

Characterization of the livestock production system and the potential for enhancing productivity through improved feeding in Kitemba village, Hoima District, Uganda

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Methodology

The Feed Assessment Tool (FEAST) was used to characterize the feed-related aspects of the livestock production system in Kitemba village, Busiisi sub-county, in the central part of Hoima district. Busiisi sub-county is located along the Hoima-Kagadi-Kyenjonjo road, approximately 6 km from Hoima town, the district headquarters.

The assessment was carried out through a focus group discussion and completion of semi-structured questionnaires by key farmers representing owners of small-, medium- and large-scale farms on 10th and 24th of February 2015. An average of 10-15 people participated in the focus group discussion and these people were followed up with a questionnaire in their households.

The following are findings of the assessment and conclusions for further action.

Results and discussions

Farming system

The farming system is primarily subsistence and mixed crop-livestock based. The average household size is seven persons while the average size for small, medium and large farm holdings was less than 0.13 ha, between 0.8 – 1.0 ha and above 2 ha respectively. The households in Kitemba village are evenly distributed amongst these three size classes (Figure 1) and most of the land is used for arable crop production.

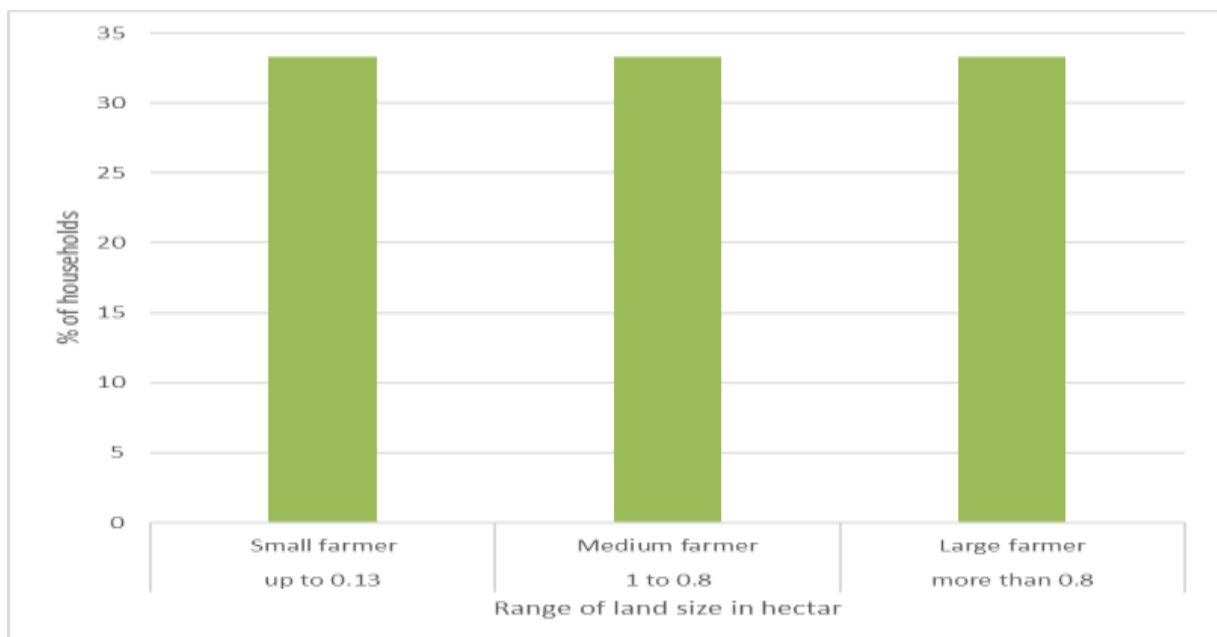


Figure 1: Land size distribution in Kitemba village

Crops grown

The major crops grown in the village include common bean, rice, cassava, sweet potato and maize. Others include tomato, finger millet, sorghum, groundnut, sunflower, banana and carrot. Cash crops include groundnut, rice, maize, cassava, tomato, banana and carrot while sweet potato, millet, and broad bean are grown mainly for home consumption. Most of these crops are commonly intercropped, except sweet potato, rice, coffee and carrot. Beans are grown by most households in Kitemba village and mostly intercropped with the other crops. Rice and cassava are the commonest food crops grown. Cassava is sold raw at harvest, processed into sliced or dried chips or sold as cassava flour. It is the staple food for the area and contributes significantly to food security. Cassava yields are double those of sweet potato. Rice is grown (for income) and on larger areas.

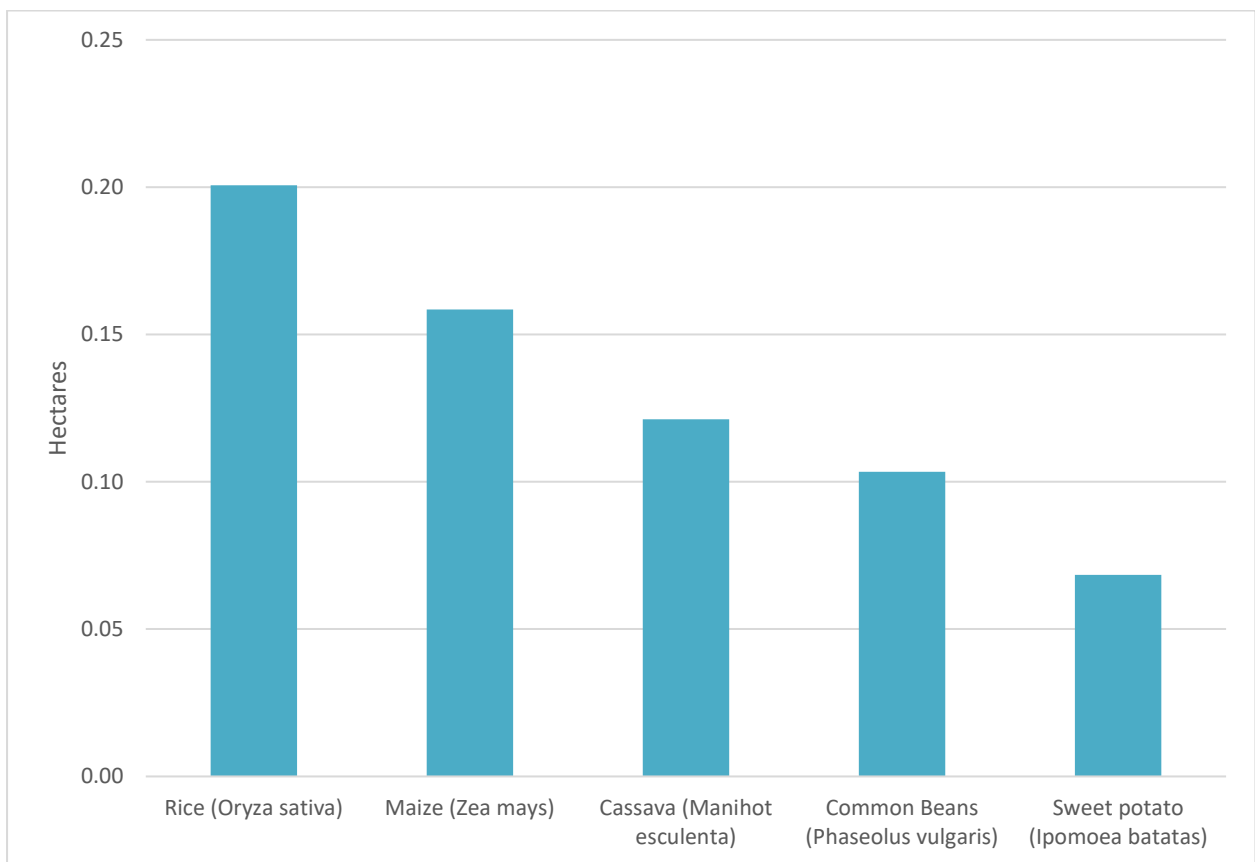


Figure 2: Crops grown in the Kitemba village

No specific forage crop is grown in Kitemba, only naturally occurring forage is collected for feeding pigs and other livestock, together with other forms of feeds.

Livestock production systems

Livestock is mainly kept for milk production and/or home consumption. Animals are mostly tethered under trees or on open fields with little or no form of permanent housing constructed by farmers. Households raise a variety of livestock including cattle, pigs, sheep and goats for various purposes. Cattle are kept mainly for milk and for cash income. The average livestock holding per household is very low with less than 1 TLU/household recorded for all species (Figure 4). Ninety percent of the farmers in Kitemba village keep pigs with an average of 2 pigs/household. Poultry are reared by 95% of households with an average of 5 birds/household. Goats are raised by 70% of households for a quick sale when funds are required and for home slaughter during social gatherings.

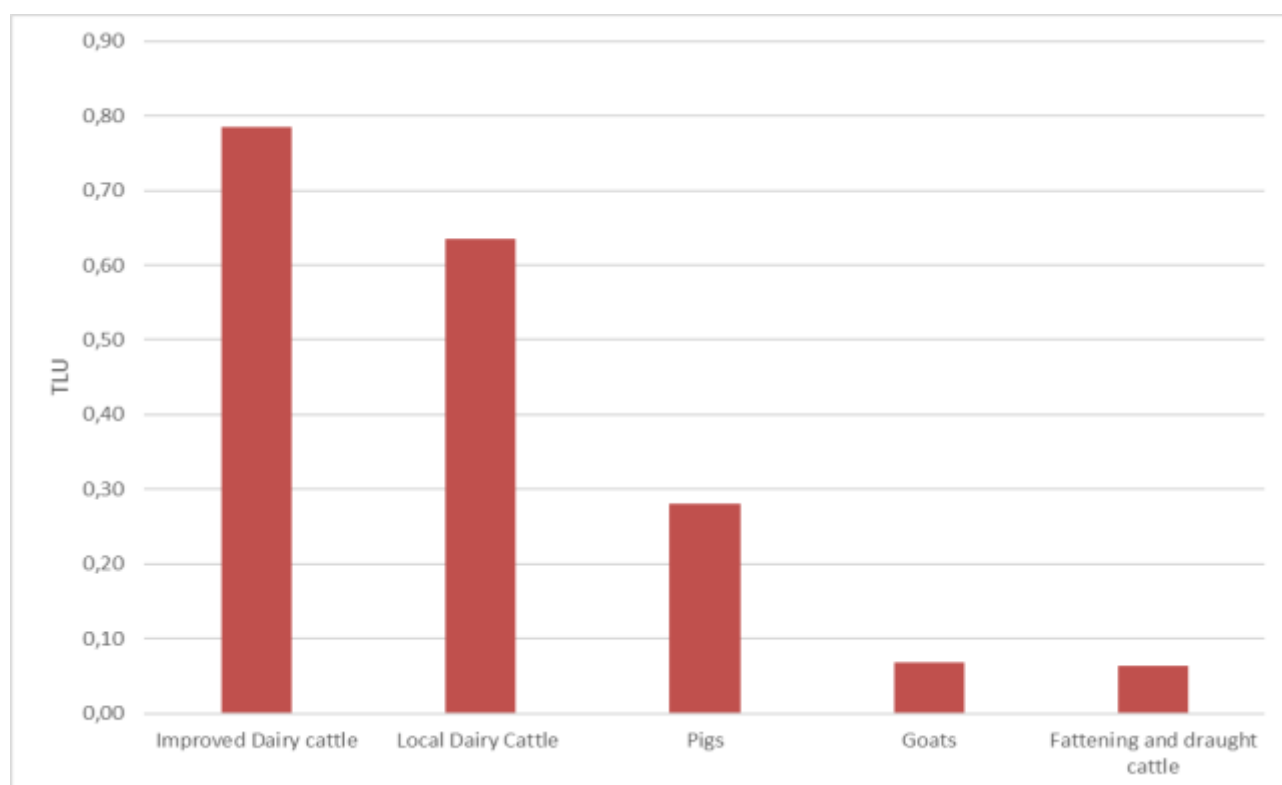


Figure 4: Average livestock holdings per household

Table 1. Types, uses and ownership of livestock

Livestock type	Primary use	% households owning type
Local dairy cows	Milk for sale, meat	10
Improved dairy cattle	Milk for sale	10
Sheep	Sale/consumption	10
Goats	Sale/consumption	70
Pigs	Sale/consumption	90
Poultry village	Sale/consumption	95

Cropping seasons

There is a bimodal rainfall pattern with two rainy seasons (Eitoigo and Ekyanda) and two dry seasons. Planting of crops is usually done during the rainy season and harvesting takes place during the dry season. Water is not a major constraint in the study area as 80% of the farmers have access to it. Small-scale irrigation is practised by using watering jugs, manual water pumps and bucket watering. This irrigation benefits mostly vegetable crops such as tomato, cabbage, eggplant and bitter amaranth.

Table 2. Cropping seasons in Kitemba village

Season	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1 st wet season (Eitoigo)												
2 nd wet season (Ekyanda)												
Dry season												

Major income sources

Agriculture is the major contributor (50%) to household income (Figure 5), as agriculture is a more diversified enterprise with sales from groundnut, rice and maize. Livestock makes an important contribution of approximately 23% of household income. Businesses account for around 11% and are represented by general merchandise shops, tailoring, pork joints and butchers. Off-farm labour (8%) and remittances (6%) also contribute to the income of households in the study area. Sale of livestock occurs when farmers need to mobilize money quickly, especially for school fees payment or for land preparation.

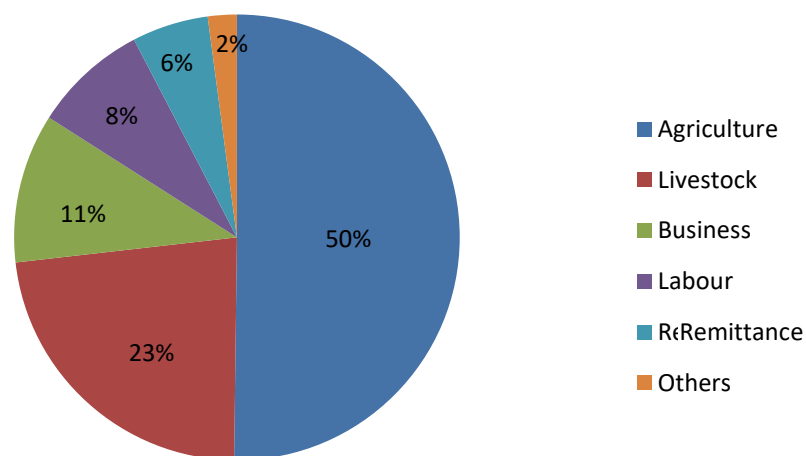


Figure 5: contribution of livelihood activities to household income

Labour is generally available all year round but mostly required in February when gardens are being prepared for planting. This involves land clearing, tilling, planting and weeding. It costs approximately UGX 60,000-75,000 (USD 16.4-20.5) to prepare 0.132 hectares of land, locally referred to as a 'Musiri'. Labour costs vary with season and farmers pay UGX 60,000 during the early season and UGX 75,000 during the late season when labour is scarce. Most farmers consider labour costs not affordable.

Feed availability

Generally, the diet for pigs in Kitemba village comprises green forage (mostly roadside weeds and naturally occurring forages), concentrates, crop residues, grazing, legume residues, kitchen waste and jackfruit. However, for Kitemba village, the feed consists of mainly concentrates, kitchen waste and forage from collected fodder. Figure 6 below shows the availability of feed resources and rainfall over an average year. Rainfall was estimated by farmers on a scale of 1-10 where 10 is abundant and 1 is very scarce. Similarly feed availability was estimated by farmers on a scale of 10-100 where 100 corresponds to abundant feed available and 10 denotes very little feed. Due to limitation of land and the urban setting grazing is not common in Kitemba, so farmers resort to tethering. Concentrates are readily available and affordable to most of the households throughout the year. However, some concentrates are generated locally as some households (keeping pigs) grow rice and maize which is sold after processing; this occurs during the dry season months of November to February. Interestingly, concentrates are fed even when there are high quantities of forage. Kitchen waste is also available in January and February when cassava and sweet potato are harvested and processed by peeling and drying for sale.

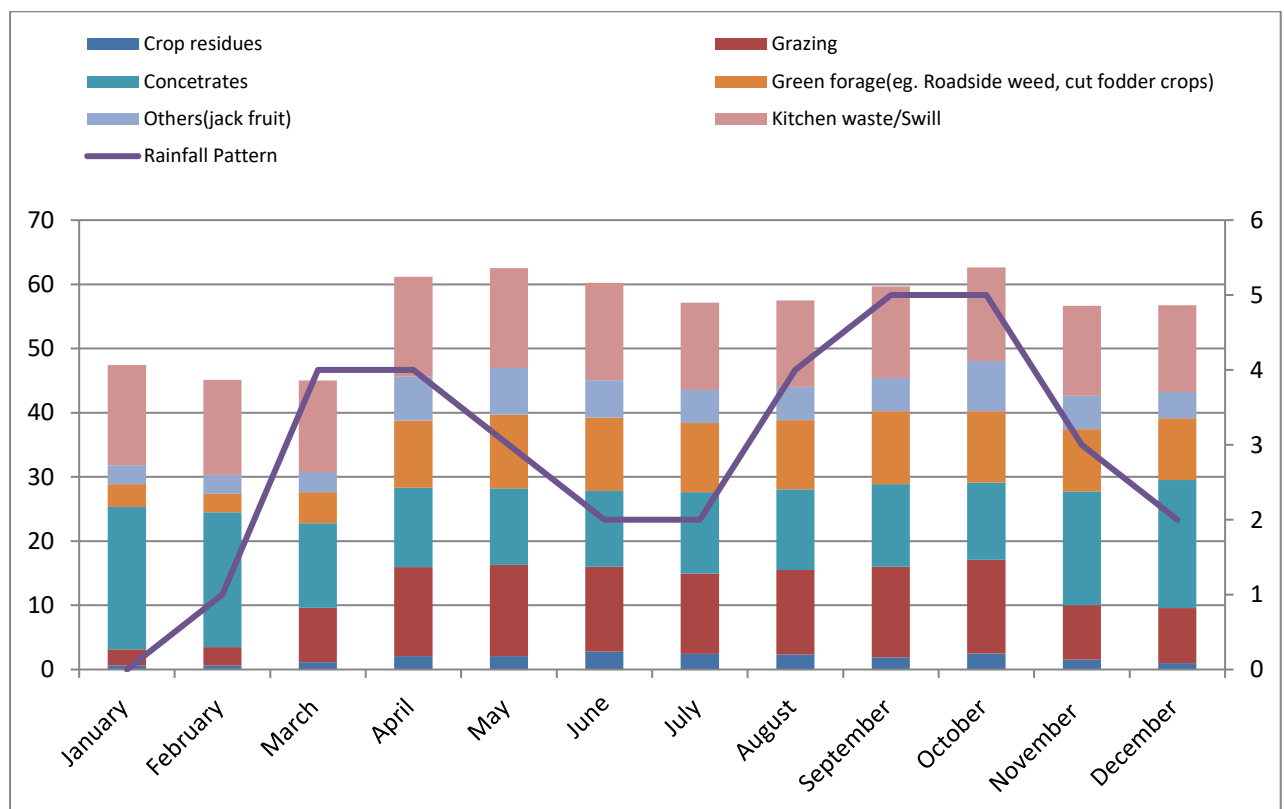


Figure 6: Availability of feed resources and rainfall during the year

Purchased feeds

Rice bran (82%) and maize bran (18%) constitute the purchased feeds in Kitemba. The contributions of the different feeds to dry matter (DM), metabolizable energy (ME) and crude protein (CP) are shown in Figures 8, 9 and 10 respectively. Crop residues and grazing account for 60 – 72% of DM and ME of animal diets, while purchased feeds make a significant contribution to CP.

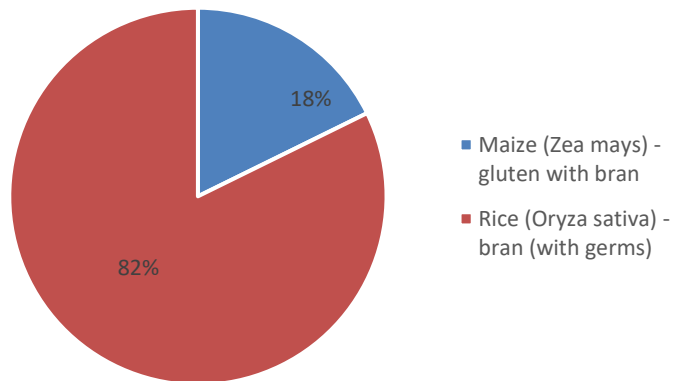


Figure 7: quantity of feed purchased over a 12 months period

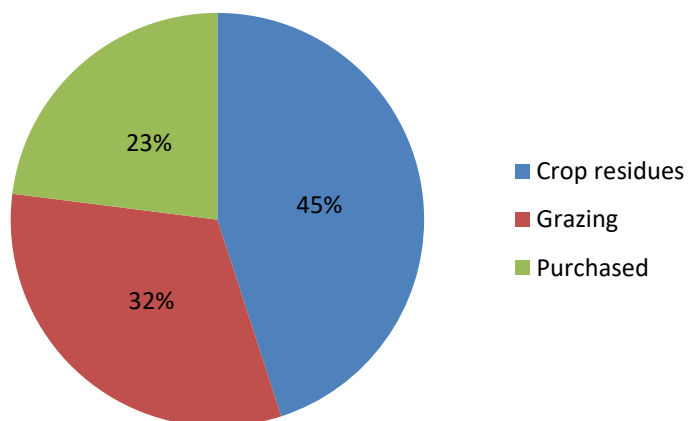


Figure 8: The contribution of dietary dry matter to the total diet on-farm in Kitemba village

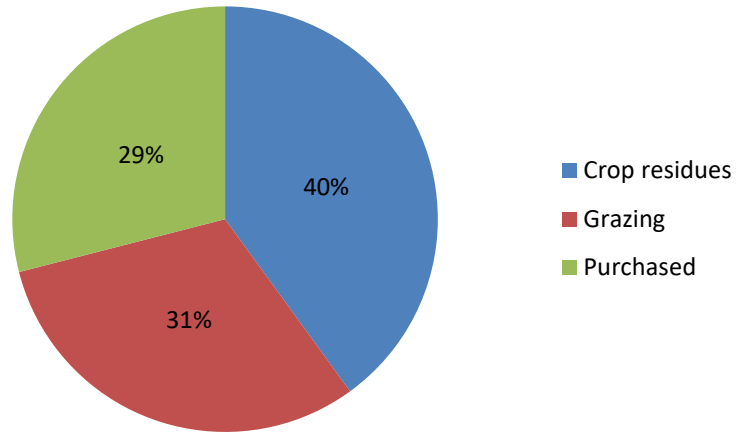


Figure 9: The contribution of dietary metabolisable energy to the total diet

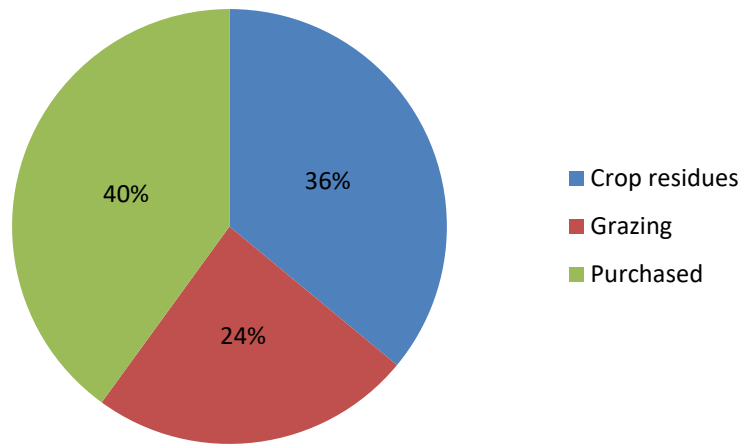


Figure 10: The contribution of dietary crude protein to the total diet

Key challenges and suggested interventions

The major challenge to pig production is insufficient feeds due to expensive and seasonal concentrates like maize and rice bran. Diseases such as African swine fever, mange and worm infections are a major challenge to increased production and productivity of livestock. Theft of pigs, price fluctuation of live pigs on sale and unavailability of housing material also hinder the development of the pig industry in Kitemba. Farmers attribute price fluctuation to changes in seasonal demands (festive and non-festive).

A summary of the challenges and suggested interventions are shown in Table 3.

Table 3. Key challenges and suggested interventions

Rank	Challenges	Suggested interventions by farmers
1.	Insufficient feeds. Farmers consider the cause as: -Concentrates such as maize and rice bran being seasonal and expensive -Limited land for growing cereals -Farmers reluctance to prioritize tuber and forage crops purposely for pigs.	- Grow cereal crops; maize, rice, sorghum for concentrates - Grow tuber and forage crops; sweet potato, yam, cassava, for both forage and tubers - Engage in market-oriented pig production
2.	Diseases of pigs	- Consult the Veterinary Officers monthly for health care
3.	Theft of pigs	- Construct permanent pig pens - Get guard dogs
4.	Inadequate health services	- Constitute pig farmers' groups to demand and pay for health services
5.	Unavailability of housing materials	- Construct piggery structures using local materials

To mitigate feed constraints there is a need to produce more feeds per hectare. Farmers consider that the main limiting factor is the lack of land to produce enough feeds.

Most farmers have not allocated enough land area to the production of feeds. To mitigate this, efforts to expand the land area for feed production are essential. Feed crops such as maize, rice and sorghum can be used as concentrates, while tuber crops such as sweet potato and yam have vines that can be used as crop residues. Price fluctuation in the pig market will not be solved by increased feeding, but part of the money from maize and rice sales could be used to improve piggery structures. Buying timber material and acquiring improved pig breeds for enhanced production and productivity can be realized through organized marketing of pigs and their by-product (manure).

Currently, more than 70% of farmers use concentrates, either purchased or from their own produce. There is further potential to conserve excess forage and tubers, which could make feed delivery chains effective and improve access to concentrates.

To mitigate the high incidence of animal diseases, efforts need to be made to increase animal health service providers such as local drug shops, increase the number of vet workers and enhance sensitization on control of diseases. However, some of the disease interventions are beyond the scope of what farmers can do themselves, thus will require institutional interventions such as possible development of a vaccine against African swine fever.

Conclusions

Sales from pig raising are one of the main contributors to household income in this subsistence-based mixed crop-livestock system. About 90% of households in this area have 1-3 pigs and some of them are improved breeds.

The main constraint to the further intensification of pig raising is lack of feeds, especially before the harvesting of cereals for concentrates and tuber crops. Farmers are reluctant to allocate larger proportions of their landholdings to feed production. Therefore, suggested interventions are better training to improve feed (tuber and fodder), training on preservation techniques and to enhance concentrate feed production and delivery chains.