

# An assessment of livestock production systems and local feed resources used to inform feed utilization and livestock production in the Mbarara District of Uganda

Ben Lukuyu<sup>1</sup>, Kevin Maina<sup>1</sup>, Patricia Namutebi<sup>1</sup>, Molly Allen<sup>2</sup>, William Nanyenya<sup>2</sup>, Walugembe Faitwa<sup>2</sup> and Owomujuni Chrisonus<sup>3</sup>

1 International Livestock Research Institute (ILRI), Kampala, Uganda

2 National Livestock Resources Research Institute (NaLiRRI), Nakyesasa, Uganda

3 The Mbarara District Veterinary Office, Mbarara, Uganda



CGIAR is a global partnership that unites organizations engaged in research for a food-secure future. The CGIAR Research Program on Livestock provides research-based solutions to help smallholder farmers, pastoralists and agro-pastoralists transition to sustainable, resilient livelihoods and to productive enterprises that will help feed future generations. It aims to increase the productivity and profitability of livestock agri-food systems in sustainable ways, making meat, milk and eggs more available and affordable across the developing world. The Program brings together five core partners: the International Livestock Research Institute (ILRI) with a mandate on livestock; the International Center for Tropical Agriculture (CIAT), which works on forages; the International Center for Agricultural Research in the Dry Areas (ICARDA), which works on small ruminants and dryland systems; the Swedish University of Agricultural Sciences (SLU) with expertise particularly in animal health and genetics and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) which connects research into development and innovation and scaling processes.


The Program thanks all donors and organizations which globally support its work through their contributions to the [CGIAR Trust Fund](#)

© 2021



This publication is copyrighted by the International Livestock Research Institute (ILRI). It is licensed for use under the Creative Commons Attribution 4.0 International Licence. To view this licence, visit <https://creativecommons.org/licenses/by/4.0>.

Unless otherwise noted, you are free to share (copy and redistribute the material in any medium or format), adapt (remix, transform, and build upon the material) for any purpose, even commercially, under the following conditions:

 **ATTRIBUTION.** The work must be attributed, but not in any way that suggests endorsement by ILRI or the author(s).

#### NOTICE:

For any reuse or distribution, the licence terms of this work must be made clear to others.

Any of the above conditions can be waived if permission is obtained from the copyright holder.

Nothing in this licence impairs or restricts the author's moral rights.

Fair dealing and other rights are in no way affected by the above.

The parts used must not misrepresent the meaning of the publication.

ILRI would appreciate being sent a copy of any materials in which text, photos etc. have been used.

Editing, design and layout—ILRI Editorial and Publishing Services, Addis Ababa, Ethiopia.

Photo credit: ILRI/Ben Lukuyu

Citation: Lukuyu, B., Maina, K., Namutebi, P., Allen, M., Nanyenya, W., Faitwa, W. and Chrisbonus, O. 2021. *An assessment of livestock production systems and local feed resources, used to inform feed utilization and livestock production in the Mbarara District of Uganda*. Nairobi, Kenya: ILRI.

*Patron: Professor Peter C Doherty AC, FAA, FRS*

*Animal scientist, Nobel Prize Laureate for Physiology or Medicine—1996*

Box 30709, Nairobi 00100 Kenya  
Phone +254 20 422 3000  
Fax +254 20 422 3001  
Email [ilri-kenya@cgiar.org](mailto:ilri-kenya@cgiar.org)

[ilri.org](http://ilri.org)  
*better lives through livestock*  
ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia  
Phone +251 11 617 2000  
Fax +251 11 667 6923  
Email [ilri-ethiopia@cgiar.org](mailto:ilri-ethiopia@cgiar.org)

*ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa*

# Contents

Tables	iv
Figures	v
1. Introduction	1
2. Selection of participants and survey structure	2
3. Results	3
3.1 Farming systems	3
3.2 Livestock production system	6
3.3 Major sources of income	8
3.4 Major feed sources	10
3.5 Gender divisions regarding labour and gendered decision making regarding livestock and feed related activities	12
3.6 Challenges and opportunities	13
4. Potential interventions	14
5. Conclusion	15
6. References	16

# I. Introduction

The Gendered Feed Assessment Tool (G-FEAST) was used to assess the feed related aspects of the livestock production systems in the Mbarara District of Uganda. The Mbarara District is located in the Southwest region of Uganda. It is about 269 kilometres from Kampala city (Uganda Bureau of Statistics 2017). The Mbarara District is classified as an improved and extensive crop and livestock production system. The area has well established dairy cooperatives and large farms with mixed crop systems. Farmers in the area practice open grazing on natural and improved pastures.

The G-FEAST method was carried out on 21 February 2020 in the Rwebishekye Parish of the Rwanyama Nembe sub-county. G-FEAST is a systematic method that can be used to assess local feed resource availability and utilization. It is helpful in the design of intervention strategies that aim to optimize feed utilization and animal production. The tool combines both qualitative and quantitative research techniques to elicit the viewpoints and perspectives of both female and male farmers in the community, in relation to feeding practices and general livestock production. Focused group discussions (FGDs) provide an overview of the farming system with an emphasis on issues related to livestock feed. Individual interview sessions are designed to provide a representative sample of farmers, under the guidance of the G-FEAST facilitator.

This report presents the findings of the G-FEAST assessment and includes conclusions regarding overall feed availability, as well as about the quality and seasonality of feed availability, which can be used to help inform intervention strategies.

## 2. Selection of participants and survey structure

A scoping exercise was conducted with the help of a local livestock officer, to identify farmers in the area. Two separate gendered FGDs were carried out: one comprising only men (19 men participated); and another comprising only women (12 women participated).

In addition, individual interviews were conducted with 12 respondents. Participants for the individual interviews were selected to ensure broad representation of different wealth groups (in terms of land holding) and so as to include both male-headed and female-headed households. The composition of the sample group that participated in the individual interviews was as follows:

Table 1: Male and female respondents (sorted according to farm size), who participated in individual interviews

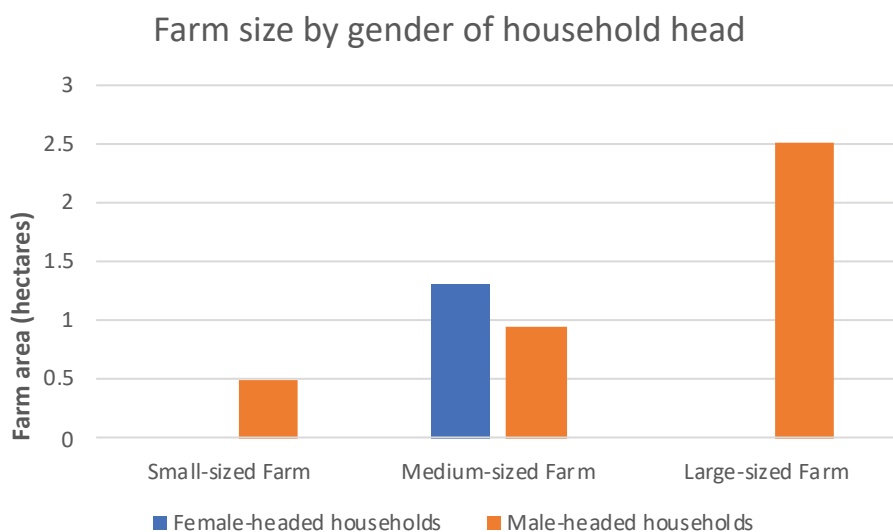
Individual Interviews	Male respondents	Female respondents
Small farm size (0–1 ha)	2	2
Medium farm size (1–7.5 ha)	2	2
Large farm size (7.5 ha and above)	2	2
Totals	6	6

## 3. Results

### 3.1 Farming systems

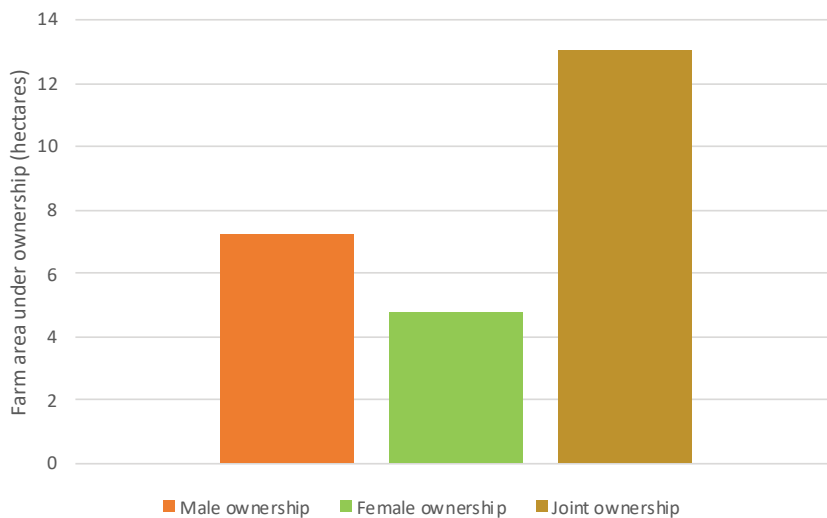
The farming systems in the Mbarara District are primarily improved and extensive mixed crop and livestock systems. Average farm sizes in the district are about four hectares (ha), with most of the land being used for crop production and livestock grazing. The average household size is eight people. Figure 1 shows farm size according to the gender of the household head. Across the three land holding categories (small, medium and large farms), it is clear from the data that men and women both own land. Female-headed households own the largest proportion of medium sized farms when compared with male-headed farms. This implies that women in the Mbarara District can have equal land rights to that of men. In both the male and female focus groups, there was a consensus that women can own land.

Figure 1: Farm size according to the gender of the household head



Land ownership is mostly on a leasehold basis, whereby farmers buy land from the government (from both the local and national government). Figure 2 shows that male and female headed households are equally capable of owning land - either individually or jointly. Most of the land is jointly owned by both men and women. There is an equitable distribution of ownership of productive assets such as land between men and women, thereby bridging the gender gap.

Figure 2: Land ownership by gender



Households in the area commonly grow a variety of food crops including bananas (*Musa acuminata*), maize (*Zea mays*), common beans (*Phaseolus vulgaris*), broad beans (*Vicia faba*) and potatoes (*Solanum tuberosum*). Other crops that are grown include cassavas (*Manihot esculenta*), groundnuts (*Arachis hypogaea*), passion fruit (*Passiflora edulis*), coffee (*Coffea arabica*) and pearl millet (*Pennisetum glaucum*). Bananas are grown on a large-scale basis and are commercially sold in the urban markets (such as in Kampala). Bananas, which are commonly known as “matooke”, are a common delicacy in most households in Uganda. Figure 3 indicates the dominant crop types according to the gender of the household head. Female-headed households are more likely to cultivate bananas, maize, beans and cassava and are less likely to grow potatoes.

Figure 3: Dominant crop types cultivated, according to the gender of the household head

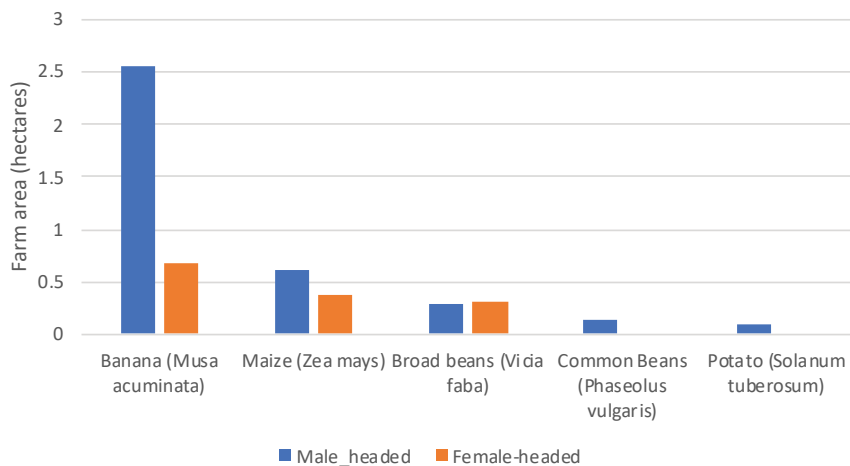
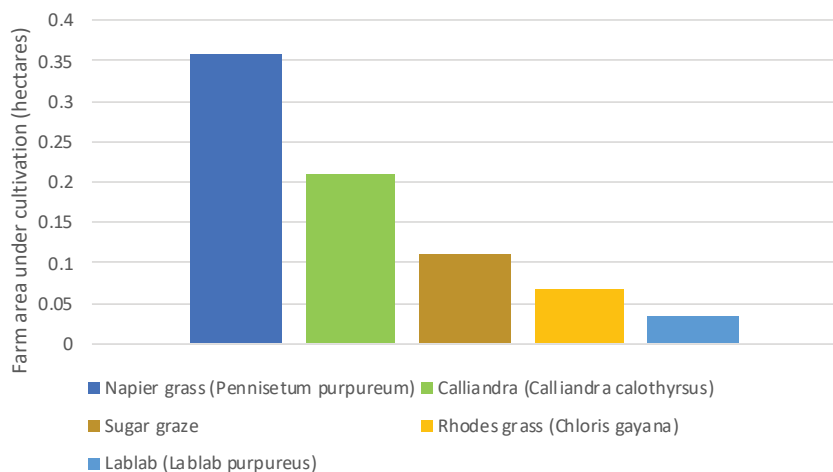


Figure 4 shows that farmers also utilize their land to cultivate forage crops such as Rhodes grass (*Chloris gayana*), Napier grass (*Pennisetum purpureum*), Calliandra (*Calliandra calothyrsus*), sugar graze and lablab (*Lablab purpureus*). Napier grass is grown as a ‘cut and carry’ fodder, on an average land size of 0.35 ha.

Figure 4: Dominant fodder crops by area under cultivation



Rainfall levels are generally adequate to support agricultural activities. However, over time unpredictable rainfall patterns are becoming more common, making the efficacy of rain-fed agricultural activities unreliable.

Table 2: Seasonal cropping patterns in the Mbarara District

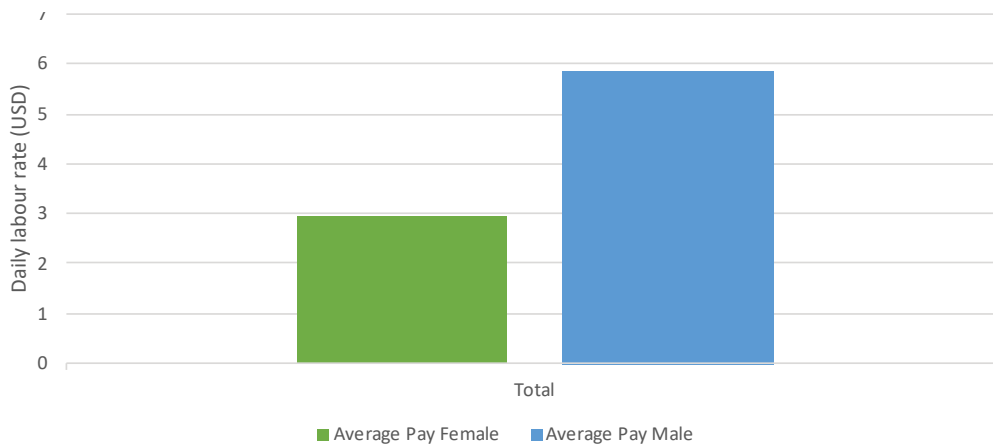
Name of season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dry season (Kyeya/Ekeya)	█	█				█	█					█
Low rain season (Esoka)			█	█	█	█						
Heavy rain season (Eyokubili)								█	█	█	█	

The first season for farmers is called Obutwigo or Akanda, which is characterized by low rainfall. It starts in March and farmers prepare their land during this time for cultivation in the dry season (known as Ekyanda). The second planting season (Itumba or Ajura) starts in September and is characterized by heavy rainfall. It is the season when most farmers plant their main crops.

Labour is not always available as and when required and becomes more scarce during the planting seasons. The scarcity of labour is due to rural-urban migration of youth. In addition, alcoholism prevents many youth from taking part in labour related activities. The migration of youth out of the Mbarara District is over 70%, the majority of which are men. The approximate minimum daily labour rate is 5,000 Ugandan Shillings (UGX) and this goes up to a maximum of UGX10,000. These labour costs vary depending on the work activity. In addition, men and women are paid different wage rates. Figure 5 shows that on average, men earn about USD5.8 compared with women who earn USD3. This could indicate that men are paid more because they work longer hours compared with women - or that they perform better in certain work activities compared with women. It could also indicate a societal gender bias, whereby women are viewed as being inferior.



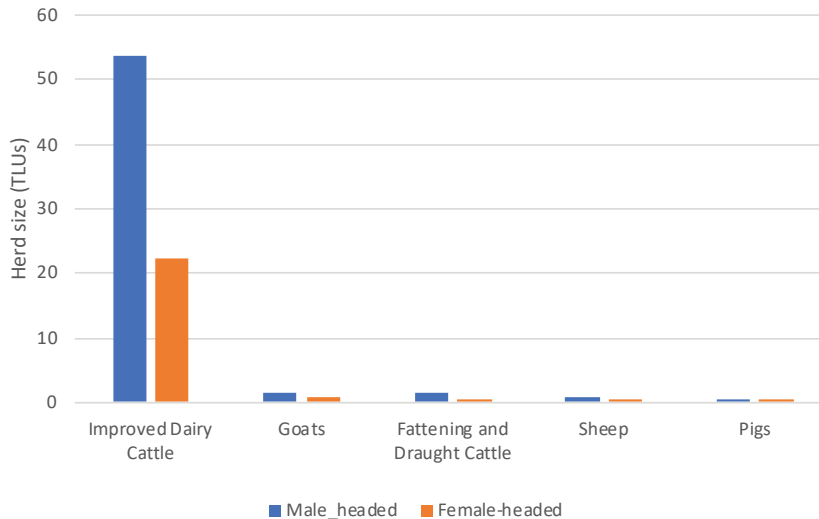
Figure 5: Average daily labour rates by gender (in USD)



## 3.2 Livestock production system

Improved dairy cattle are the most dominant type of livestock kept by farmers in the Mbarara District (Figure 6), with the most dominant breed being Friesian cattle (and its crosses). Other livestock types that are kept by farmers include goats, fattening and draught cattle (Ankole), sheep and pigs. Most cattle are kept for milk production and for sale as fattened cattle (FGD data). Sheep and goat hybrids (shoats) and pigs are mainly kept as a source of income. In both of the focus groups (for men and women respectively), there was no difference in the reasons given for rearing the main livestock species.

Figure 6: Dominant livestock categories farmed (measured in tropical livestock units (TLUs), according to the gender of the household head



Male-headed households dominate significantly in terms of improved dairy cattle production and as opposed to farming smaller ruminants (goats and sheep).

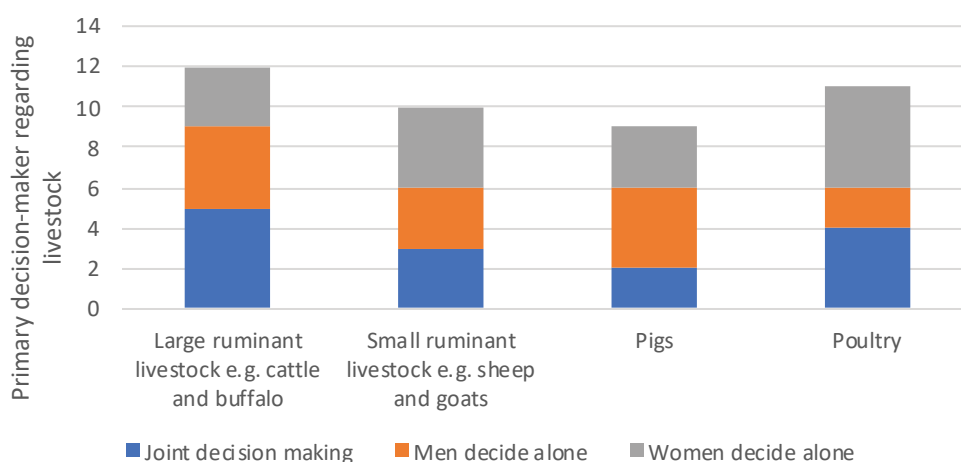
Livestock, especially cattle, are predominantly kept in feeding paddocks, where they are separated by breed, sex and age. Farmers also have feeding troughs to provide their animals with cut and carry fodder such as Napier grass and hay.

Common livestock diseases include mastitis, brucellosis, East Coast fever (ECF), reproductive problems and foot-and-mouth disease (FMD). Farmers rely mainly on public and private veterinary officers in the area to deal with livestock diseases and general health issues. Public veterinary officers are much more affordable than private veterinarians, however, they are not readily available. Farmers complement veterinary services with traditional veterinary “doctors”.

In terms of breeding, artificial insemination (AI) services are readily available. However, the majority of farmers (over 80%) tend to rely rather on bull services for reproduction. Farmers use their bulls, especially the improved breeds such as Friesians and Jerseys. Some of the challenges with bull services include an increased incidence of brucellosis and the use of under-age bulls. Farmers noted that AI services are not always effective and that they frequently would require at least two additional services.

Through the focus group discussions, a gendered pattern in terms of access to inputs and services was observed. Both men and women listed similar input suppliers, which indicates that both gender groups are knowledgeable about the needs of their enterprises. This is also reflected in the decision-making processes in households, whereby men and women make most decisions jointly or individually (Figure 7). This implies that there is equitable inclusion of women in livestock production in the Mbarara District.

Figure 7: Gendered decision-making regarding livestock



The main sources of financial services (in relation to credit) include banks, Village Savings and Loans Associations (VSLAs), Savings and Credit Cooperative Societies (SACCOs), cooperatives and moneylenders (which are known locally as abawola). Formal credit sources are the dominant form of credit, accounting for a 75% share, compared with informal credit sources which account for a 25% share. Some of the conditions for obtaining credit for agricultural production include guarantors, national identification and sometimes a recommendation from the chairperson of a local council. On a scale of 0–4 (with 0 being very difficult and 4 being very easy), the male focus group discussions ranked the ease of accessing credit at 2, while the female focus group discussions ranked it at 4. This implies that women are able to more easily access credit compared with men. This also implies that women have access to a broader range of credit sources than men, mostly in the form of VSLAs. In both focus groups, youth were identified as having more difficulty in accessing credit, which is mostly due to the fact that they do not have any form of collateral.

Figure 8 shows the membership of farming cooperatives or farmer groups, according to gender. Female household members are more likely to belong to farmer organizations or farmer groups in the Mbarara District compared with male household members. The average household has at least two female members belonging to a farmer group, compared with 1.5 male household members on average belonging to farmer groups.

Figure 8: Average number of household members belonging to cooperatives and farmer organizations, according to their gender



### 3.3 Major sources of income

The data displayed in Figure 9 indicates that livestock related activities contribute the highest proportion (around 50%) of average, overall household incomes. Dairying contributes the largest share within the livestock category. It is uncommon for livestock sales to contribute towards household incomes in the area and it only accounts for 1% of average household incomes. Livestock are only sold when and as needed, or during festivities. This is indicated by income variations throughout each year. Cropping (food crops) contribute 36% towards household incomes. This is mainly through the sale of bananas and maize. Off-farm business activities contribute 11% towards average household incomes, followed by employment which contributes 2%, and remittances which contribute 1%.

Figure 9: Primary sources of household income, according to the type of activity

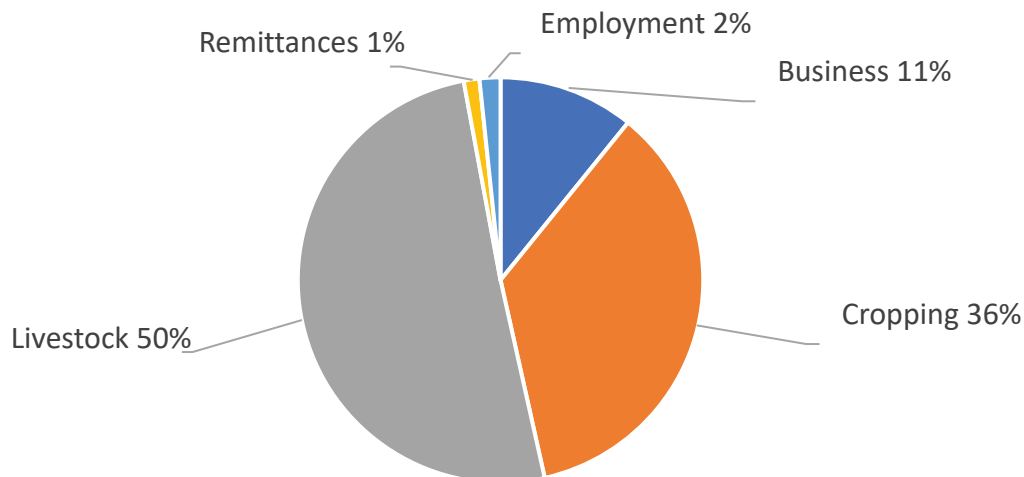


Figure 10 shows the relative contribution of the major sources of income to both overall household incomes and to the average incomes of women. Dairying, food crops and cash crops contribute the highest proportional share towards the overall income of women. Other income sources include off-farm business, poultry (eggs and meat), fattening animals (sheep and goats) and piggery activities.

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

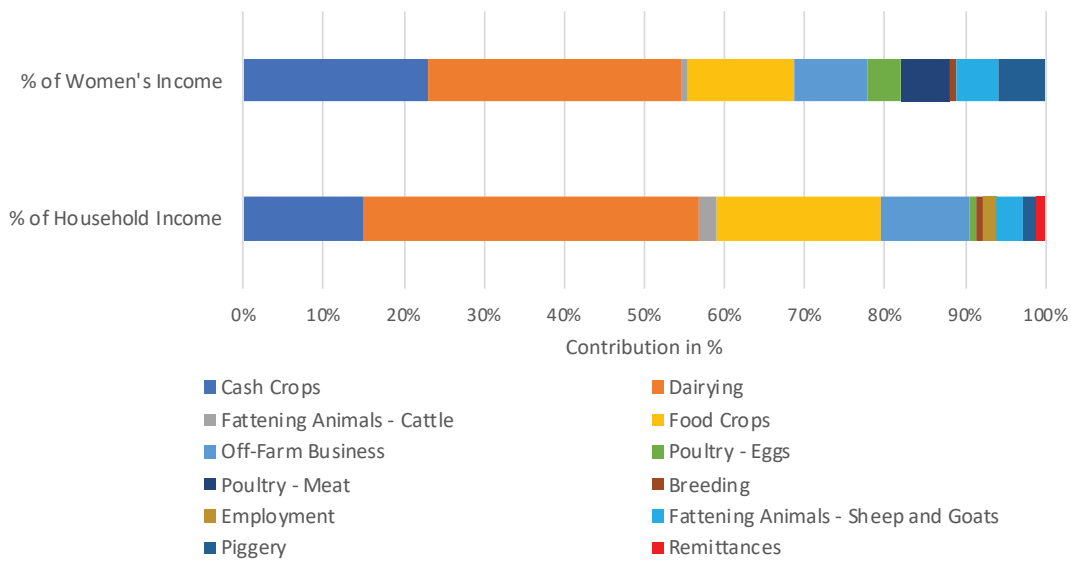
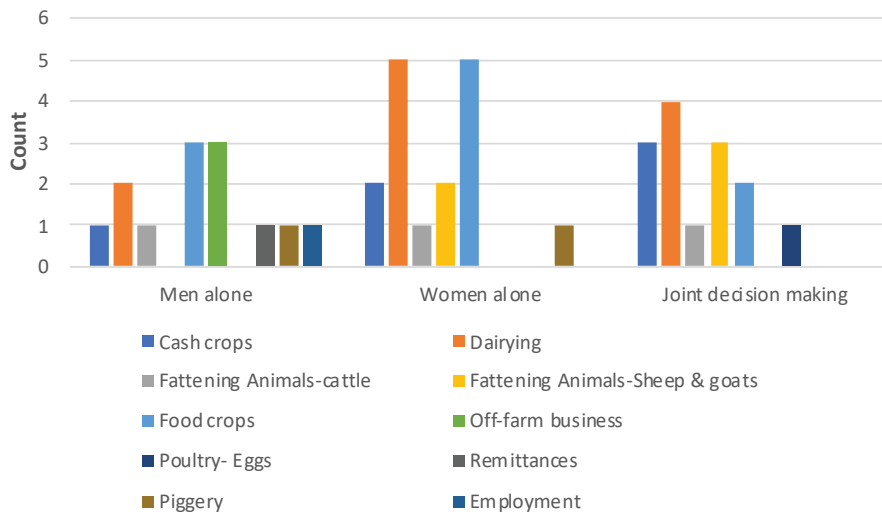


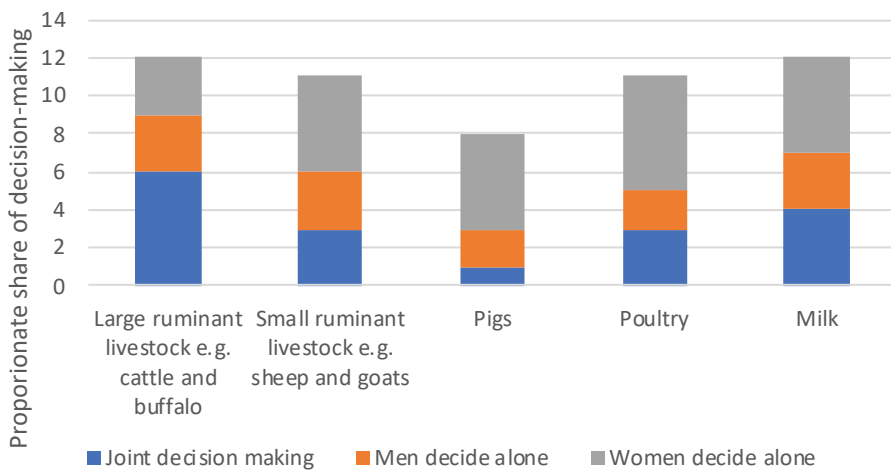
Figure 11 indicates that men make most decisions related to sources of income from dairying, food crops and off-farm business compared with women who make most decisions regarding sources of income related to food crops, dairying and piggery activities. However, in some households, there is joint decision making, especially related to income from cash crops, dairying, fattening animals, poultry and other sources.

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



Regarding income derived from the sale of livestock, women are the primary decision makers on issues related to sources of income from poultry, milk, small ruminants and to some extent, sheep. Men make most decisions about large ruminants - either alone or jointly. A small proportion of women make decisions alone (see Figure 12).

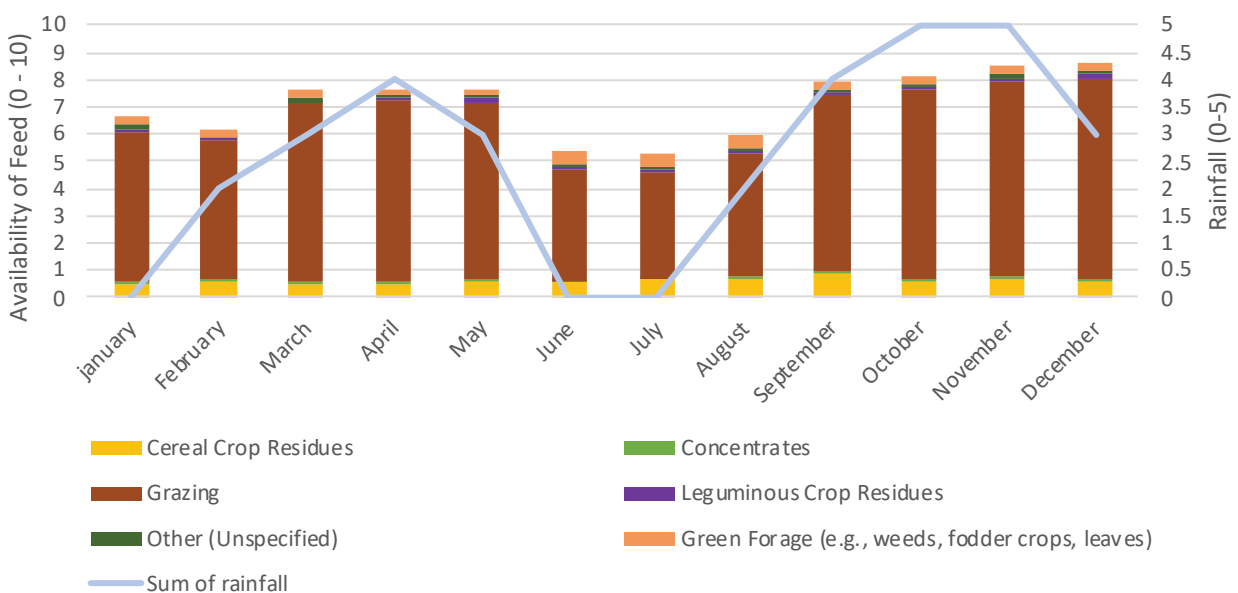
Figure 12: Gendered decision making on the sale of livestock and milk



### 3.4 Major feed sources

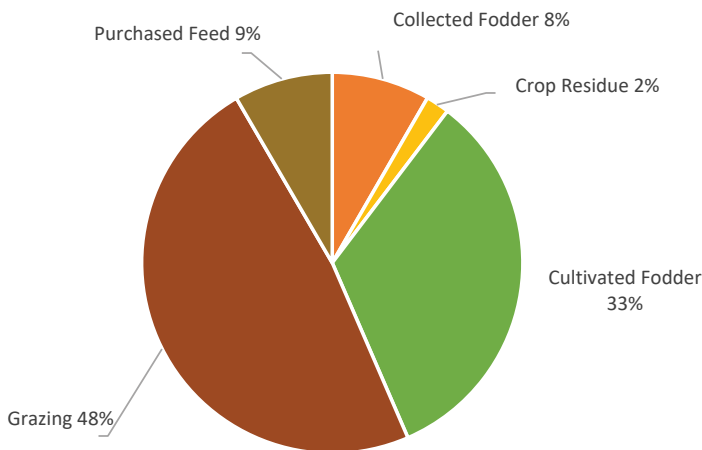
Livestock diets are primarily composed of grazing on natural pasture, crop residues, green forages, legumes, concentrates and agro-processing by products (such as brewers waste) (Figure 13). Grazing contributes the most significant share of all feed sources in animal diets. Farmers utilize a paddocking system, zero grazing and some free-range systems to rear cattle. Grazing intensity increases during the wet season (from March–June and September–December). During the dry season, green forages such as planted forages (Napier grass) and cereal crop residues provide supplemental grazing fodder. However, there is not much use of concentrates such as maize bran, dairy meal or other alternatives throughout the year.

Figure 13: Dietary composition of cattle in the Mbarara District throughout the year, in relation to rainfall pattern and availability of feed



Grazing contributes 48% to the total dry matter intake on farms, followed by cultivated fodder (33%) which comprises Rhodes grass, Napier grass, sugar graze, lablab and Calliandra. Crop residues contribute about 2% of total dry matter intake, which consists of residues from cereal crops, bananas and legumes. Purchased feeds contribute 9% and these include maize bran and concentrates. Collected fodder contributes about 8% to the total dry matter intake (Figure 14).

Figure 14: Contribution of dietary dry matter (DM) to overall livestock diets, according to the feed source



The contributions of total metabolisable energy (ME) intake and crude protein intake are shown in Figures 15 and 16, respectively. As observed, grazing contributes the highest share in terms of ME (MJ/Kg) at 46% and it also represents the second highest share of crude protein intake at 34%. Cultivated fodder contributes 32% to the total ME (MJ/Kg) and it also contributes the highest share of crude protein intake at 41%.

Figure 15: Contribution of dietary metabolizable energy (ME, MJ/Kg) to overall livestock diets on farms in the Mbarara District

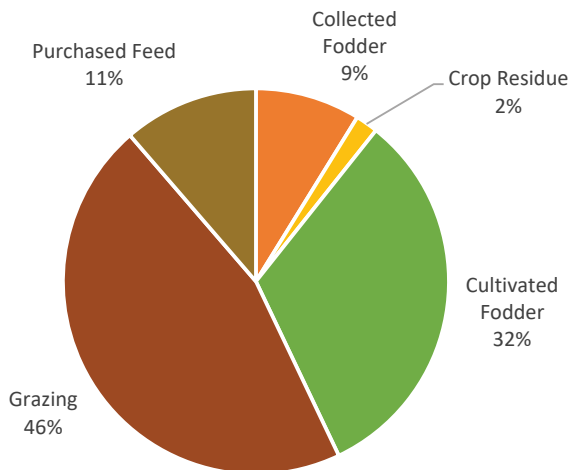
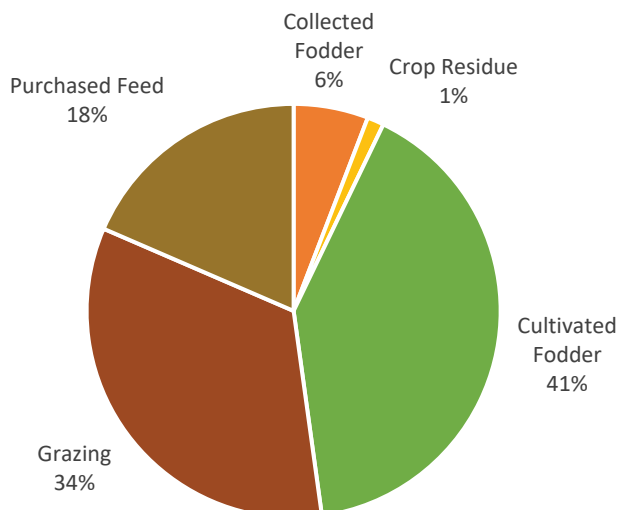


Figure 16: Contribution of crude protein (CP) to the overall livestock diets on farms in the Mbarara District



Purchased feeds also contribute a significant share of the total ME intake (11%) and they also contribute 18% towards the overall crude protein intake in livestock diets. Collected forages contribute about 9% of the total ME intake and 6% of the total crude protein intake.

### 3.5 Gender divisions regarding labour and gendered decision making regarding livestock and feed related activities

Figure 17 shows different activities in forage production and the different roles played by household members. Men dominate in most of the forage production activities, including ploughing, planting, harvesting and processing of feed. In the focus group discussions men indicated that of the proportion of people who process feeds, that men are far more involved in feed processing 70%, compared with women who are less involved 30%. However, in contrast to what men reported, women reported that they have the largest proportion (80%) of involvement in feed processing, compared with men (20%). Children and youth are often left to do other activities such as cleaning feed, watering facilities, feeding, mixing of feed and collecting off-farm forages. This enables them to concentrate on their education more.

Figure 17: Gendered division of labour related to feed production, harvesting and feeding

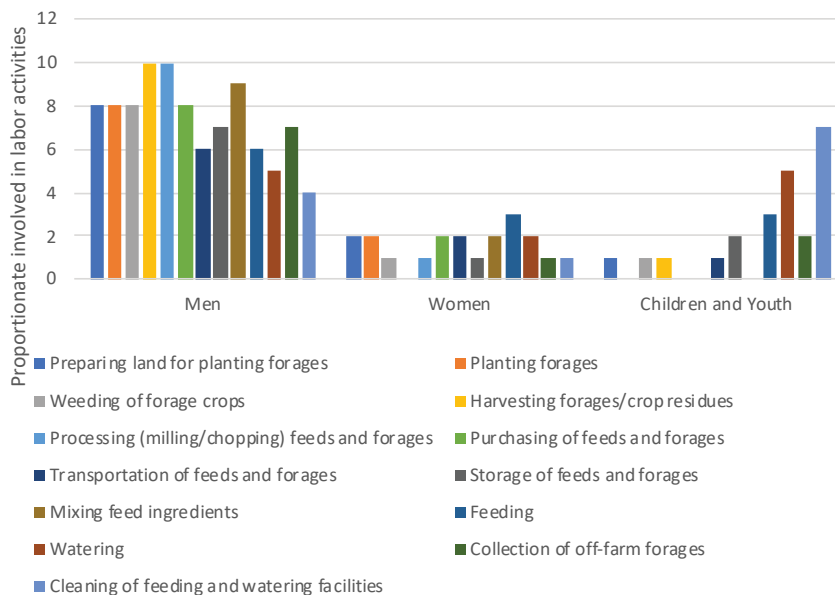
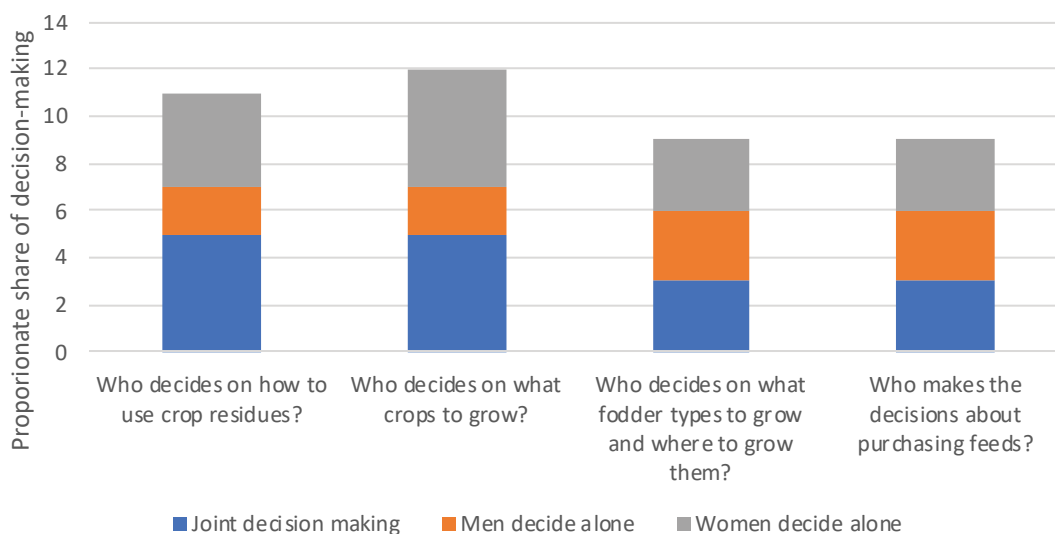


Figure 18 shows the gendered decision-making roles and how this varies between men and women, regarding crops and feed. It is evident that both men and women in a household make decisions together (considered as joint decision making) in terms of what, where and how to grow crops and feed. It is likely that both men and women participate equally in decision making in regards to production of forage crops and feed, which is evidence of gender inclusivity within households. This implies that any feed related interventions in the Mbarara District would be inclusive of both men and women.

Figure 18: Gendered decision making on crops and feeds



### 3.6 Challenges and opportunities

Table 3 shows a summary of problems and challenges that farmers face, as well as possible solutions, as suggested by farmers themselves.

- The main challenges identified by men in the community are: the incidence of livestock diseases such as brucellosis, lack of extension services, price fluctuations related to milk, feed scarcity and the theft of cattle.
- The main problems identified by women in the community are: the existence of counterfeit drugs used to treat diseases, barriers in accessing the milk market, the high cost of drugs, poor feeding practices and inefficient veterinary services.

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

Main problem	Who is affected most? (Small/medium/large farms; men/women; MHH/FHH; etc.)	Proposed farmer solutions	Ranking in Men FGD	Ranking in Women FGD
Diseases	All but mostly medium farms	Vaccination	2	3
		Proper housing and separation of animals		
		Regular spraying of animals		
Low quality feeds	Small farms	Adoption of improved high-quality forages	5	4
		Increased awareness through training		
		Irrigation in production fields		
Limited access to vet/extension services/limited knowledge of livestock management	Small and medium farms	Increasing number of extension/vet personnel	1	1
		Use of private service providers		
		Increased training by government and development partners		
Poor quality breeds	Youth and landless	Improving AI services	n/a	2
		Subsidy on AI services		
Theft of animals	All	Improving security through community policing	4	n/a



## 4. Potential interventions

Based on challenges and problems that farmers face and the solutions that they proposed, the following is a summary of proposed potential interventions:

- Train farmers on proper feed management practices such as the conservation of feed and processing techniques (e.g. haymaking and silage)
- Introduce new fodder species with higher nutritive qualities that are adapted to the local livestock production systems
- Train farmers on proper on-farm fodder, husbandry and production techniques, using practical demonstrations
- Introduce feed supplementation in grazing fields using legumes
- Introduce alternative pest and disease management mechanisms to reduce the prevalence of diseases
- Train farmers on animal nutrition to help enhance the production of high-quality milk (with an emphasis on using concentrates and minerals)
- Build the capacity of farmers throughout the local dairy cooperatives on value-added milk products and on how to improve market access and enhance price stability

## 5. Conclusion

Farmers in the Mbarara District are inclined towards dairy production and the fattening of cattle in improved and extensive production systems, therefore, the introduction of planting improved forage crops should be encouraged. Farmers should be exposed to existing forage varieties and should also be offered training on forage crop production and management. Farmers should also receive training on animal nutrition, particularly on how the introduction of balanced feed rations can result in increased livestock production. Capacity building on the provision of extension services should also be encouraged in order to promote improved animal health management. The participation of women and youth could be increased through the promotion of value-added dairy products in cooperatives - as well as in the production of commercial forage crops.

## 6. References

- Lukuyu, B., van Eerdewijk, A., Kinati, W., Sultana, N., Mulema, A. and Duncan, A. 2019. *Gendered Feed Assessment Tool (G-FEAST) focus group discussion guide*. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/100243>
- Uganda Bureau of Statistics. 2017. *National population and housing census 2014. Area specific profile series. Apac District*.