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Livestock production systems spotlight

UGANDA

Chicken meat and beef



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Livestock Production Systems Spotlight

Beef and Chicken Meat

1. Introduction

Policies and investments in the livestock sector are effective when they take into account the multiple dimensions of livestock farming. These dimensions include monetary and non-monetary benefits for producers and other actors along the value chain, such as income, food, draft power and insurance. They also include public health and environmental dimensions, such as the availability of protein for good nutrition and health, the use of dung for fertilizing soil, or the negative impacts of zoonotic diseases on public health and the consequences of overgrazing for the environment.

A multi-stakeholder multi-disciplinary approach is a precondition for designing and formulating effective livestock policies and investments, which consider and manage the trade-offs inherent in the multiple dimensions of the sector. When stakeholders, looking at the livestock sector from different perspectives, share a common understanding of the livestock production systems – agreeing on common descriptions of the production systems and sub-systems – they can arrive at constructive conclusions about the pros and cons of alternative policy actions and investments.

This brief presents a snapshot of the Beef and Chicken Meat production systems in Uganda as defined and characterized by key national stakeholders affected, and notably the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), the Ministry of Water and Environment (MoWE), the Ministry of Health (MoH) and the Office of the Prime Minister (OPM). It is the first time these stakeholders have ever embarked in a multi-disciplinary process to jointly define Beef and Chicken Meat production systems. This process involved a three-step approach:

- Based on their knowledge and expertise, the stakeholders agreed on a narrative description of the multiple cattle beef and chicken meat production systems.
- Stakeholders have then validated and improved Beef Cattle and Chicken distribution maps of the FAO Gridded Livestock of the World (GLW) and identified, for each administrative unit, the relative proportions of the different production systems (e.g. 60% extensive and 40% semi-intensive).
- Stakeholders have assembled datasets, policy documents, and published and unpublished literature on and generated statistics on the defined Cattle Beef and Chicken Meat production systems. Geographic variables have allowed adding “add-up” consistently information from different sources.

This approach, while not perfect, has three strengths:

- It is stakeholder driven, as stakeholders ex-ante define the different livestock production systems.
- It allows “adding-up” scattered information by using geographical locations as the common denominator.
- Its outputs can easily be visualized through combining maps and bar charts.

2. Why Beef and Chicken Meat production systems?

As part of the implementation of Africa Sustainable Livestock 2050¹, the Ministers responsible for livestock, health and environment have engaged stakeholders to assess the current and long-term

¹ <http://www.fao.org/ag/againfo/programmes/en/ASL2050.html>

impact of livestock production systems on the economy and people's livelihoods, on public health and on the environment. To start with, they have agreed to focus on two livestock commodities. Beef and Chicken Meat were selected because of their relevance for the national economy and people's livelihoods, priority in the current policy framework, and their anticipated growth in the coming decades.²

3. The Beef Sector in Uganda

Cattle are the most important source of meat in Uganda. The greatest concentration of animals is found in the "cattle corridor", extending from South-Western to North Eastern Uganda (UIA, 2016). The number of cattle, for all purposes, in Uganda are shown in *Table 1*. The majority of cattle farmers are smallholders who rear cattle primarily for milk production, most of which is consumed at home, and to some extent for beef production. This is evidenced by the fact that most cattle in Uganda are indigenous and female. As to beef production, cattle farmers sell cattle to traders or butchers in a one-off transaction. The production sub-systems for beef in Uganda are classified in commercial ranching, pastoral, agro-pastoral and semi-intensive. The country annually produces 185 709 metric tons of beef with the per capita consumption averaging about 9 Kg per year. Consumption is higher in Kampala than any other town or district, with the capital city accounting for 7% of all national consumption (ZDCO, 2017).

Table 1. Number of cattle in Uganda

Region	Cattle Number (Million)	Percentage
Western	2.4	22.3
Eastern	2.5	21.8
Central	2.5	21.7
Karamoja	2.3	19.8
Northern	1.6	14.4
Total	11.4	100

Source: MAAIF and UBOS (2008)

3.1 Beef Production Systems

Commercial Ranching

Ranching production system gathers large number of animals in perimeter fencing and paddock structures. Substantial investment is made in animal health management and breeding.

- Commercial ranching accounts less than 10% of the national herd (UIA, 2016). This system is mainly found in the South Western and Central Regions.
- Ranches manage herds that range from 500 to 3 000 heads of a mixture of indigenous, cross and exotic breeds. Exotic and improved breeds are usually imported from Kenya, South Africa and Europe (Mpairwe *et al.*, 2015).
- Cattle are kept in confined fences and paddocks (ACET, 2014), and fed with natural or improved pastures. Some ranches provide supplementary feeding in form of mineral salts, maize bran, maize silage and molasses (Asizua *et al.*, 2009).
- Commercial ranchers invest in infrastructure, such as feed and water troughs, spray races, dip tanks and sometimes even valley dams.
- While investments are made to maintain healthy animals, diseases often affect cattle in commercial ranches, such as Anthrax, Rabies, helminths (*Trichinosis*, *C. Bovis*), Bovine TB, Brucellosis, FMD, CBPP and LSD.

²ASL2050 (2017) *Country brief Uganda*. FAO, Uganda.

- Yield (carcass weight) for beef cattle at maturity is about 145-150 kg, with each Kg. valued at 9 400 Uganda shillings (approx. USD 2.6) (Asizua *et al.*, 2009).
- There are three major marketing channels in ranching system. First and commonly, ranchers sell their cattle directly to abattoirs serving domestic and international markets. Second, ranchers sell to butchers specialized in quality beef for niche local markets. Finally, some ranchers sell animals to street butchers (Mpairwe *et al.*, 2015).

Ranching subsystem have opportunities for growth. Local demand for beef is still unsatisfied; an organized Meat Producers Cooperative Union facilitates dialogue between the private and the public sector. The Union, established in 2008 under the Guidance of the Ministry of Agriculture, Animal Industry and Fisheries and currently bringing together over 2 600 beef farmers, provides a framework for a platform to enhance beef meat production, productivity and quality assurance. Uganda has also livestock breeding institution and Animal Breeding Act (2000) in place that aim at improving accessibility to quality beef breeds, a key pillar for enhancing beef production, productivity and quality.

Pastoral production systems

In pastoral systems cattle move from place to place in search of pastures and water.

- Around 90% of the national cattle herd is kept under pastoral and mixed smallholder farms (UIA, 2016). The pastoral system is dominant in the North Eastern sub-region (Kotido, Moroto, Soroti and Kumi) in the South West sub-region (Ntungamo, Mbarara, Masaka, Sembabule and Rakai Districts), and in Central Uganda (Luwero and Kiboga Districts) (Mwebaze *et al.*, 2011).
- Pastoralists keep herds of variable size, that goes up to 100 heads per person. Herds are largely (98%) composed of local breeds (e.g. Ankole and local zebu) (Mwebaze *et al.*, 2011). Animals are kept in kraals or enclosures, or in open space.
- Cattle largely feed on natural pastures (Asizua *et al.*, 2009), including communal grazing areas and fallow land. Occasionally, animals are fed with crop residues. Pastoralists, therefore, have little control over the feed resources available for their animals (Kugonza *et al.*, 2011).
- Pastoralists have limited access to animal health services and, in many cases, animals are only vaccinated during governments vaccination campaigns. Common cattle diseases in pastoral areas are contagious bovine pleura pneumonia, Brucellosis and tick-borne diseases (Queenan *et al.*, 2016). In the Karamoja Region, high herd prevalence of tuberculin reactions has been recorded (Inangolet *et al.*, 2008).
- Carcass weight at slaughter for adult animals is about 110-120 kg.
- Milk and meat are the main sources of livelihood for pastoralists. Milk is self-consumed or sold; live animals are sold in livestock markets or to traders for slaughtering and beef production (Mwebaze *et al.*, 2011).

As pastoral systems provide lean meat they have major opportunities to growth in the medium to long term, when consumer preferences are expected to move towards healthier diets. However, the difficulties for the public and private sector to provide goods and services in low-densely populated areas make it difficult for pastoralists to tap into existing and coming market opportunities. It is only by articulating policies and investments that support strong linkages between pastoral and non-pastoral areas that this system will thrive in the medium to long term and increasingly supply animal source foods to the growing Uganda population.

Agro-pastoral production systems

In agro-pastoral production systems, cattle graze in private or public pastures and provided with additional feed material, particularly crop residues. Agro-pastoralists produce beef, milk as well as other products such as blood and hides [28].

- Agro-pastoralists are present in the East Central, Mid-Western, Mid-Eastern, Mid Northern and West Nile Regions. Available data suggest there are about 8 million of agro-pastoral livestock keepers (UBOS, 2014).
- The average herd size comprises around 10 cattle (Ocaido *et al.*, 2005). Animals are mainly of indigenous breeds, with some cross breeds, such as between East African Zebu and Holstein Friesian and Ankole and Holstein Friesian.
- The main feed resources are public and private natural pastures (ACET, 2014), which makes often unpredictable the quantity and quality of biomass available for grazing animals. By products from cereals such as maize, sorghum and millet, are also fed to cattle.
- Cattle are kept in kraals, bomas or open areas.
- Agro-pastoralists invest limited resources for prevention and treatment of animal diseases, with animals vaccinated mainly against FMD (36%) and CBPP (21%). Few have spray pumps (25%), crushes (9%), or drench guns (2%). Common diseases are East Coast Fever (ECF), anaplasmosis, tick-burdens, trypanosomiasis, Foot and Mouth Disease (FMD), CBPP and brucellosis (Ocaido *et al.*, 2005).
- The carcass weight at slaughter ranges from 120 to 130 kg per head.
- Agro-pastoralists sell beef animals, including non-reproductive cows, to traders either at the farm gate or in primary livestock markets. Transaction costs are usually high and negotiations based on visual estimations of animal weights (Mpairwe *et al.*, 2015). As the major beef market in the country is Kampala, agropastoralists have scant information on the retail price for beef, and hence limited bargaining power in market transactions. While accurate statistics are not available, there is evidence that agro-pastoralists informally sell their animals when trade restrictions are in place: for example, in Rakai district informal sales accounted for 15.2% of all sales when an FMD quarantine was enforced (Mpairwe *et al.*, 2015).

Agro-pastoral systems face the usual challenges of low-input low-output systems: they are poorly integrated with markets with limited access to goods and services, which results in low yield and profitability. In addition, as agro-pastoralists are currently poorly organized, there is risk they will not be in a position to fully benefit from the growing markets for beef products in Uganda.

Semi-intensive cattle production system

In semi-intensive systems farmers keep cattle confined and provide them with fodder, compound feed as well as crop residues. The major products include milk and beef.

- Semi-intensive systems are not so common in Uganda, comprising less than 10 % of the national herd (Mwebaze *et al.*, 2011). Farmers in this system are mainly located in Central 1, Central 2 and in the South Western sub-regions, and in peri-urban areas.
- Average herd size varies. It is between 1 to 5 animals for small farms; between 5 to 15 animals for medium farms, and of more than 20 animals for large farms (Mwebaze *et al.*, 2011). In most cases, animals are crossbreeds of East African Zebu and Holstein Friesian.
- Animals are largely kept for producing milk, with beef production mainly originating from no-longer productive female cattle.
- Farmers keep animals in confined sheds and paddocks (ACET, 2014), with cattle fed with forage, compound feed and crop residues when available.

- Farmers invest in animal health, including disease prevention and treatment. Indeed, the prevalence and incidence of diseases are usually low in intensive systems.
- Carcass weight for beef cattle at slaughter is around 135-140 Kg with each Kg valued 9 400 Uganda shillings (approx. USD 2.6) (Asizua *et al.*, 2009).

Semi-intensive systems are among the most efficient in Uganda, particularly when well-integrated with crops. Not only farmers can feed animals with crop residues which would otherwise be wasted, but also use animal dung to improve soil fertility. However, productivity in this system is still low because of difficulties for farmers in accessing affordably-priced and quality inputs and services, such as AI (ACET, 2014).

Figure 1. Distribution of beef cattle in Uganda by region and production system

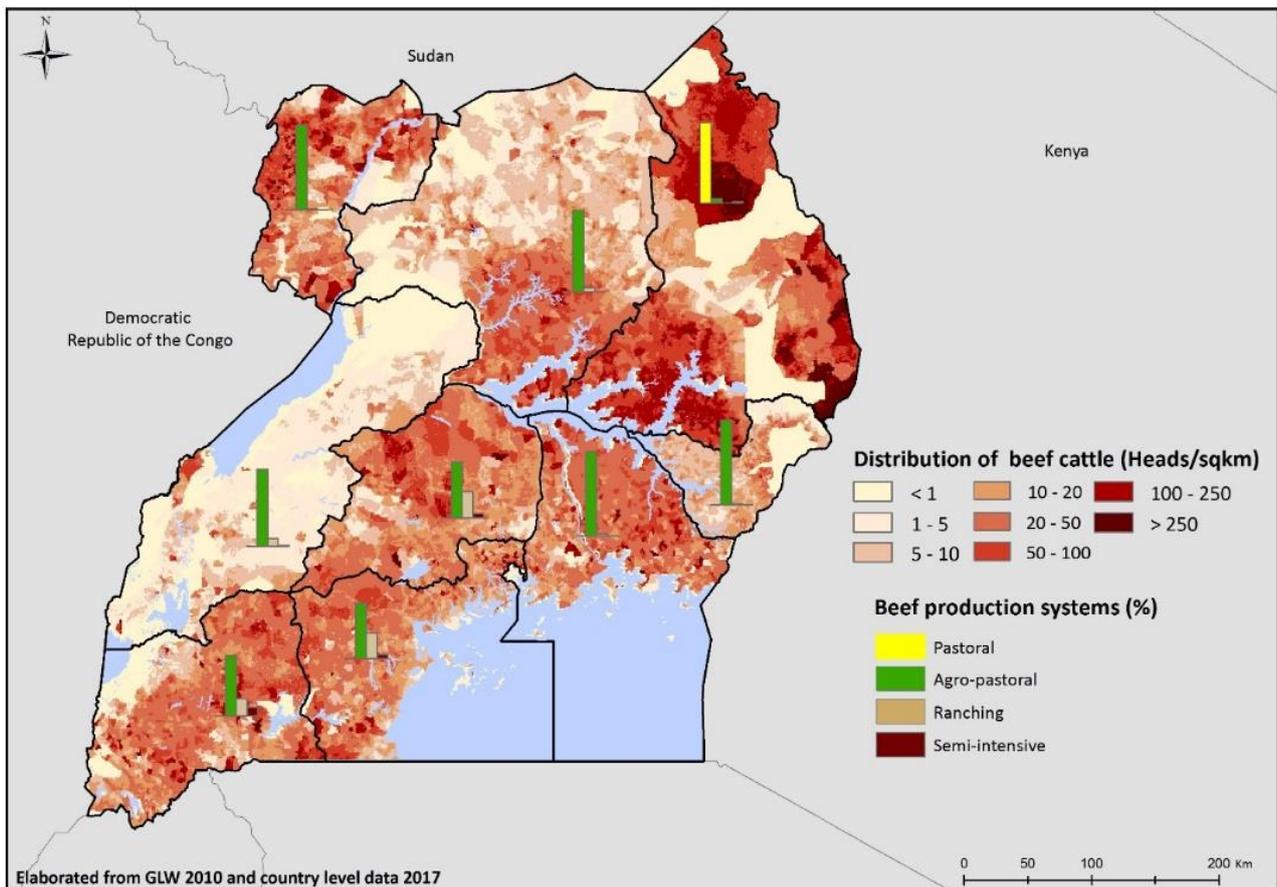


Table 2. Estimation of total number of cattle for beef production by region and production system

Region	Agro pastoral	Ranching	Semi intensive	Pastoral	Agro pastoral (%)	Ranching (%)	Semi intensive (%)	Pastoral (%)
Central 1	287 798	132 830	22 138	-	65%	30%	5%	0%
Central 2	406 572	187 649	31 275	-	65%	30%	5%	0%
East Central	570 411	11 641	-	-	98%	2%	0%	0%
Mid-Eastern	75 494	763	-	-	99%	1%	0%	0%
Mid-Northern	656 490	34 552	-	-	95%	5%	0%	0%
Mid-Western	108 057	10 806	1 201	-	90%	9%	1%	0%
North East	146 982	-	29 396	2 763 263	5%	0%	1%	94%
South Western	449 081	128 309	64 154	-	70%	20%	10%	0%
West Nile	620 244	6 265	-	-	99%	1%	0%	0%

Note: Data based on GLW (2010) and expert estimation on beef production systems by sub-region.

4. Chicken Meat Production Systems

The total chicken population in Uganda is estimated at 37.4 million birds, of which more than a half are located in the Eastern and Central regions (Table 3). Eighty five percent of all chicken are indigenous, with only 15% being exotic.

Table 3. Number of chicken in Uganda (UBOS, 2008)

Region	Cattle Number (Million)	Percentage
Central	10.5	28.0
Eastern	10.7	28.6
Northern	7.6	20.4
Karamoja	1.4	3.6
Western	7.2	19.3
Total	37.4	100

Source: MAAIF and UBOS (2008)

There are three major chicken production systems in Uganda: free range, semi-intensive and intensive systems (Table 4). Figure 2 portrays their relative weights in the country sub-regions.

Free Range Chicken System

In free range production, farmers leave indigenous chicken scavenging around for food and keep them for a multitude of purposes, including meat production.

- About 50% of the Uganda population or 3.8 million farmers are estimated to keep scavenging poultry (UBOS, 2014). The free-range system is present throughout the country, though more pervasive in the West Nile and South West sub-regions (UBOS, 2008).
- Farmers typically keep a flock of about a dozen birds, including hens (6), cocks (3) and cockerel and chicks (4) (Kugonza *et al.*, 2008).
- While during the day birds freely roam around, during the night close of 80% of households keep the birds in their home, with the remainder letting the chickens perch in trees.
- Birds roam the entire day in search of water and feed, though farmers also provide them with kitchen and crop residues.

- Farms make little if any investments to prevent and control animal diseases. Major diseases include Newcastle (NCD), Gumboro, Marek's and Fowl pox, Avian Influenza and Salmonellosis. Birds are also affected by external and internal parasites, often treated with local remedies (e.g. paraffin application to clean off external parasites and herbs for internal ones) (Nalubwama *et al.*, 2011).
- At maturity, an adult cock weighs 1.7-2.4 Kg and an adult hen 1.2-1.6 Kg (Ssewanyana *et al.*, 2008).
- Farmers keep poultry mainly for subsistence. They consume eggs and sale live birds or exchange them as a means of payment. In particular, 36% of chickens are self-consumed, 33% are sold for cash, 16% are used for ceremonies, 13% are given away as gifts and 2% are used for other purposes (Ssewanyana *et al.*, 2008).

Free-range poultry production systems are pervasive in Uganda but not much productive. Inappropriate feeding, animal health and housing practices reduce productivity and negatively impact on mortality rate. Minor but widespread investments to improve husbandry practices would be thus expected to significantly improve productivity and the benefits households can derive from their relatively small flock of birds. This is particularly true when households raise improved breeds are raised, such as the Kuroiler breed that is more productive than local breeds and yet does maintain indigenous traits that makes it a good scavenger.

Semi-Intensive Chicken System

Semi-intensive chicken production systems produce meat (broiler) and eggs (layer) for the markets.

- Semi-intensive poultry systems are mainly found in peri-urban areas of the East Central and Mid Northern sub-regions. There are not exact data on the number of households engaged in this production practice, but estimations based on UBOS (2014) quantify the number of farms at around 70 000
- Farmers keep small to medium size flocks, ranging from a few dozens to over a hundred birds (Illango *et al.*, 2002). Birds are crossbred or exotic.
- Feeding practices include a combination of controlled free range and feed supplementation (maize based commercial feeds, kitchen wastes, green herbage, crop residues and termites in the agro pastoral zone). Availability of feed supplementation reduces during the dry season in districts such Soroti or Mbale (Illango *et al.*, 2002).
- Housing systems vary from rudimentary wooden shelters to concrete structures.
- As far as possible, farmers invest in animal health practices, particularly in vaccination. Newcastle disease, however, often affects poultry in this system along with Gumboro, Marek's and Fowl pox, Avian Influenza and Salmonellosis.
- Investments in housing, feeding and animal health translate in higher productivity, both in terms of weight gains and number of eggs. Data are not available on productivity level in this system, which is however higher than that in the free-range system.
- Grown birds and eggs are sold to the market, in most cases through traders.

The semi-intensive poultry system presents major opportunities for growth in Uganda, because both it requires relatively little investments to set up a small-scale poultry farms and because of the growing demand for chicken meat in the country. However, producers are still poorly organized and a system does not yet exist for the regular provision of inputs and services for semi-intensive poultry producers throughout the country.

Intensive Chicken System

The intensive poultry production system commercially-oriented which major products being meat and eggs. Farmers and enterprises raise chickens but also turkeys, ducks, guinea fowls and pigeons (Olaboro, 1990).

- Intensive poultry systems are common in Central 1, Central 2 and East–Central sub-regions, particularly in urban and peri-urban areas. The number of farms is estimated at around 1 700 (UBOS, 2014).
- In the Kampala region, poultry enterprises vary from small (50-500 birds) through medium (500-1 000 birds) to large (more than 1 000 birds). Large farms, however, are not common (Olaboro, 1990). Birds are exotic.
- Birds are fed largely with maize, with feed composition varying along the bird growing period. Feed represents about 60-70% of total production cost.
- Birds are raised in concrete permanent structures.
- Birds are vaccinated before entering the production cycle and, if need be, treated against any major diseases that might affect them. For example, broilers are vaccinated against Newcastle and Gumboro in the first four weeks of life.
- The intensive system is an all-in all out systems with birds reaching maturity within a period of 6 to 8 weeks. At slaughter birds weigh from 1.6 to 2.2 Kg.
- Broilers are slaughtered and sold packaged or unpackaged to butcheries as well as supermarkets.

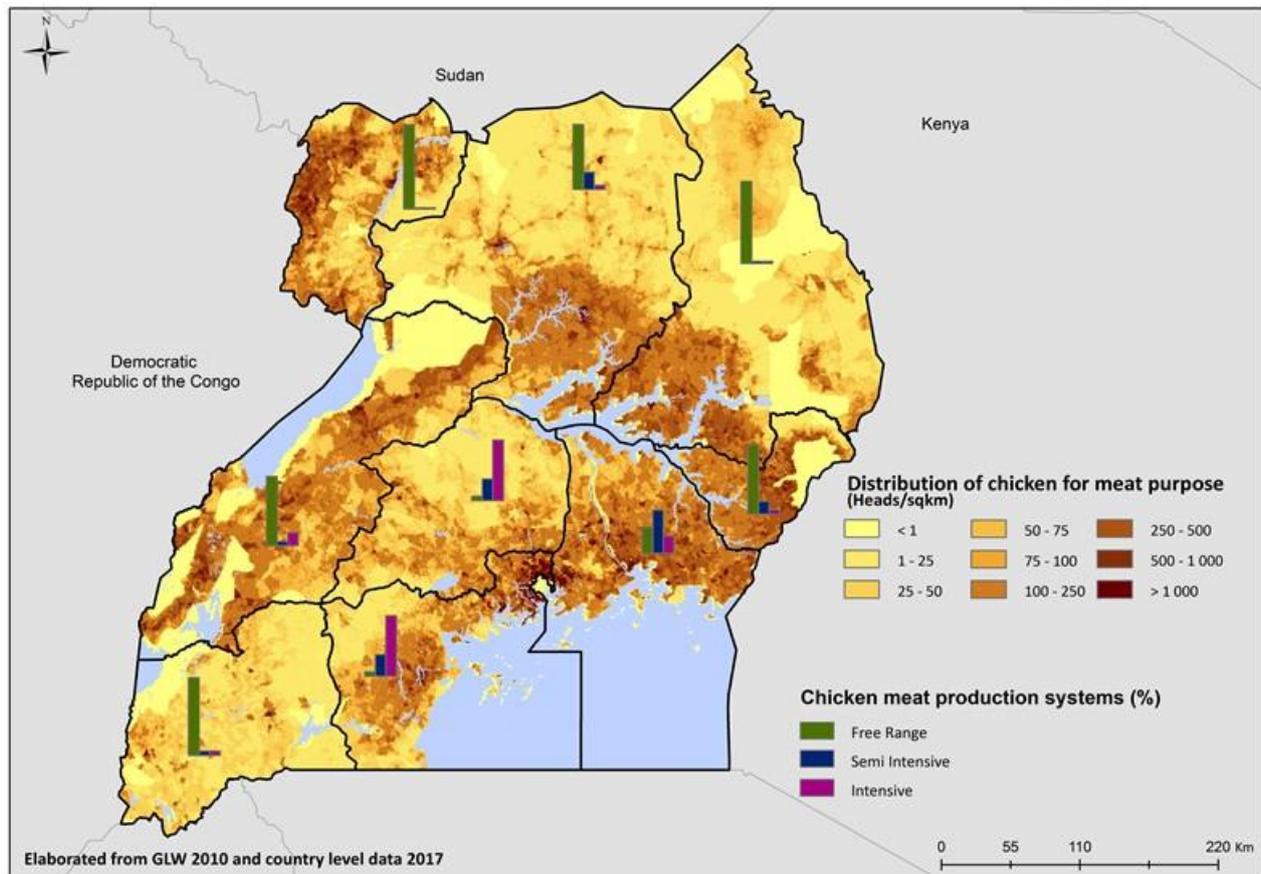
Intensive chicken production systems are anticipated to grow fast in Uganda, provided an enabling environment, in terms of infrastructure and finance, is established. Feed represents the major constraint the development of intensive poultry production systems.

Table 4. Estimation of total number of chickens for meat production by region and production system

Region	Free-range	Semi intensive	Intensive	Free-range (%)	Semi int (%)	Intensive (%)
Central 1	185 773	928 865	2 600 823	5	25	70
Central 2	61 681	308 404	863 532	5	25	70
East Central	1 130 482	1 884 137	753 655	30	50	20
Mid-Eastern	1 105 987	207 373	69 124	80	15	5
Mid-Northern	2 280 443	608 118	152 030	75	20	5
Mid-Western	3 237 592	202 350	607 049	80	5	15
North East	2 884 398	75 905	75 905	95	2.5	2.5
South	628 060	34 892	34 892	90	5	5
West Nile	2 360 421	36 501	36 501	97	1.5	1.5

Source: Data based on GLW (2010) and expert estimation on chicken meat production systems by region.

Figure 2. Chicken distribution in Uganda by region and production system



4. Conclusion

This brief presented a snapshot of Beef and Chicken Meat production systems in Uganda, as described and characterized by the MAAIF, MoH, MoWE, OPM and other stakeholders, such as the National Livestock Resources Research Institute (NaLIRRI), the National Animal Genetic Resources Centre and Data Bank (NAGRC & DB), District Local Government Technical Staff, the Uganda Veterinary Association (UVA) and AgriProfocus (APF).

A common understanding of livestock production systems facilitates multi-sectoral and multi-disciplinary dialogue among stakeholders, which is essential to design policies and programmes that appreciate the tradeoffs associated with livestock sector growth and transformation. This brief, therefore, represents a first step toward the design and implementation of effective and inclusive livestock sector policies and strategies.

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