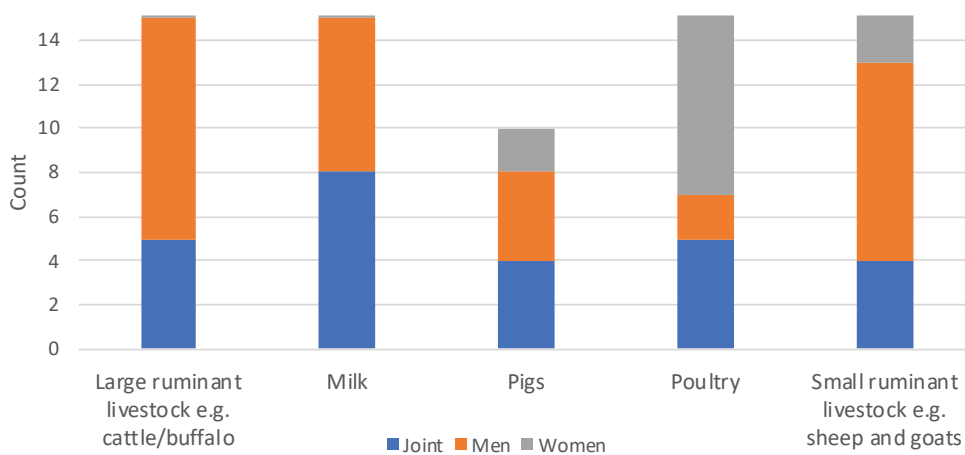
Figure 11 indicates that men make decisions on income from dairying, fattening animals, cash crops, and food crops. In some households, the decisions for the enterprises are made jointly between the man and spouse. In other households, women make most decisions on cash crops, food crops, and in a few households, on dairying.

Figure 11: Gendered decision-making on major sources of household income



If we focus on income from the sale of livestock, it can be observed that women make most decisions alone on poultry, small ruminants, and piggery sales. Men make most decisions on large ruminants, milk sales, small ruminants, and pigs. There is, however, joint decision-making in the sale of livestock and milk (Figure 12). This implies there is a lot of inclusivity on income from livestock.

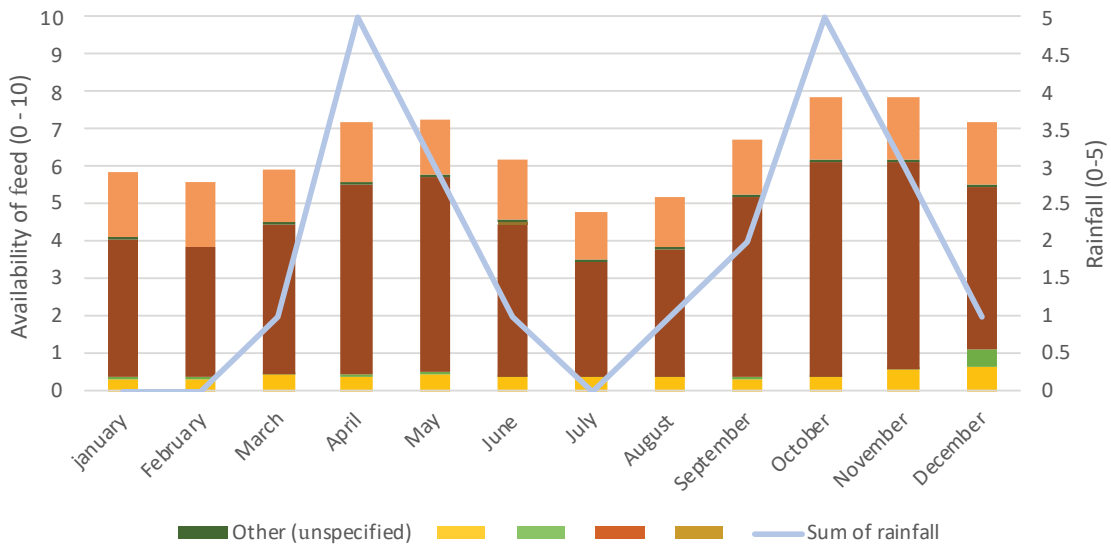
Figure 12: Gendered decision-making on the sale of livestock and milk



3.4 Major feed sources

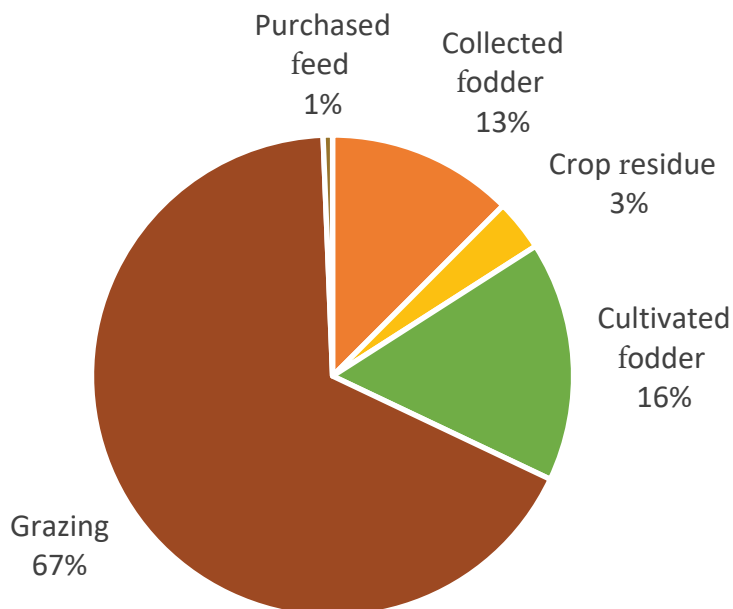
Livestock diets are primarily grazing, crop residues, green forages, legumes, and concentrates as shown (Figure 13). The contribution made by these feed sources to the diet varies throughout the year. Grazing makes up the most significant portion of animal diet. Farmers utilize their expansive land to graze their animals on naturally occurring grasses. Grazing intensity increases during the wet season (March–June) and (September–December). During the dry season, cereal crop residues and legumes are found in larger quantities in the diet. Green forages and collected feeds are incorporated more during the wet season. Concentrates are used in very little quantities; they appear higher in the month of December compared to the rest of the year.

Figure 13: Seasonal availability of feeds in relation to rainfall patterns in Kiboga district throughout the year



Grazing contributes 67% to the total dry matter intake on farms, followed by cultivated fodder (16%) comprising maize, Napier grass and sugar graze. Collected feeds contribute 13% of the dry dietary matter. Crop residues contribute about 3% and consist of residues from cereal crops. Purchased feeds contribute 1% and include maize bran (Figure 14).

Figure 14: Contribution of dietary dry matter (DM) to the total livestock diets by feed source on farms in Kiboga district



The contributions of total ME (MJ/Kg) and crude protein (CP %) are shown in Figures 15 and 16, respectively. As observed, grazing contributes the highest share in terms of ME (MJ/Kg) at 65% and crude protein at 64%. Cultivated fodder contributes 17% to the total ME (MJ/Kg) and a high crude protein at 20%.

Figure 15: Contribution of dietary metabolizable energy (ME, MJ/Kg) to total livestock diet by source on farms in Kiboga district

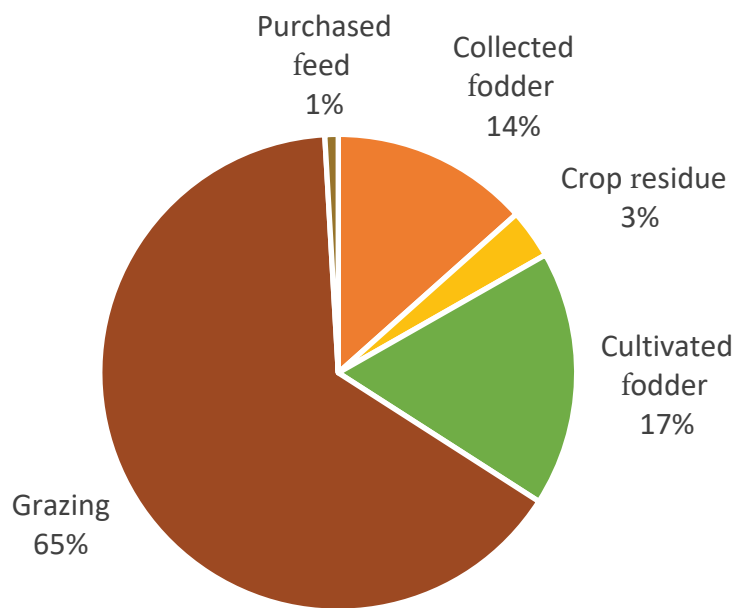
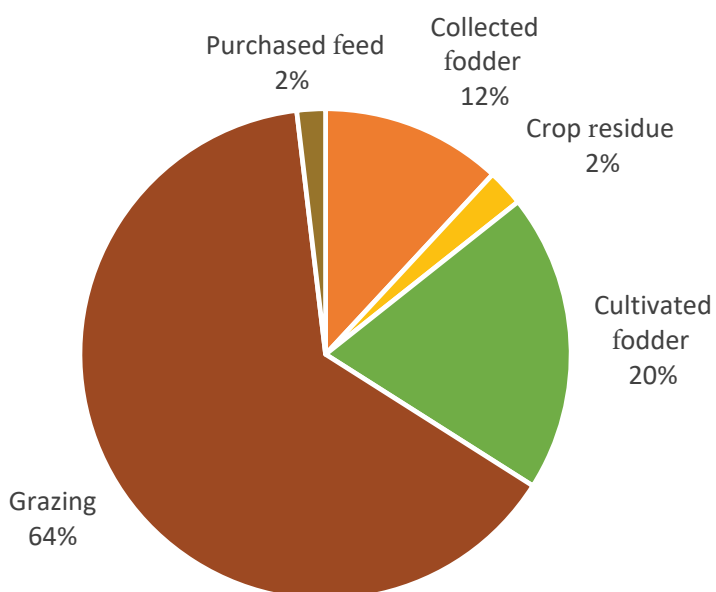


Figure 16: Contribution of crude protein (CP %) to the total livestock diet by source on farms in Kiboga district



Collected fodder contributes 14% to the total ME (MJ/Kg) and 12% to crude protein. Crop residue contributes 3% and 2% to the total ME (MJ/KG) and crude protein respectively. Purchased feed also contributes 1% to the total ME (MJ/Kg) with a crude protein contribution of 2% (see Figures 15 and 16 above).

3.5 Gender division of labour and gendered decision-making on livestock, feed-related activities

Figure 17 shows the different roles of children and the youth, women, and men in forage production activities. Men dominate in land preparation, planting, processing of feed, purchase of feed, and mixing feed ingredients. Women are mostly involved in weeding forage crops and storage of feeds. They are also involved in the collection of off-farm forages, feed harvesting, and mixing feed ingredients. Children and the youth are mainly involved in cleaning livestock feeding and watering facilities, collecting off-farm forages, feeding, harvesting, and watering. In general, it is observed that all household members provide considerable labour in the production and management of forages and livestock.

Figure 17: Gender division of labour in feed production, harvesting, and feeding practices on farms in Kiboga district

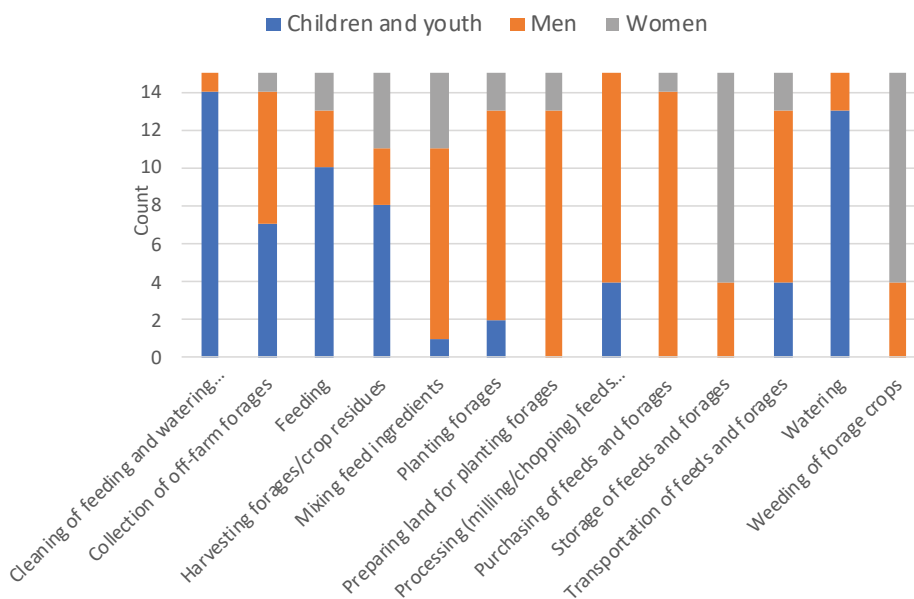
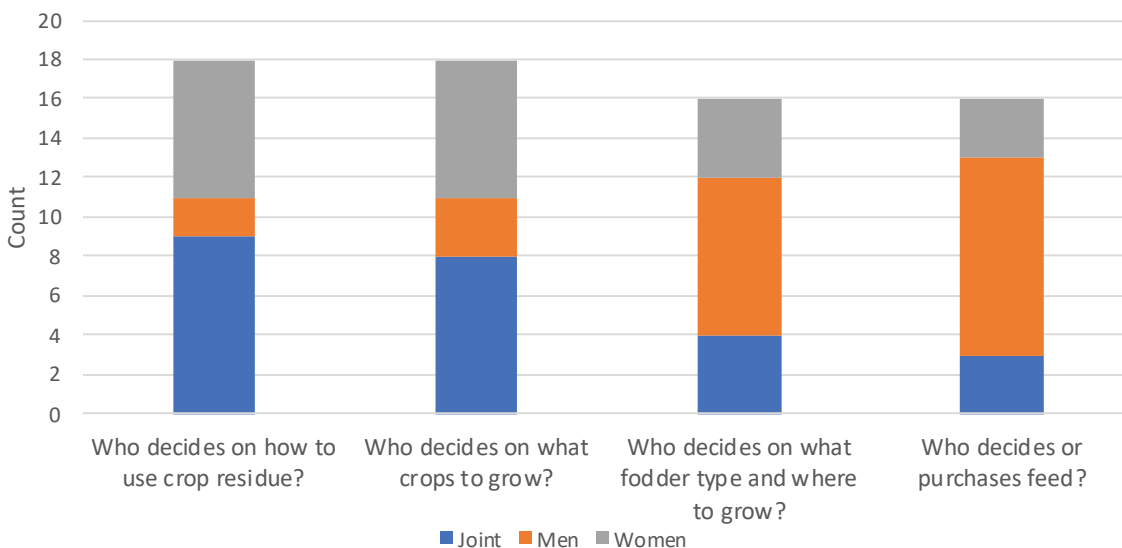


Figure 18 shows the decision-making roles of men and women regarding crops and feeding. It is evident that in a household, both men and women make joint decisions about what to grow, where, and how. Regarding decisions relating to feeds (type of fodder, where to grow, what to purchase), men are the sole decision-makers. However, women are involved either as sole decision-makers or in joint decision-making.

Figure 18: Gendered decision-making on cropping and feeding activities



3.6 Problems and opportunities

Table 3 summarizes the problems and challenges farmers face and possible solutions, as suggested by the farmers.

- The main challenges identified by men in the community are tick-borne diseases, vaccinations, limited water availability, low milk prices, and limited arable land for forage production.
- The main problems identified by women in the community are ticks, diseases, limited access to water, high cost of labour, and scarcity of fodder.

Table 3: Problems, issues, and proposed farmer solutions within production systems in Kiboga district

Main problem	Who is affected most? (Small/medium/large farms; men/women; MHH/FHH; etc.)	Proposed farmer solutions	Ranking by men	Ranking by women
Diseases	All	<ul style="list-style-type: none"> • Vaccination 	1	3
Ticks	All	<ul style="list-style-type: none"> • Regular spraying of animals 	2	2
Water scarcity	All	<ul style="list-style-type: none"> • Buying water from vendors • Investment in water harvesting and storage 	4	1
Low milk prices	All	<ul style="list-style-type: none"> • Value addition of milk e.g., production of ghee • Formation of cooperatives/ recruiting farmers to existing cooperatives 	3	5
Scarcity of feed/limited land for forage production	All	<ul style="list-style-type: none"> • Planting improved pastures • Reducing on herd sizes to prevent overstocking • Purchasing feeds during dry season • Pasture/fodder conservation 	5	4

4 Potential interventions

The proposed interventions include:

- Train farmers on proper feed management practices such as feed conservation and processing, e.g., haymaking and silage.
- Introduce new fodder varieties with higher nutritive quality adapted to the agro-ecological production system.
- Train farmers on proper fodder husbandry/production techniques on-farm through demonstration plots.
- Introduction of alternative pest and disease management mechanisms to reduce disease prevalence.
- Train farmers on animal nutrition for increased production of high-quality milk (emphasis on concentrates and other minerals).
- Build capacity of farmers through the local dairy cooperatives on value addition of milk to improve market access and increase price stability.
- Train farmers on the importance of water harvesting and proper storage and use.

5 Conclusion

Farmers in Kiboga district are inclined towards dairy production and fattening of cattle in traditional extensive systems. The introduction of improved forage varieties in existing pastures should be encouraged. Farmers should be exposed to improved forage varieties and offered training in forage production and management as well as pasture improvement. Promotion of AI services and introduction of improved cattle breeds would improve productivity in the area. Farmers should also receive training on animal nutrition, improved use of forage, and balanced feed ration formulation for increased livestock production. The youth and women in feed production and livestock, in general, should be encouraged by making the value chain attractive in terms of the activities that create jobs for them.

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