



FEWS NET

FAMINE EARLY WARNING SYSTEMS NETWORK

UGANDA STAPLE FOOD MARKET FUNDAMENTALS JANUARY 2017



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About FEWS NET

Created in response to the 1984 famines in East and West Africa, the Famine Early Warning Systems Network (FEWS NET) provides early warning and integrated, forward-looking analysis of the many factors that contribute to food insecurity. FEWS NET aims to inform decision makers and contribute to their emergency response planning; support partners in conducting early warning analysis and forecasting; and provide technical assistance to partner-led initiatives.

To learn more about the FEWS NET project, please visit <http://www.fews.net>

Acknowledgments

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Acronyms and Abbreviations

CIF	Cost insurance freight
CV	Coefficient of variation
COMESA	Common Market for Eastern and Southern Africa
DHS	Demographic and health survey
DRC	Democratic Republic of the Congo
EAC	East African Community
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEWS NET	Famine Early Warning Systems Network
FOB	Freight on board
GDP	Gross Domestic Product
ha	Hectare
kg	Kilogram
IDP	Internally Displaced Person
IFPRI	International Food
MAFAP	Monitoring and Analyzing Food and Agricultural Policies (Program)
MAAIF	Ministry of Agriculture, Animal Industry, and Fisheries
MEMD	Ministry of Energy and Mineral Development
MoFPED	Ministry of Finance, Planning and Economic Development
mm	millimeters
MSGGA	Masindi Seed and Grain Growers Association
MT	Metric Tons
RM	Remote monitoring
UBOS	Uganda Bureau of Statistics
UGT	Uganda Grain Traders
UGX	Ugandan Shilling
UNBS	Uganda National Bureau of Standards
UNFFE	Uganda National Farmers Federation
US	United States
USAID	United States Agency for International Development
USD	United States dollar
USGS	United States Geological Survey
WFP	World Food Program
WTO	World Trade Organization

Key Concepts

The following provides the definitions of several key terms used throughout the report. For more detail on these definitions and other useful terms, consult the [FEWS NET Markets and Trade Glossary](#).

Marketing system: This includes the entire commodity distribution system from production to consumption. A marketing system describes the key actors and the linkages between different stages of the distribution process of a given commodity. The marketing system also describes the spatial and functional relationships between market actors.

Marketing year: This refers to the period during which agricultural production from a given year's harvest is sold. This period typically extends from one harvest of a particular commodity to the next, and is very similar to the consumption year used in FEWS NET's livelihoods work in many cases.

Price: The cost or value of a good or service expressed in monetary terms. It is the financial cost paid when one buys a unit of a specific product or service. Prices, in the purest sense, indicate value that has been added to a particular commodity. This value added can be changes in the form (e.g., production or milling), place (e.g., transportation), or time (e.g., storage) of a commodity. Price signals can carry information about cost of production, transportation, storage, perceptions and desires as well as, in some instances, distortions

Incentive: Something that incites an action or provides a motive (e.g., potential profits, benefits or gain from performing a particular economic activity).

Food balance sheet: This presents a comprehensive picture of the pattern of a country's food supply during a specified reference period. A food balance sheet shows for each food item - i.e., each primary commodity and a number of processed commodities potentially available for human consumption - the sources of supply and its utilization

Commodity balance sheet: This shows balances of food and agricultural commodities in a standardized form. The scope of standardization is to present these data in a less detailed form for a selected number of commodities without causing any significant loss of the basic variables monitoring the agricultural sector. The selected commodities include the equivalents of their derived products falling in the same commodity group, but exclude the equivalents of by-products and derived commodities, which through processing, change their nature and become part of different commodity groups.

Unimodal areas: Unimodal areas are agro-ecological zones with one distinct rainy season with one rainfall peak and typically a single harvest.

Bimodal areas: Bimodal areas are agro-ecological zones with either a single prolonged rainy season with two rainfall peaks or two or more distinct rainy seasons (which could each be unimodal or bimodal), resulting in two or more harvests. The amount of rainfall can be equivalent between rainy seasons or one may be dominant (for all commodities or for a single crop), resulting in differing yields between seasons.

Commodity classifications

Commodity-specific classifications of surplus and deficit areas are established based on historical production figures and on FEWS NET staff and key informants' knowledge of the consumption patterns of particular areas of a given country. When surplus and deficit areas are identified in aggregate, the determination is typically based on total local production, expressed in kilocalorie terms, compared to total local needs (also expressed in

kilocalorie terms). Estimated staple food needs are typically established by local governments and updated as consumption patterns change.

Surplus-producing area: A geographic area that produces sufficient quantity of a given commodity (or set of commodities, like cereals) to cover local demand and to supply other areas. An area can likewise be defined either as having a minor surplus, meaning that in a normal year slightly more of a commodity is produced than required to meet local needs, or as having a major surplus, meaning that production in a given area largely surpasses local needs.

Deficit area: A geographic area that does not produce enough of a given commodity to meet local demand.

Self-sufficient area: A geographic area that produces sufficient quantity of a commodity to cover local demand. This area rarely produces: either (1) enough to supply other areas, or (2) too little to meet local needs.

Market types

Reference market: A market that provides information about supply, demand, and price conditions in other nearby markets or key markets that influence the performance of others.

Collection market: A rural market where relatively smaller-scale traders (or trader agents) purchase directly from producers.

Assembly market: A market where relatively smaller quantities of a commodity are accumulated or aggregated, usually from different farmers and small-scale traders.

Wholesale market: A market where traders generally sell to traders. The volumes traded in each transaction tend to be relatively larger (for example, multiple 50-kg bags and even metric tons).

Retail market: A market where commodities are sold directly to consumers. The volumes traded during each transaction tend to be relatively small (for example, per kg or locally used bowl or other unit of measure).

Formal versus informal trade flows

Formal trade flows: Formal trade flows typically involve the exchange of large quantities of a given commodity, transported by road, rail, or sea. These trade flows are inspected, taxed, and reported in official government statistics, and abide by the requirements of the local legal system (including national-level laws and regional trade agreements). For example, in some countries, an importer or exporter is required to obtain a license from the local government or regional trade body that gives authority to engage in import or export activities. Formal trade can often also be thought of as legal trade.

Informal trade flows: Informal trade flows typically occur outside of the formal trade system (described above). These exchanges are typically not recorded in official government import and export statistics and are not inspected and taxed through official channels. These trade flows are typically undocumented, unlicensed, and unregistered. Informal trade flows can vary from very small quantities carried by bicycle across small border crossing areas or via barge in large volumes exchanged over long distances.

Trade flow magnitude and frequency

Large trade flows: The volumes traded (through either formal or informal channels) are estimated to be more important than other trade flow volumes in aggregate terms over the period of analysis. In unimodal FEWS NET countries, this represents the relative importance of trade flows between different geographic areas over a given

marketing year. In bimodal areas, these may be season-specific. Because it is not possible to estimate actual trade flow volumes between markets in most FEWS NET countries, these are estimated based on discussions with key informants familiar with the staple food market system of a given country or region.

Medium trade flows: The volumes traded (through either formal or informal channels) are estimated to be somewhere in between large and small flows in terms of the aggregate volumes traded over the period of analysis. These are estimated through the same process as large trade flows (above).

Small trade flows: The volumes traded (through either formal or informal channels) are estimated to be less important than other trade flow volumes in aggregate terms over the period of analysis. These are estimated through the same process as large trade flows (above).

Occasional trade flows: These trade flows either take place during very specific times of year (for example, in the lean season only) or when certain specific conditions present themselves. These are typically not as important (in aggregate quantity) as other more regular types of trade flows.

Price analysis

Coefficient of variation: One of many measures of price variability, this is computed by dividing the standard deviation of a given price series by the mean.

Average seasonal index: This is calculated to demonstrate the extent to which prices during a given month in a given place differ, on average, compared to prices during other months of the year.

Price differential: This refers to a spatial or temporal difference in prices (also see spatial and temporal/seasonal arbitrage).

Correlation coefficient: Measures the association between two variables. A value of 0 indicates no association and a value of 1 perfect positive association.

Freight on board (FOB): This term is the market value of goods at the point of uniform valuation (the customs frontier of the economy from which they are exported).

Cost insurance freight (CIF): This is the price of a good delivered at the frontier of the importing country, including any insurance and freight charges incurred to that point, and before the payment of any import duties or taxes.

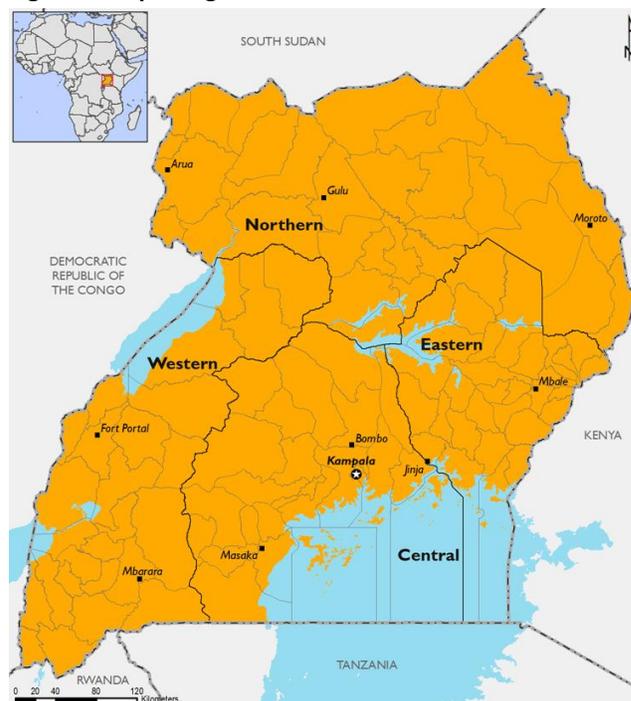
Export parity price (XPP): The monetary value of a product sold at a specific location in a foreign country, but valued from a specific location in the exporting country.

Import parity price (IPP): The monetary value of a unit of product bought from a foreign country, valued at a geographic location of interest in the importing country.

Executive Summary

- This FEWS NET Market Fundamentals report presents findings to inform regular market monitoring and analysis in Uganda. This report was prepared concurrently with an Enhanced Market Analysis (EMA) report, focusing on the Karamoja subregion of Uganda. Among other uses, the information presented jointly in these two reports can be used to support the design of food security programs, including but not limited to informing a U. S. Agency for International Development (USAID) Bellmon determination in advance of an FY 2017 USAID Community Development Fund-supported (CDF) development food assistance program in the Karamoja subregion.
- This report documents the basic staple food production and marketing context in Uganda, covering key commodities including maize, dry beans, cassava, cooking bananas (matooke), millet, sorghum, and edible oil. National livestock markets are also analyzed. The information presented stems from a literature review, secondary data, and a field assessment. In-country field research included structured, in-depth interviews with key stakeholders, market visits, and a two-day stakeholder consultation workshop held in Kampala in February, 2015.
- Over the past decade, Uganda made significant progress in economic and human development. Prudent macroeconomic policies and an inclusive development approach contributed to the revitalization of the economy, increased public and private investment in key sectors such as agriculture, education, and health, and a marked reduction in poverty (from 56 percent in 1992 to 19 percent in 2013 relative to the national poverty line) (MoFPED 2015).
- Agriculture is the backbone of the Ugandan economy. The agriculture sector employs 33 percent of the working population and contributes to 23 percent of national gross domestic product (GDP) (UBOS 2015). Favorable year-round climatic conditions and large agricultural potential facilitate the cultivation of a wide and diverse range of staple food and cash crops, as well as livestock production. A large proportion of agricultural households engage in both crop production and animal rearing (cattle, small ruminants, and/or poultry) (UBOS 2014). The fishery sector also plays an important role as an income generating activity, with Lake Victoria as the most important catchment area. Capture fishery (tilapia, carps, and other freshwater fish) dominates production since fish farming remains underdeveloped (Dalsgaard et al. 2012).
- Cooking bananas, cassava, dry beans, sweet potatoes, rice, millet, and sorghum are the main staple foods in Uganda, in terms of area planted and production volume (UBOS 2014; UBOS 2010). Coffee, tea, cotton, cut flowers, and processed fish are among the main agricultural products exported (MoFPED 2015). Maize is produced as both a staple food and cash crop and exported to regional markets.
- Uganda is self-sufficient in terms of staple food production, and plays a major role in regional food supply and trade. Staple foods are exported to neighboring structurally deficit countries (Kenya, South Sudan, and the Democratic Republic of the Congo (DRC)). Therefore, issues affecting the demand, supply, and/or trade of key

Figure 1 Map of Uganda



Source: FEWS NET.

staples in the broader region, influence market dynamics in Uganda. Regional economic integration through the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) facilitate trade flows.

- Most food production in Uganda takes place at the smallholder and subsistence level, under rainfed conditions, and with low use of agricultural inputs. The resulting productivity levels are generally low. The majority of the country benefits from two rainy seasons during the year (each with precipitation above 500 mm), allowing for two maize, beans, millet, and sorghum harvests. Seasonal production patterns for these crops plays a major role in availability and trade flows. Cassava, cooking bananas, and sweet potatoes are harvested and marketed throughout the year (FEWS NET 2010). Many of the northern districts of Uganda experience only one rainy season during the year and are prone to drought. Agricultural production in this area is more limited and consequently, the area is structurally-deficit and relies on supplies from surplus-producing areas of the country.
- Low output levels coupled with a high risk of pest/disease infestation, a weak market information system, limited market access, limited processing and value addition, poor postharvest management, and disregard for quality and phytosanitary standards constrain the performance of staple foods markets nationally and regionally (Chemonics 2010; MoFPED 2015). Several other factors influence the performance of agricultural markets through their impacts on food availability, access, and/or trade including (MoFPED 2015; FEWS NET 2015):
 - *Geographic/climatic*: occurrence of extreme weather events, particularly severe drought. As mentioned earlier, the bimodal rainfall pattern prevalent in most of the country ensures the viability of agricultural production throughout the year. The highest rainfall levels are observed in southern Uganda. Reduced rainfall compromises production particularly in the central, western, and northern regions (USGS 2012).
 - *Social*: conflict and insurgency, cattle rustling, increasing urbanization, widespread prevalence of HIV/AIDS, cholera, and malaria.
 - *Economic*: high poverty incidence, particularly in the Northern and Eastern regions conducive to low effective demand and growth of the middle class predominantly in the Central and Western regions leading to increased demand of certain food products.
 - *Physical*: insufficient and inadequate infrastructure (roads, irrigation systems, storage, cold chain), processing, and market facilities.
 - *Institutional*: financial support to the agriculture sector (public spending, extension services), market liberalization.
 - *Regional context*: seasonality of production and deficits in neighboring countries, participation of foreign traders in local marketing, regional economic integration efforts.
- In spite of the broad engagement of households in agriculture, only about a fourth of agricultural households rely on this sector as their only income source (MoFPED 2015). Most agricultural households source their food from a combination of own production and market purchases. Casual labor income is essential for covering basic food and nonfood needs of poor households, who rely on food purchases to a greater extent than wealthier households (FEWS NET 2010).
- Although Uganda is generally self-sufficient in terms of domestic food availability, the country does import limited volumes of wheat (and wheat products), vegetable oils, rice, and sugar destined for urban consumers and the food processing industry (FAO, n.d.; FAO 2003). Imports are sourced directly from international markets and through re-exports from international markets via neighboring countries. The port of Mombasa

in Kenya is the main access point for products imported to the EAC (World Bank 2010), although use of the port of Dar es Sallam is increasing.

- Most agricultural produce is sold by farmers at the farm gate or in local informal markets (AfDB 2014). Many actors participate along the marketing system, ranging from farmers, traders, central and local governments, to retailers and consumers (private and institutional). The most common pricing method for staple foods is bargaining during spot transactions between buyers and sellers, contributing to spatial and temporal price variation.
- Markets for locally-produced staple foods are generally competitive, with a large number of buyers and sellers. Constraints on the availability of capital needed for covering the different marketing costs (storage, transport, trading license fees) are among the most important barriers to entry (FEWS NET 2015). Traders rarely specialize in individual goods (food and nonfood) and rather switch across commodities depending on availability and profitability.
- The most important domestic markets are Kampala and Busia, both of which also serve as transit points for exports to regional markets. Soroti, Lira, and Gulu serve the structurally-deficit Karamoja subregion. Uganda is a net exporter of its staple foods and Kenya, South Sudan, Tanzania, DRC, and Rwanda are its main trade partners. Exports are seasonal and informal export volumes surpass those of formal trade.
- Thin markets, poor storage and processing facilities, and other infrastructure constraints, as well as multiple growing seasons in high-potential areas result in high intra-annual staple food price variation. Staple food demand is dynamic and very responsive to price changes, as consumers faced with higher prices for one good quickly shift demand to substitute products such as millet, sorghum, potatoes, yams, and peas.
- Commercial and humanitarian storage facilities are available in Uganda. The largest humanitarian warehouses are located in the greater Kampala area (capacity up to 18,000 MT per facility). In addition, a number of smaller facilities are scattered across the country with capacities between 350 and 3,000 MT. Most of these facilities are owned and operated by the World Food Programme (WFP) and have an aggregate capacity of about 50,000 MT. Commercial storage is available in the major cities and towns. The aggregate commercial capacity is around 85,000 MT. Public/government-owned storage is not available (Obita 2015). Karamoja has no large-scale storage and food assistance delivered there transits through humanitarian warehouses found elsewhere in the country (Soroti).

Overview of the main staple food markets

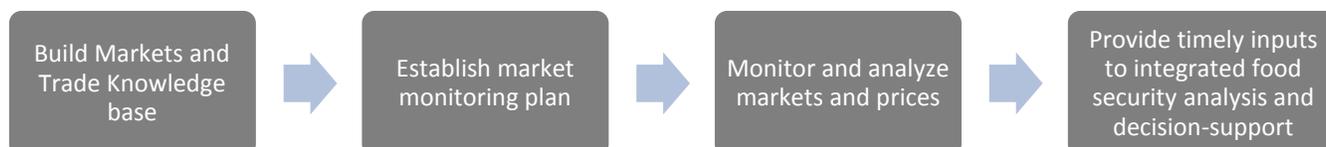
- *Cooking bananas*: Bananas are predominantly produced in the Western region. Traders typically collect bananas in plantations or in small assembly markets and transport them to their destination markets. A considerable amount of cooking bananas are exported informally to neighboring countries. Imports are dominated by the Gonja variety, which is typically roasted and sourced from the DRC and Tanzania.
- *Cassava*: Eastern and Northern Uganda contribute about two-thirds of total cassava production. Both leaves and tubers are eaten. The tuber is eaten fresh, dried, or processed into chips or flour, which is used to prepare porridges and bread. Its tolerance to drought and the possibility of harvest throughout the year make cassava an important food security crop. Estimations suggest that a significant amount of cassava chips and flour are informally imported into Uganda.
- *Maize*: White maize is produced in all four regions in Uganda, with the Eastern and Western regions contributing about 75 percent of national production. About 14 percent of total production (ca 400,000 MT) is exported to neighboring countries. Maize is consumed fresh or dried (grain, flour), and is also used for the local brewing and animal feed industries.

- *Dry Beans:* A wide variety of dry beans are produced predominantly in the Western and Northern regions of Uganda. Depending on the season, beans flow between Uganda and neighboring countries. Beans are cooked and served as a complement ("sauce") to other staples.
- *Millet and Sorghum:* Millet and sorghum production is marginal compared to that of other staples. Nonetheless, they are relevant crops particularly in the Eastern and Northern regions and are exported to South Sudan and Kenya via both formal and informal channels. These cereals are considered complementary to other staples and are used to produce bread, porridges, and beverages (alcoholic and nonalcoholic).

Preface

Markets and trade information and analysis are key inputs in FEWS NET’s integrated food security analysis. FEWS NET relies on a common understanding of a given population’s livelihoods (food and income sources and typical coping strategies used to handle shocks) as well as an understanding of typical market conditions and outcomes. Together, these are used to identify and quantify the magnitude of market-based anomalies and their potential impacts on food security outcomes of the poor and very poor (Figure 2).

Figure 2. FEWS NET’s approach to market monitoring and analysis



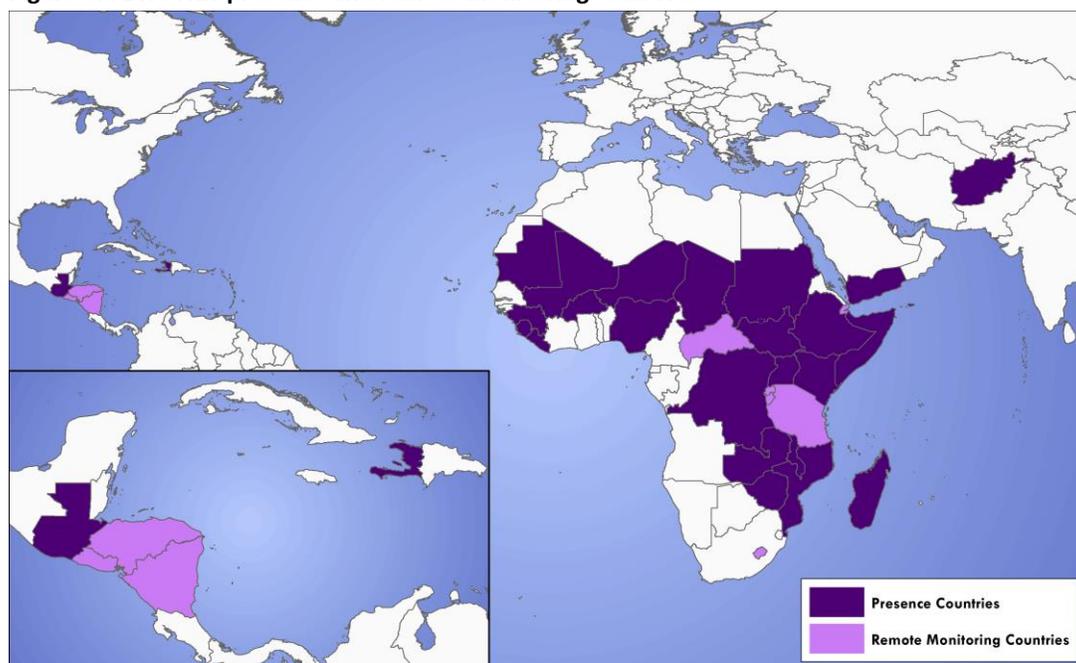
Source: FEWS NET (2014).

Several types of information help inform the understanding of typical market conditions that affect the food and income sources of the poor and very poor. These include: the geography of supply and demand for a particular commodity (for example, maize) or category of commodities (for example, staple foods); the role of different actors in the marketing system (from small-scale producers to industrial food processors); the seasonality of specific events or activities; aggregate import-dependence, particularly in the case of staple foods; and key programs and policies. These factors affect the stability of food availability and access (food prices and income levels) and therefore three of the four pillars of food security (food availability, access, utilization, and stability). Collectively, an understanding of these key elements constitutes the FEWS NET Markets and Trade Knowledge base.

Under FEWS NET III (FY 2012-2016), Markets and Trade Knowledge base information is compiled into “Market Fundamentals” reports that seek to provide readers with a general understanding of market dynamics during a typical year. These consolidated documents are elaborated for both presence and remote monitoring (RM) countries, with references to relevant external documents and resources when they are available. Two pilots were carried out in FY 2014, one in Sudan and one in Burkina Faso, to test the appropriateness of the approach, the usefulness of the end products, and the level of effort required.

During the first year of rollout (FY 2015), the Market Fundamentals reports will focus largely on staple food market structure and behavior. Such reports can be prepared for cash crop, livestock, and labor markets following a similar approach. Of particular interest to the FEWS NET project are markets identified as important sources of food and income for the poor and very poor based on an understanding of the livelihoods of those populations. The Markets and Trade Knowledge team’s vision is to eventually have a staple food Market Fundamentals report for each FEWS NET country and region. Other reports (focusing on cash crop, livestock, and labor markets) will be added in a modular fashion as time and resources permit.

FEWS NET monitors markets in presence as well as RM countries (Figure 3). A presence country is monitored by FEWS NET staff working in a local country office. RM countries are typically covered by analysts in a nearby country using a lighter analytical approach to identify anomalies and deteriorating conditions. FEWS NET also monitors staple food markets in other countries or regions that are relevant to understanding food availability and access for the poor and very poor in FEWS NET countries (for example, Benin, Pakistan, Kazakhstan, South Africa, and Mexico, among others).

Figure 3. FEWS NET presence and remote monitoring countries

Source: FEWS NET (2016).

The Market Fundamentals reports will continue to inform the project's regular market monitoring in terms of the commodities covered in the project's Markets and Trade database, Price Bulletins, Price Watch, and special reports (Figure 3). The specific markets and commodities covered in country-specific reports will depend on a number of factors. The reports focusing on staple food markets touch on the following:

- Cross-cutting issues that affect all markets in a given country or region: The political and macroeconomic environment and key national-level programs and policies that influence food and income sources.
- For each commodity market
 - Market structure, including the relative importance of local production versus imports in aggregate food availability and access, including the geographic distribution of production and consumption, and key actors in the marketing chain.
 - Market behavior/conduct, including purchase or selling behavior of key actors present in the marketing chain.
 - Market performance outcomes, including production trends, inter- and intra-annual price variability, and regional or international competitiveness.
 - Key indicators that analysts need to monitor over the course of the marketing year that could affect food availability and access of the poor and very poor.

FEWS NET's widely recognized production and trade flow maps are incorporated into the report for commodities produced and consumed both locally and regionally as a means of illustrating the relative importance of certain markets and trade flow patterns in assuring food availability and access throughout the country. However, when a commodity is grown almost entirely as an exported cash crop or imported almost exclusively from international markets, other relevant diagrams and illustrations are used.

1. Uganda Staple Food Market Fundamentals

1.1 Introduction

In recent years, Uganda has made significant progress in economic and human development. The Government of Uganda's implementation of prudent macroeconomic and trade policies has contributed to macroeconomic stability, improvement of government finances, revitalization of the economy and economic growth, increased public and private investment in key sectors such as agriculture, education, and health, and a marked reduction in poverty (MoFPED 2015).

Agriculture is considered the backbone of the Ugandan economy. The agriculture sector employs about 33 percent of the working population and contributes to about 23 percent of GDP (MoFPED 2015; UBOS 2015). However, rapid growth in other sectors of the economy, such as industry and services, provides evidence of the structural transformation underway since the early 2000s (MoFPED 2015). Thus, while agriculture remains key, other sectors are emerging and gaining relevance in the country's economic performance. On aggregate, Uganda is self-sufficient in terms of their domestic food availability and demand, with the exception of edible oil for which imports constitute a large share of total availability (Table 1).

1.2 National food supply

Uganda's favorable year-round climatic conditions and large agricultural potential facilitate the cultivation of diverse staple food and cash crops, as well as livestock production. Maize, cooking bananas (matooke), cassava, beans, sweet potatoes, rice, millet, and sorghum are the main food staples in the country in terms of area planted and production volume (UBOS 2010b) (UBOS 2014a). Higher-value commodities such as coffee, tea, and cotton are also produced and are among Uganda's main agricultural exports (MoFPED 2015). Livestock production is predominantly of cattle, sheep, and goats, with farming households typically engaging in both crop production and animal rearing. Fisheries are also relevant in the national context, both as source of food and income, with Lake Victoria standing as the most important catchment area. Capture fishery (tilapia, carps, and other freshwater fish) dominates production since fish farming remains underdeveloped (Dalsgaard et al. 2012).

Table 1 Commodity balance (MT), Uganda, 2010-2014 average

Source	Bananas	Cassava	Maize	Beans	Millet	Sorghum	Edible oil
Production	4,569,800	2,865,600	2,655,000	937,200	246,600	352,400	150,400
Losses	854,553	573,120	531,000	140,580	37,976	44,755	N/A
Loss rate (%)	19%	20%	20%	15%	15%	13%	N/A
Imports	265	450	3,092	7,696	24	17,706	207,648
Total Supply	3,715,513	2,292,930	2,127,092	804,316	208,647	325,352	358,048
Domestic requirements	3,714,370	2,284,321	1,896,358	684,733	244,985	133,402	324,010
Exports	1,142	8,609	761,734	260,163	1,639	236,704	34,038
Total Demand	3,715,513	2,292,930	2,658,092	944,896	246,624	370,106	358,048
Domestic balance	877	8,159	758,642	252,467	1,615	218,998	-173,610

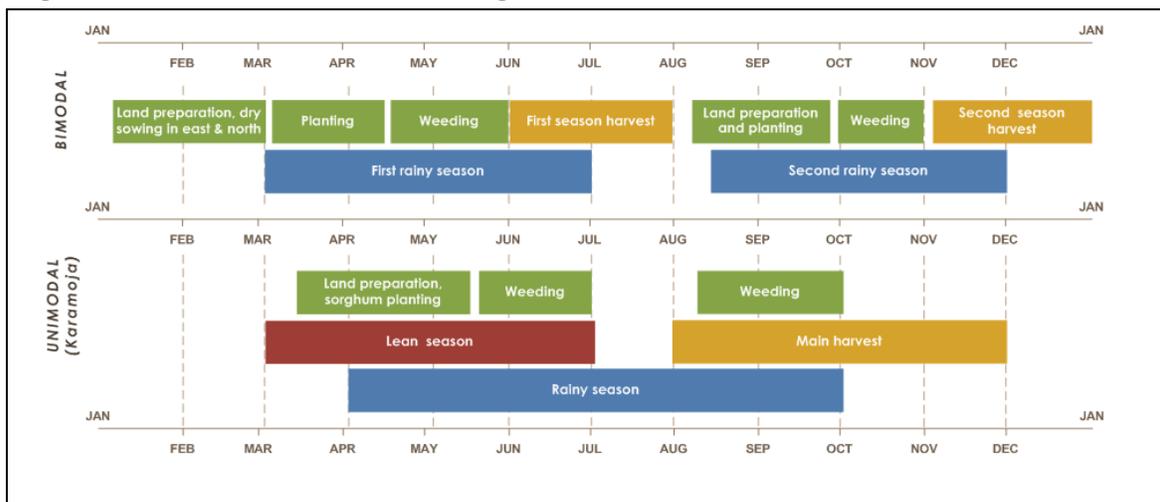
Note: Banana and cassava estimates are based on the reported volume of fresh bananas and tubers harvested and traded. The reported volumes were not adjusted to grain or dry weight equivalent.

Source: Authors' calculations based on data from UBOS (2015), COMTRADE, FAOSTAT, and FEWS NET (2016).

Most food production in Uganda takes place at the smallholder and subsistence level, with low use of agricultural inputs, and in rainfed conditions. Generally, agricultural productivity levels are low. Declining soil fertility and low use of external inputs such as fertilizer, herbicide, and pesticide are frequently identified as major causes for stagnant and even declining yields. Only about 2 percent of smallholder farmers use any kind of external inputs

(Nkonya 2001). The availability of two rainy seasons (bimodal rain pattern) in most part of the country allows for two cropping seasons for maize, beans, millet, and sorghum (Figure 4). For these crops, seasonality plays a major role in food availability and trade. Other staples such as cassava, cooking bananas, and sweet potatoes are harvested and marketed throughout the year. The decision to harvest depends on stocks, price level, and household food needs.

Figure 4. FEWS NET seasonal calendar for Uganda



Source: FEWS NET (2010).

The unimodal rainfall pattern in northern Uganda (Karamoja) translates in one single harvesting period between August and December. In the bimodal areas, planting for the first season preparation starts in March, with harvests occurring between June and August. Planting for the second season takes place during August and September, with harvests occurring between November and December (FEWS NET 2015). While rainfall takes place over a shorter period during the second season, there are, on aggregate, no major differences in total yield between the two seasons for many crops (FEWS NET 2010).

1.3 National food demand

The Ugandan diet is based heavily on cooking bananas, tubers (mainly cassava and sweet potatoes), grains (maize, millet, and sorghum), and beans (Table 2). These main staples provide about three-quarters of calories consumed (IFPRI 2008; FAO, n.d.). Imports are limited and occur based on seasonality of production and for products such as wheat (and wheat products), rice, and sugar, which are predominantly demanded by urban consumers and the food processing industry (FAO 2003). Uganda exports considerable volumes of maize, beans, and sorghum. Trade includes both formal

Table 2 Calorie composition of the Ugandan diet

	Calorie composition of diet (% of total)	Consumption from Household production (%)
Tubers, potatoes	22.6	71.2
Cooking bananas	18.9	76
Maize	16.1	36.2
Pulses	13.1	50.6
Millet & sorghum	4.2	70.6
Sugar	4.2	0.5
Oil	3.5	2.4
Other	3	7.8
Dairy	2.7	44
Rice	2.6	7.6
Fish	2.5	4.1
Fruit & vegetables	2.5	43.2
Meat & eggs	2.1	13.1
Drinks	1.1	16
Bread	1	1.1

Source: Author's calculations based on data from IFPRI (2008).

and informal transactions. “Edible oil” in the context of Uganda includes coconut oil, cotton oil, maize oil, palm oil, sesame oil, soybean oil and sunflower oil.

As in other East African countries, most Ugandan households are net buyers of food. While agricultural households source their food from a combination of own production and market purchases, over 66 percent of Ugandan households rely on market purchases for a large proportion of the food they consume (IFPRI 2008). The availability of different staple foods facilitates households’ sustained access to food and resilience to commodity-specific shocks (high prices, crop failure, etc.) (IFPRI 2008). Depending on production and market conditions as well as personal preferences, households select the staples to be consumed within the household. Staple food demand in Uganda is considered dynamic and very responsive to price changes. When consumers face lower availability or high prices in their preferred staples, they easily substitute.

In spite of the broad engagement in agriculture, only about a fourth of agricultural households rely on the agriculture sector as their only income source. The majority of households supplement agricultural income with other income sources (MoFPED 2015). For poorer households, casual labor income is essential for covering basic food and nonfood needs. These households tend to rely on food purchases to a greater extent than wealthier households. Food assistance is common in Uganda, especially for areas affected by conflict and other natural disasters, as well as for refugee and internally displaced populations (IDP) (see Chapter 2). The Karamoja subregion is the most food insecure area of Uganda and has been an ongoing focus of international food assistance efforts.

1.4 National food trade

Most agricultural produce is sold by farmers at the farm gate or directly in local informal markets (AfDB 2014). Many actors participate in the marketing system including farmers, traders, central and local governments, processors, and retailers and consumers (private and institutional). The most common pricing method for staple foods is bargaining between buyers and sellers. Producers tend to participate more in the market in the first season than in the second season. The longer dry period of the second season leads households to keep a larger share of their production to satisfy their own consumption needs (Adong, Muhumuza, and Mbowa 2014). Participation in markets is further influenced by the level of access to feeder roads. The most important domestic market is Kampala. Markets located in the districts of Arua, Mbarara, Gulu, Lira, Masindi, and Soroti also serve as transit points for many destinations within the country and the broader region.

Local staple food markets are generally competitive, with a large number of buyers and sellers. Barriers to entry mainly relate to the availability of capital needed for covering the different marketing costs (storage, transport, trading license fees, etc.) (FEWS NET 2015). Traders rarely specialize in individual goods (food and nonfood) and switch across commodities depending on availability and profitability. With the exception of livestock (cattle), there are no cultural barriers prevent women from participating in the marketing system. Cattle trade is predominantly in hands of men (FEWS NET 2015). Institutional buyers such as the World Food Programme (WFP), the Ministry of Defense, prisons, the Prime Minister’s Office, the police, and schools are important buyers for staples such as maize and beans (Kilimo Trust 2012).

The staple marketing system in Uganda faces several constraints, namely: limited participation of input traders, information asymmetries between traders and producers, lack of contracting schemes between buyers and sellers, disregard for standardization and product grading based on quality, high transaction costs, high postharvest losses, limited access to financial services, limited availability of storage infrastructure, and limited processing and value addition (Chemonics 2010). Poor storage and processing facilities, general infrastructure constraints, and the seasonality of harvests result in inter and intra-annual price variation for most locally produced commodities.

1.5 Regional food trade

Uganda plays a major role in regional food supply and trade. Staple foods are regularly exported to neighboring structurally deficit countries and to other countries in the region. Kenya, South Sudan, Tanzania, Democratic Republic of the Congo (DRC), and Rwanda are Uganda's main trading partners. Kenya is the main importer of Ugandan food (IFPRI 2008). Trade with these countries occurs through both formal and informal channels (Table 3), but the estimated size of informal exports surpass that of formal exports (UBOS 2014b).

A wide range of factors within the East African regional context have direct implications for trade dynamics and the performance of Uganda's staple food markets. For instance, macroeconomic and social factors such as currency depreciation, diminishing export revenues, and conflict/social unrest constrain countries' capacity to import (for example, South Sudan). The existence of regional trade agreements and policies facilitate the entry of Ugandan products into the region and influence domestic production and trade dynamics in Uganda. Lastly, seasonality in production has clear implications on trade dynamics (IFPRI 2008).

The markets of Katuna in Rwanda, Busia in Kenya, Mutukula in Tanzania, and Juba in South Sudan are key regional entry markets for Ugandan exports (IFPRI 2008). The relatively limited volumes of imported commodities are sourced from neighboring countries (re-exported from international markets) as well as directly from the United States and Europe. The port of Mombasa in Kenya is the main access point of imported products into the East African Community (EAC) (World Bank 2010).

Table 3 Informal cross-border trade, Uganda, 2010-2013

Product	Informal exports (US\$ Million)				Informal imports (US\$ Million)			
	2010	2011	2012	2013	2010	2011	2012	2013
Maize grains	28.6	15.6	44.1	36.9	-	-	-	-
Beans	20.5	21.2	22	19.3	3.6	3.3	3.5	2.1
Bananas	8.1	4.6	6.1	5	2.8	2.8	2.2	2
Sorghum grains	3	2.1	6.2	3	0.3	0.2	1	0.2
Millet grains	5.9	3.9	2.3	2.8	0.1	0.1	0.1	0.2
Cassava	2.1	1.6	1.1	1.8	0.9	1	0.9	0.3
Rice	-	-	-	-	3.9	3	5.3	8.3
Cooking oil	-	-	-	-	3.9	2.8	3.2	3.3
Cattle	16.9	10.4	17	16.3	-	-	-	-
Goats	2.1	3.3	6.4	7	-	-	-	-
Sheep	1.1	1	1.8	2.2	-	-	-	-

Source: Author's calculations based on data from UBOS (2014b).

A number of nontariff barriers to trade affect trade between Uganda and the region. The most common barriers include limited testing and certification arrangements with respect to sanitary and phytosanitary requirements; large documentation requirements and complex formalities needed to clear customs; a lack of harmonized grades and standards; roadblocks; inadequate infrastructure; and unstandardized weighbridges (Okumu and Nyankori 2010). Trade beyond the East African region is further complicated by high transport costs, communication barriers, and Uganda's landlocked position (IFPRI 2008) and Uganda's staple markets are relatively isolated from global markets. Key staples such as cassava, cooking banana, sorghum, and millet are only regionally traded. Even Ugandan maize markets are not well integrated with global markets (MAFAP 2013).

2. Cross-cutting Issues

A number of ongoing and cross-cutting issues affect nearly all aspects of the Ugandan economy, including staple food marketing systems.

2.1 Geography and agro-climatology context

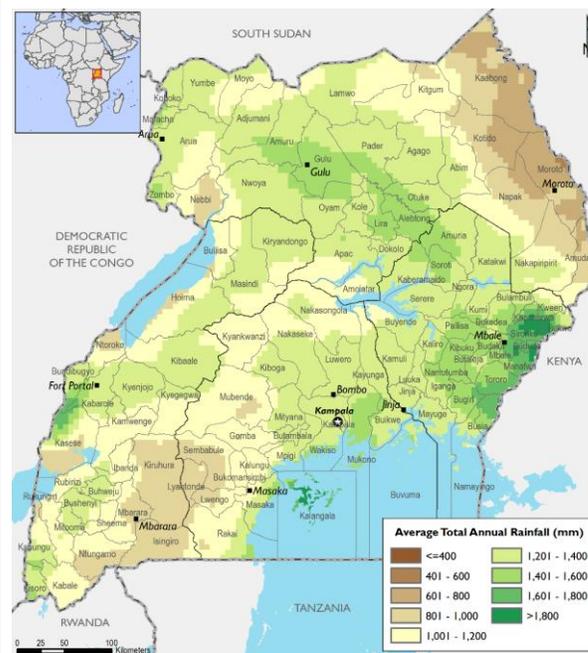
Agro-climatic conditions are generally favorable for agricultural production in Uganda. As indicated in Chapter 1, a bimodal rainfall pattern allows two cropping seasons (and harvests) for a variety of crops. During the first rainy season, rainfall occurs from March until July. The second rainy season extends from mid-August until December. Rainfall levels vary by location, with the highest levels recorded in Central and Eastern Uganda (Figure 5). Significantly lower rainfall levels occur in the unimodal area located in the northeast part of the country, specifically in the Karamoja subregion (which includes the districts of Kaabong, Kotido, Abim, Moroto, Napak, Nakapiripirit, and Amudat). Contrary to the rest of Uganda, this part of the country has a drier climate and only one main rainy season, which extends from April through September. This area is more suitable for pasture and areas for cattle rather than productive agricultural land.

The bimodal rainfall pattern prevalent in most of the country ensures the viability of agricultural production throughout the year. However, periodic droughts are common and sometimes severe, particularly in the Central, Western, and Northern regions (USGS 2012). The Karamoja subregion is particularly drought-prone and has experienced frequent droughts due to erratic climate. For instance, in 2006 and 2009, lower than normal and poorly distributed rains led to reduced crop yields, pasture, and livestock production in the three consecutive agricultural seasons (WFP and UBOS 2013).

Uganda's "cattle corridor" (see Livestock chapter, Figure 44) is a stretch of drylands that runs from the northeast of the country to the southwest, covering more than a dozen districts (Stark 2011). Because of the drier conditions that persist in this area, land is commonly used by pastoralists since it is better suited for cattle grazing than for agriculture.

Climate change effects have been observed in Uganda over the past 25 years, with decreased rains and higher temperatures across the country promoting a drier climate. According to United States Geological Survey analyses (USGS 2012), the size of the areas registering precipitation of 500 mm (and higher) in each rainy season during the 1960–1989 period decreased during 1990–2009 and are forecast to become even smaller in the future. In addition, air temperature increased around 0.2 degrees Celsius per decade across most of Uganda between 1960 and 2009. These climatic changes especially affect the already relatively dry areas and the cattle corridor and will certainly affect overall crop and pasture production.

Figure 5. Rainfall map of Uganda



Source: Author's calculations based on data from USGS (2016).

2.2 Economic context

2.2.1 Structure of the economy

Uganda's economy grew at a relatively fast rate in recent years (Figure 6). Between 2000 and 2014, national gross domestic product (GDP) grew at an average of 6.6 percent per year (MoFPED 2015).

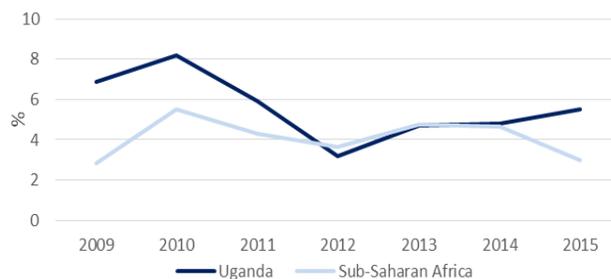
The service sector contributes the most to GDP (45 percent) (Figure 7). Agriculture, while no longer the major contributor to GDP, still employs a large share of the population in Uganda (33 percent of the population; UBOS 2015).

Since the late 1980s, the Ugandan government has pursued pro-market reforms and policies to ensure macroeconomic stability that has led to sustained growth and lower economic volatility (World Bank 2016). In recent years, the economy was driven by growth in the service sector, namely telecommunications, transport, and financial services. In 2012, a number of external and domestic factors slowed the rate of growth of the economy, but the economy is still growing at or higher than the average in Africa south of the Sahara (World Bank and MoFPED 2015). The service sector is the main engine of growth. With respect to agriculture, its contribution to overall growth has been minimal as the sector has grown slowly (2 percent per year from 2011 to 2013). However, agroprocessing (especially fish and meat) has expanded rapidly (World Bank and MoFPED 2015).

With respect to external trade, coffee, petroleum products, fish, and fish products are the main exports by value. Figure 8 presents the value of exports in 2014. Noticeably, coffee exports are a major element on international trade. The main markets for Ugandan exports are South Sudan, Kenya, and DRC, which accounted for 41.5 percent of exports by value in 2014 (UBOS 2015). Imports predominantly come from Asia, with imports from India, China, and Japan accounting for 42 percent of total imports by value in 2014 (UBOS 2015).

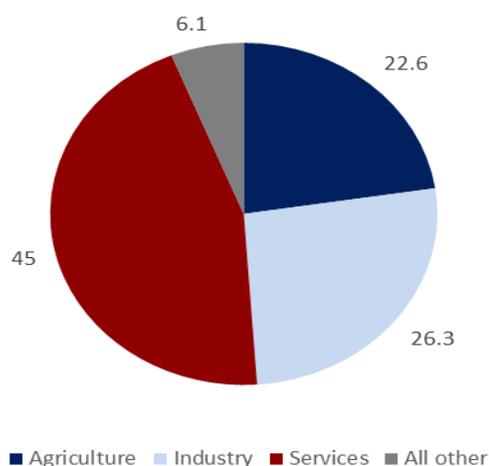
Following the plans associated with the National Oil and Gas Policy from 2008, major growth in the sector is expected upon completion of substantial infrastructure

Figure 6 GDP growth rate, Uganda Sub-Saharan Africa, 2009-2015



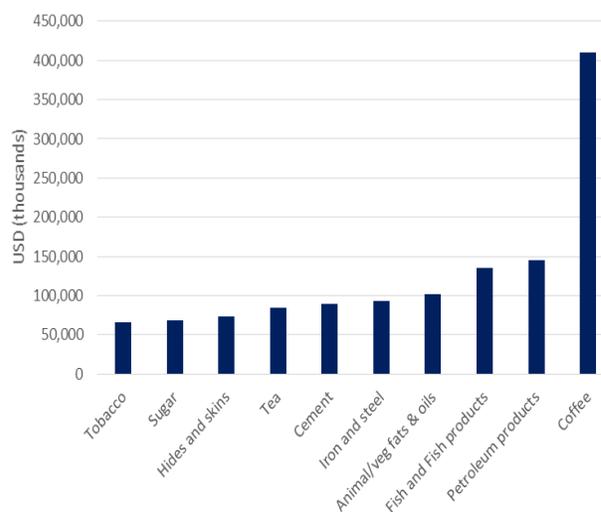
Source: Author's calculations based on data from UBOS (2016); World Bank (2016).

Figure 7. Share of GDP by sector, Uganda, 2013



Source: Author's calculations based on data from UBOS (2015).

Figure 8 Exports by value, Uganda, 2014



Source: Author's calculations based on data from UBOS (2015).

investments (including a refinery and a pipeline through Tanzania for oil exports) in the coming years. In the long term, the Government of Uganda's aim is that oil exports will represent an increasing share of total exports and will become a key source of public resources that will be reinvested in education, healthcare, and infrastructure (MEMD 2008; World Bank and MoFPED 2015).

In 2011, the Ugandan government conducted a census of business establishments, which was a full enumeration of "all operating economic units with a fixed location in the country, irrespective of the number of employees" (UBOS 2011, page 19). The Central region including Kampala accounts for about 60 percent of all businesses, formal and informal, nationwide (Table 4). The largest proportion of employees are located in Kampala and the Central region. The Northern region hosts only 8 percent of all businesses in the country (UBOS 2011).

Table 4 Proportion of businesses by sector and region (%), Uganda, 2011

Sector	Kampala	Central	Eastern	Northern	Western	Total
Agriculture	4.4	39	39.2	2.9	14.5	100
Mining and quarrying	17.1	27.1	14.4	0.6	40.8	100
Manufacturing	32.3	26.8	15.4	8.3	17.2	100
Utilities (electricity, gas, water)	32	25	12	8	23	100
Construction	74.7	8.4	5.4	5.1	6.4	100
Trade	29	29.3	14.6	8.9	18.2	100
Transport and storage	41.8	26.7	11.2	13.4	6.9	100
Accommodation and food services	26.5	31.6	13.6	7.7	20.6	100
Information and communications	35.2	30.1	16.6	6.1	12	100
Financial intermediation and insurance services	27.7	20.2	16.2	11.5	24.4	100
Real estate and business services	47.5	24	9.6	5.4	13.5	100
Health and social works	28.8	32.5	13.9	8.5	16.3	100
Recreation and personal services	31.2	35	12	5.5	16.3	100
Education	25.5	30.9	15	12.1	16.5	100

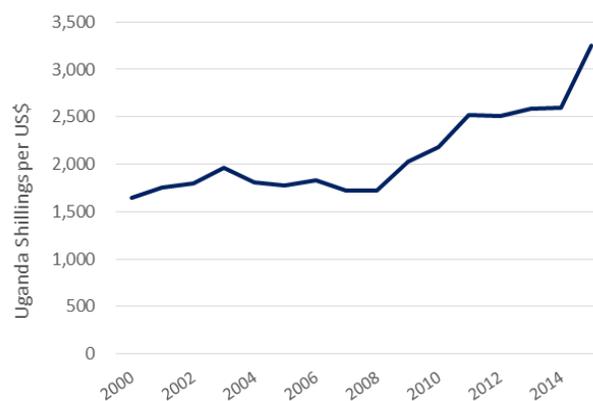
Source: Author's calculations based on data from UBOS (2011).

2.2.2 Exchange rate trends

Since 2008 the Uganda shilling has continuously depreciated against the US dollar (Figure 9). The most recent depreciations (2015–2016) are associated with the strengthening of the US dollar, increased demand for foreign exchange for public infrastructure projects, and decreased exports (MoFPED 2016).

The currency depreciation has impacted both imports and exports of goods and services. In terms of trade with key buyers of Ugandan food staples, trade with Kenya has been less affected given the use of local currencies in the transactions. Trade with South Sudan decreased considerably during 2015 and early 2016 due to several factors including adverse macroeconomic conditions, trade constraints posed

Figure 9 Exchange rate, Uganda, 2000 – 2015



Source: Author's calculations based on data from Bank of Uganda (2016).

by high transaction costs, decreased resources available from oil due to falling global oil prices, conflict and insecurity, reduced purchasing power experienced in that country, and reliance on the US dollar for these transactions (FEWS NET 2015; FEWS NET, FAO, and WFP 2016).

2.2.3 Trade agreements and institutions

The existence of regional trade agreements (such as the EAC and COMESA and the existence of international relief efforts in the broader region facilitate the access of Ugandan food staples into the regional market. Table 5 provides an overview of the different trade schemes on which Uganda participates. Ugandan staple foods are exported to neighboring structurally deficit countries (Kenya, South Sudan, and DRC), making Uganda a key actor in regional trade dynamics and food security. Thanks to membership in the EAC and COMESA, Ugandan products benefit from reduced trade barriers among member countries within the region (EAC 2014).

Table 5 Trade agreements, Uganda

Organization/country	Major policies	Members
WTO	Member of African Group, the African, Caribbean and Pacific Group of States, and the Least-Developed Countries Group	Global
East African Community (EAC)	Free trade zone between EAC countries with Common External Tariff (CET) of: 25%: beans, cassava, sweet potatoes, sorghum, and millet 37.5%: maize	Kenya, Tanzania, Burundi, Rwanda, Uganda
Common Market for Eastern and Southern Africa (COMESA)	Preferential tariff on imports from non-EAC COMESA member states. EAC CET 25% = COMESA 6% EAC CET 10% = COMESA 4% EAC CET 0% = COMESA 0%	Kenya, Burundi, Rwanda, Uganda, Comoros, DRC, Djibouti, Egypt, Eritrea, Ethiopia, Libya, Madagascar, Malawi, Mauritius, Seychelles, Sudan, Swaziland, Zambia, Zimbabwe
US	Eligible for duty free exports to US through United States African Growth and Opportunity Act	US and Uganda
EU	Eligible for duty free exports to EU through Everything-but-Arms (EBA) initiative of the European Union	EU and Uganda

Source: WTO (2012).

Uganda's status as a net exporter of food enables the country to act as a source of local and regional procurement of food assistance, both for use in Uganda and for the region. Indeed, food assistance has changed the market dynamics of some products (mostly maize) as the government and WFP make local purchases of commodities for their use as food assistance. According to a recent study, about 12.5 percent of marketed maize surplus in Uganda was purchased by WFP in the 2001–2011 period. About 30 percent of that food was exported to other countries for food assistance. For in-country assistance, the large majority of locally distributed food aid (average of 97 percent) was sourced within the country. Over time WFP has introduced quality requirements for its purchases and promoted a more formal sourcing approach with its sellers. Given its position as the largest single buyer of quality maize, WFP has driven changes in maize production and management practices in Uganda (Tschirley, Myers, and Zavale 2013). In sum, both regional trade and food assistance influence production and trade dynamics in Uganda.

2.2.4 Infrastructure

Infrastructure is being developed in Uganda, but currently does not meet the needs of the growing economy. With limited rail and air transportation, roads carry 95 percent of passenger and freight traffic (Obita 2015). Figure 10 provides an overview of road availability, differentiating between highway, primary, and secondary roads. Only 19 percent of the national road network is paved. Access to feeder roads is also inadequate in many rural areas,

affecting agricultural producers' ability to transport their products (MoFPED 2015). Uganda is landlocked and relies on Kenya (the port of Mombasa) and Tanzania (port of Dar es Salaam), which are 1,100 and 1,600 km from Kampala, respectively, for accessing port infrastructure for international trade, making road transportation all the more important.

In addition, only 14 percent of rural households have access to electricity, further constraining the production and marketing of goods (Coronel 2015). Commercial storage facilities are generally available in Kampala and in major towns but in short supply in remote towns and villages (Obita 2015). The government reportedly has plans to spend US\$11 billion on an extensive overhaul of transportation and electricity networks over the next 10 years (Coronel 2015).

2.3 Social context

2.3.1 Population

In 2014 the population in Uganda totaled 34.6 million inhabitants (UBOS 2016). Population growth, increasing urbanization, and growth of the middle class suggest that the number of persons fully dependent on the market for accessing food will increase in the future. Another social factor that impacts the staple foods marketing system is the incidence of HIV/AIDS and other diseases, which reduce labor availability for agricultural production (FEWS NET 2015).

Between 1992 and 2013, Uganda witnessed an improvement in the living conditions of the population. During this period, poverty fell from 56 percent to 19 percent relative to the national poverty line. An estimated 37 percent of the total population is considered to be in the middle class (MoFPED 2015). In spite of these improvements, wide geographic variations in poverty rates persist, with the Northern region having a disproportionately high amount of poverty relative to the other regions (Table 6).

The Government of Uganda, through different ministries, the Uganda Bureau of Statistics (UBOS), and in collaboration with other partners (World Bank, USAID, Measure DHS, Makerere University, etc.), monitors the population's development in a variety of sectors (education, health, economy) through diverse surveys such as the Demographic and Health Survey, the Child Labour Survey, the Employment and Earning Survey, the Migration Household Survey, and the National Household Survey. The most recent National Household Survey was carried out in 2012/13 and adds information to four other similar surveys carried out between 1999 and 2010.

Figure 10 Road network in Uganda



Source: Author's calculations based on data from OpenStreetMap (2016).

Table 6 Poverty estimates by region, Uganda, 2012/13

Region	Share of population (%)	Poverty estimates (% of population)
Central	25.8	4.7
Eastern	29.7	24.5
Northern	21.1	43.7
Western	23.5	8.7

Source: Author's calculations based on data from UBOS (2015).

2.3.2 Local and regional conflict, civil unrest, and displacement

During the 1990s, major civil conflict in the northern region of the country resulted in the displacement of about 1.8 million people. Cessation of the conflict in 2006 brought relative stability to the Northern region, where the impacts were most severe (Figure 11). However, the prolonged conflict, among other factors, caused this area of the country to lag behind in terms of development (MoFPED 2015; UNDP 2015). Recovery efforts in this region were initiated in 2007 through the government's Peace, Recovery and Development Plan. Within the more stable environment, households initiated or increased production of staple food crops. Surplus production is increasingly being marketed in Gulu, Lira, Pader, and Kitgum districts (FEWS NET 2015).

Due to the conflict and other disasters afflicting the country (such as Ebola outbreaks in 2001 and 2008, severe flooding, drought, mudslides, and food insecurity in the northeastern area of the country), Uganda has received substantial humanitarian assistance. In recent years and upon the end of the conflict, a large proportion of aid transitioned from emergency/humanitarian response toward recovery and development support (USAID 2009).

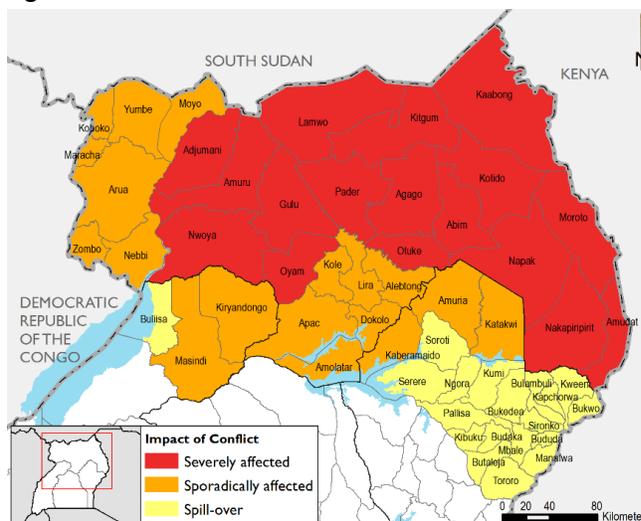
Instability in neighboring countries also affects the Ugandan food marketing system. In addition to impacts on trade flows between the countries (particularly trade from small- and medium-scale informal traders), the large numbers of refugees arriving to Uganda create additional demand for a variety of food and nonfood products in certain localized areas of the country. Recent estimates indicate that as of July 2016 a total of 568,414 registered refugees and asylum-seekers were living in Uganda. A large proportion of them come from DRC (38 percent) and South Sudan (42 percent). While DRC refugees tend to settle in the central and western regions, South Sudanese refugees and asylum-seekers remain in the northern region (UNHCR 2016).

2.4 Political and institutional context

2.4.1 Policies affecting the staple foods marketing system

The Ugandan government has established a number of agricultural development policies and related interventions that affect food availability and access. These initiatives address the issues input supply, production and postharvest management, product quality and food safety, and trade and value addition (Table 7). Of the many initiatives underway, two stand out. The first is the Agricultural Sector Development Strategy and Investment Plan (2011–2015), which outlines investment areas to promote market-led growth in the agriculture sector as a way of reducing poverty in Uganda. It focuses on four areas: enhancing production and productivity; increasing market access and value addition; improving the enabling environment; and institutional strengthening in the sector. The second is the 2013 National Agricultural Policy. Its objective is to promote food and nutrition security and household income through actions that will support productivity, value addition, employment creation, agribusiness growth, and trade (MAAIF 2013).

Figure 11 Map of conflict-affected areas in Northern Uganda



Source: UNDP (2015)

Table 7 National policies affecting food availability and access

General	Quality Standards and Food Safety
Liberalization and privatization (ongoing) Regional integration (East African Community) (2000) Comprehensive Africa Agriculture Development Program (2003) The Land (Amendment) Act (2009) National Co-Operative Policy (2011)	Agricultural Chemicals Control Act (2006) Food and Drugs Act (1964) Food Quality Assurance Rules (1998) The Uganda National Bureau Of Standards Act (1983) Public Health Act, Chapter 281 of the Laws of Uganda (2000) Uganda National Council for Science and Technology Act (1991)
Agricultural inputs	Trade and value addition
National Seed Policy (2014) National Fertilizer Policy (2016) National Biotechnology Bill (2012) Plant Protection and Health Act (2013)	National Trade Policy (2007) (NTS) National Standards and Quality Policy (2012) The National Industrial Policy (2008)
Production and Post-Harvest	Other policies
Plan for Modernization of Agriculture (2000) National Development Plan (2010) Agricultural Rural Development Strategy (2005) National Agricultural Policy (2013) Agricultural Sector Development Strategy and Investment Plan (2010-2015)	National Information and Communication Technology Policy (2012) Uganda Energy policy (2002) Monetary policy (2011) Fiscal Policy (annual)

Source: FEWS NET (2015).

2.4.2 Decentralization challenges

In 1992 the Ugandan government launched decentralization reforms that aimed to transfer political, administrative, and financial power from the central government to local governments. This decentralization allowed (and mandated) local governments to set up development plans based on local priorities, to appoint and manage staff needed for delivering services, and to raise revenues and manage budget. The local government structure is composed of five layers, from lower village level councils up to district councils. The lower levels of government have defined functions, status, and autonomy with respect to the upper district level. To ensure public service delivery at the local level, local governments are entitled to collect taxes and fees (Steiner 2006).

Generally, local governments align to central/national level development priorities and plans, and also benefit from central transfers (grants) that aim to cover issues of national priority. As well, the central government maintains responsibility in the area of defense, security, foreign relations, guidelines for sectoral policy making, and other national public goods (Steiner 2006; Ojambo 2012).

The decentralization process is considered to have achieved mixed results. While on one hand local governments focus more on issues relevant to their constituencies and priorities, the extent and quality of service delivery, as well as the generation of fiscal resources, remain a challenge (Steiner 2006). The reform resulted in establishment of a large number of district-based structures/agencies, which can pose difficulties for commodity production and trade flows (FEWS NET 2015).

For instance, local governments are responsible for providing agricultural services and implementing activities against soil erosion (Steiner 2006). Taxes and other fees are collected in districts through which a product passes (FEWS NET 2015). A recent study found that transit costs, municipal permits, council permits, road toll stations, and licenses accounted for 43 percent of the total transfer costs for maize from Uganda toward EAC neighbors (Karugia et al. 2009).

3. Cooking bananas (Matooke)

Bananas are considered the main staple food in Uganda. Banana production (all varieties) ranks first in terms of production volume and second in terms of cultivated area. Cooking bananas are by far the most widely consumed type of bananas (Abodi et al. 2007). Most of the banana output is consumed on the domestic market since the high degree of perishability and difficult transport conditions pose major challenges in the banana trade. Nonetheless, bananas are regularly exchanged in the regional markets (FEWS NET 2015).

3.1 Consumption

Bananas are considered the main staple food and a key food security crop in Uganda. Uganda registers the highest per capita annual consumption of bananas in the world, with estimates in the literature indicating consumption levels of about 0.4 – 0.7kg per capita per day (140-255 kg per year). Overall, bananas contribute to approximately 30 percent of daily caloric intake (Haggblade and Dewina 2010; Abodi et al. 2007). While sweet bananas are widely consumed, cooking bananas are by far the most produced and consumed banana type in the country. As the name suggests, they are consumed predominantly as cooked fresh bananas. The fruits are typically steamed and mashed and served as a staple dish. The leaves are further utilized for cooking and steaming and for the creation of ropes and crafts. The pseudo-stems provide fodder for animals (Abodi et al. 2007).

3.2 Production

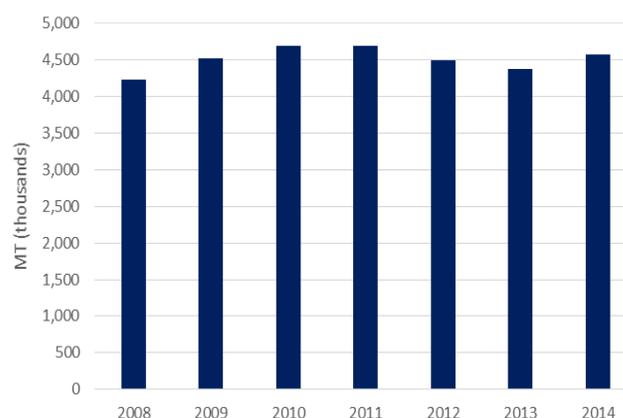
Aggregate banana production ranks number one in Uganda in terms of production volume and second in terms of cultivated area. Production levels remained fairly stable in past years, with average production of 4.5 million MT per year, cultivated on about 1 million hectares (Figure 12) (UBOS 2015). Bananas are produced countrywide, but the Western and Central regions generate close to 80 percent of national production (Table 8).

According to their use, bananas are classified into three types:

- Cooking bananas (matooke, or green bananas/plantains), which are used for food and constitute about 93 percent of total production;
- Beer bananas, which represent about 6 percent of total production; and
- Sweet bananas, which represent about 1 percent of total production.

As with many other crops, cooking bananas are produced by smallholders and follow a traditional production system, with low use of external inputs. Endemic banana cultivars predominate in production. A plantation's lifespan ranges from 4 to 30 years and yields are 5 MT/ha on average (Abodi et al. 2007). The

Figure 12 Banana production, Uganda, 2008-2014



Source: UBOS (2015).

Table 8 Cooking banana production (MT) by region, Uganda, 2008

Region	Production (MT)	Proportion (%)
Northern	31,626	0.74
Central	1,039,834	24.19
Western	2,883,653	67.07
Eastern	342,236	7.96
Total	4,299,357	100

Source: Author's calculations based on data from UBOS (2015).

second season usually achieves a slightly higher harvest than the first season (UBOS 2010b). Banana production in the highlands is more commercially oriented. Farmers in the highlands use improved crop management practices more often than farmers in lowland areas (Abodi et al. 2007). The Ugandan government has been promoting banana production with the objectives of diversifying agricultural exports, promoting agroprocessing alternatives (production of banana flour), and supporting household incomes (MAFAP 2013). The most frequent constraints to productivity are declining soil fertility in the producing areas, incidence of pests and diseases and lack of use of disease-/pest-resistant varieties, lack of adoption of improved crop management techniques, and high labor requirements (Abodi et al. 2007).

3.3 Structure of the marketing system

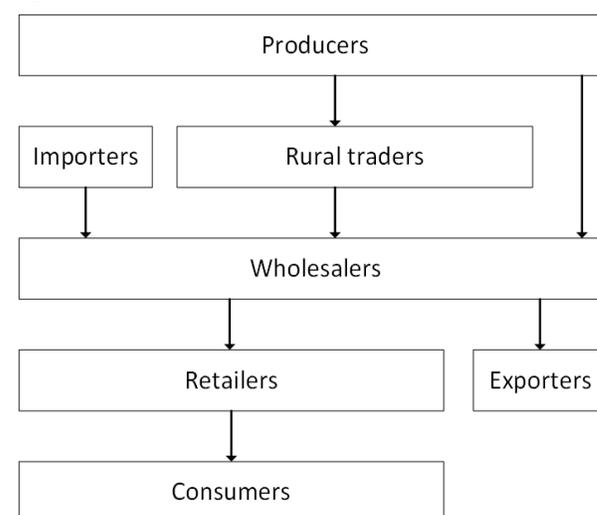
The majority of production is consumed within Uganda. Only about a third of farm output is marketed (Abodi et al. 2007). Farmers sell their harvest at the farm gate to traders (Figure 13) who either collect the produce and sell it at assembly markets to other traders and wholesalers or transport it for sale in urban markets (FEWS NET 2015). Processing of bananas into flour, dry bananas, biscuits, and breads is underdeveloped. Overall, producers have limited participation in the marketing chain due to difficulties in accessing markets (both in physical and information terms) (Abodi et al. 2007).

Among the most relevant constraints to the trade of bananas are low quality, high perishability of the produce, poor postharvest management practices that further reduce product quality and shelf life, bulkiness of the produce and the corresponding transportation requirements, and difficult access to many producing areas due to poor road infrastructure (FEWS NET 2015).

Within Uganda, cooking bananas flow from the producing areas in the western region toward key markets in Kampala, Jinja, and Gulu. Bananas from the Mt. Elgon region flow to Lira, Iganga, Jinja, and Kampala. Some of these markets further connect the bananas to markets in neighboring countries (Juba in South Sudan, Busia in Kenya) (FEWS NET 2015). Price determination along the marketing chain is largely done by bargaining.

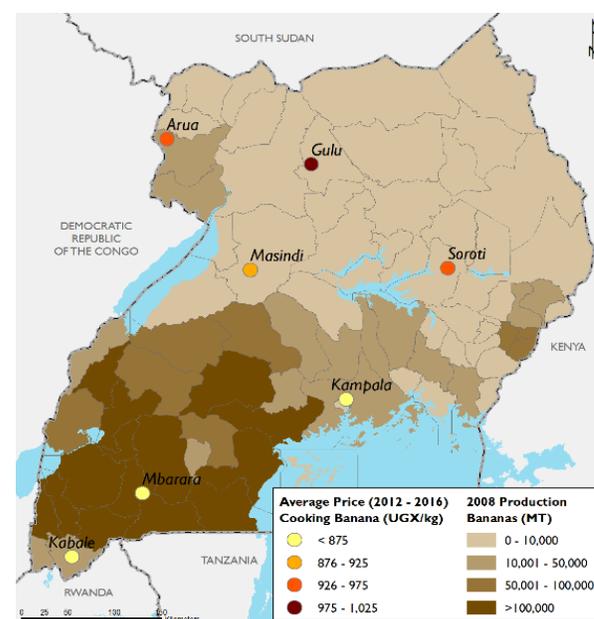
Cooking bananas are exported formally and informally. Between 2010 and 2013 bananas averaged 3.6 percent of informal agricultural exports, representing about US\$6 million, with Kenya, South Sudan, and Rwanda as main destinations (UBOS 2014b). Formal exports to Kenya, Rwanda, the United Kingdom, and Belgium also take place. Informal banana imports are lower, at about US\$2

Figure 13 Cooking bananas marketing channel, Uganda



Source: FEWS NET (2015).

Figure 14 Cooking banana production (2008) and retail price (2012 – 2016) map, Uganda



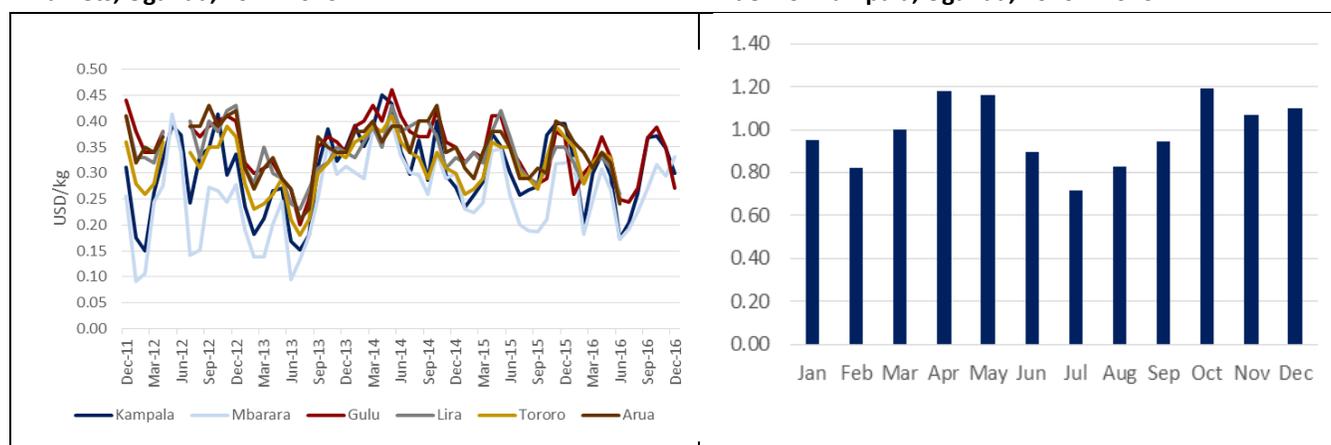
Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

million of traded value per year in the 2010–2013 period. Imports are usually of a specific plantain type (Gonja), eaten in roasted form and sourced from DRC and Tanzania (FEWS NET 2015).

3.4 Performance of the marketing system

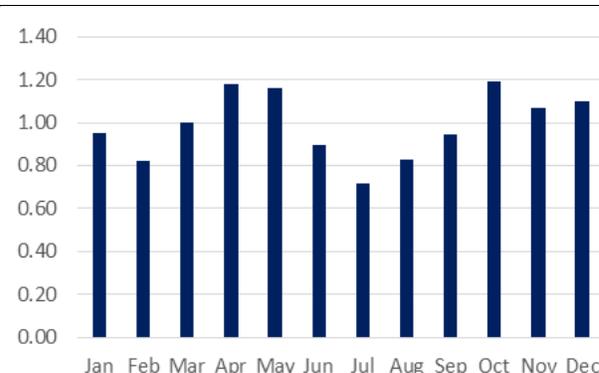
Cooking banana prices display a high degree of seasonal variation. Prices are highest in Northern and Eastern Uganda (Figure 14), where production only contributes to about 9 percent of total production (Table 8). Prices in most markets followed a similar pattern in the period between 2012 and 2016 with Mbarara and Kampala consistently displaying the lowest prices along the period. Banana prices are characterized by noticeable price differences between the months with highest and lowest price levels (Figure 15 and Figure 16). Price co-movement was assessed using correlation analysis. Statistically significant correlation coefficients over 0.7 suggest that cooking banana retail prices display a high level of co-movement across markets (Table 9). The average seasonal price index indicates that the lowest prices are observed between June and September whereas seasonally high prices are observed from March through May and October through December (Figure 16). This trend corresponds with the seasonal harvests. The coefficient of variation (CV), a measure of price variability, was 26 percent for the period from 2010 to 2016, suggesting a moderate degree of price variability.

Figure 15 Retail prices for cooking bananas in select markets, Uganda, 2011-2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 16 Average seasonal cooking bananas price index for Kampala, Uganda, 2010 – 2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

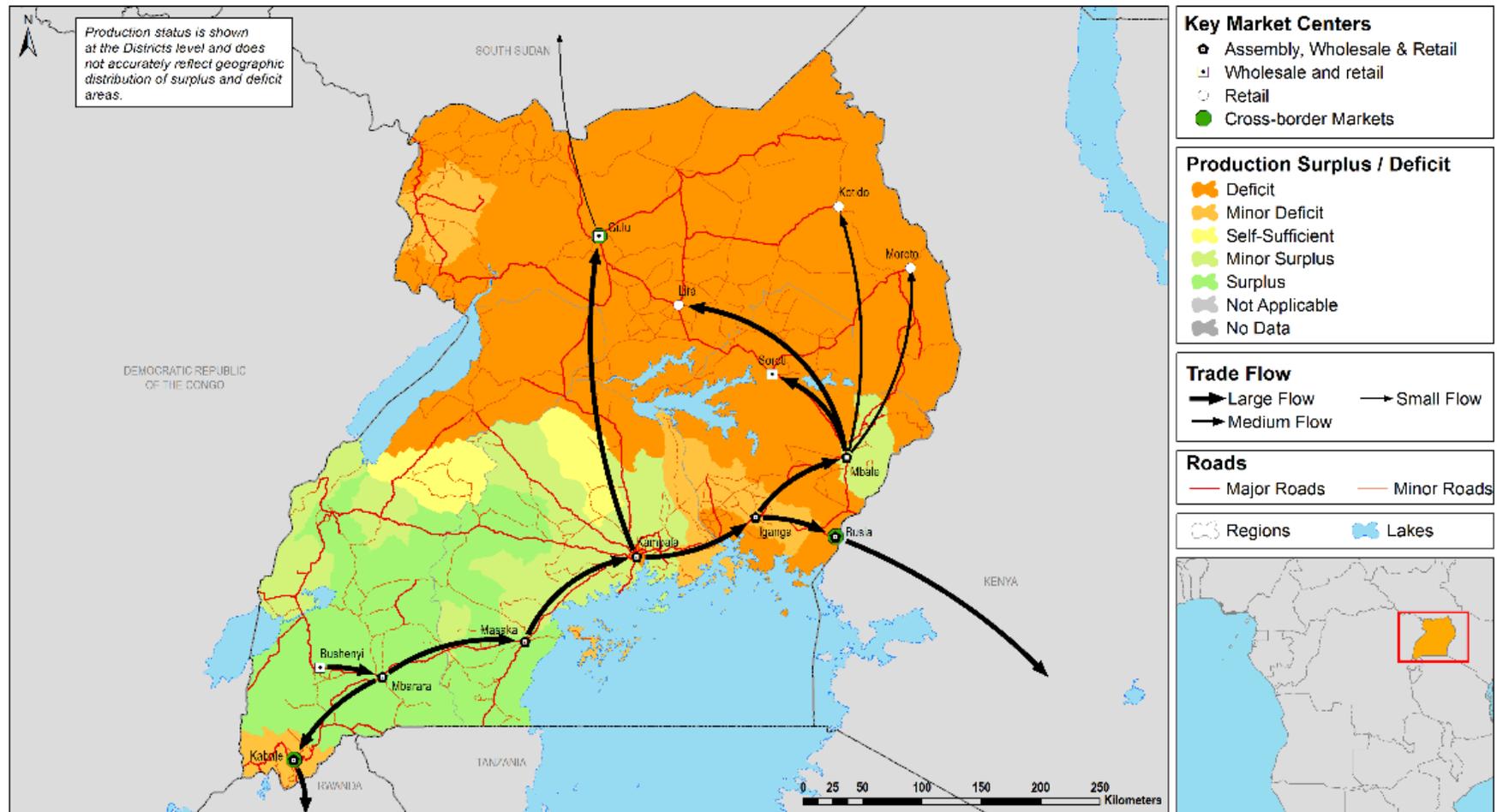
Table 9 Correlation coefficients for retail prices of cooking bananas across select markets, Uganda, 2012-16

Market	Arua	Gulu	Kampala	Lira	Mbarara	Tororo
Arua	1					
Gulu	.864**	1				
Kampala	.806**	.797**	1			
Lira	.877**	.879**	.750**	1		
Mbarara	.722**	.743**	.867**	.706**	1	
Tororo	.893**	.873**	.891**	.883**	.816**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 17 Uganda: Cooking banana production and trade flow map



Note: FEWS NET Production and Trade Flow Maps provide a summary of the geography of marketing systems that are relevant to food security outcomes during an average marketing year or season. The maps are produced by FEWS NET in collaboration with stakeholders from local government ministries, market information systems, NGOs, and private sector partners, using a mix of qualitative and quantitative data.

Source: FEWS NET (2015).

4. Cassava

Cassava is a widely consumed staple food in Uganda. The tuber is eaten fresh, dried, or processed into chips or flour. Its tolerance to drought and the possibility of harvest throughout the year make cassava an important food security crop. Most cassava marketing occurs nationally, with only limited volumes traded within the broader region.

4.1 Consumption

Cassava is one of the most widely consumed staple foods in Uganda, particularly in rural areas. Both cassava leaves and tubers are eaten. The tuber is eaten fresh, dried, or processed into chips or flour, which are used to prepare porridges and bread. Per capita consumption is estimated at 82 kg/capita based on apparent consumption figures (Table 1). Estimates indicate that about 200,000 MT of flour are consumed domestically every year (equivalent to 600,000–800,000 MT of fresh cassava) (Kleih et al. 2012). Cassava is also used for brewing drinks (Otim-Nape et al. 2005). Industrial uses include biscuit, animal feed, plywood, starch, industrial chemical, paperboard, and textile production (Chemonics 2010).

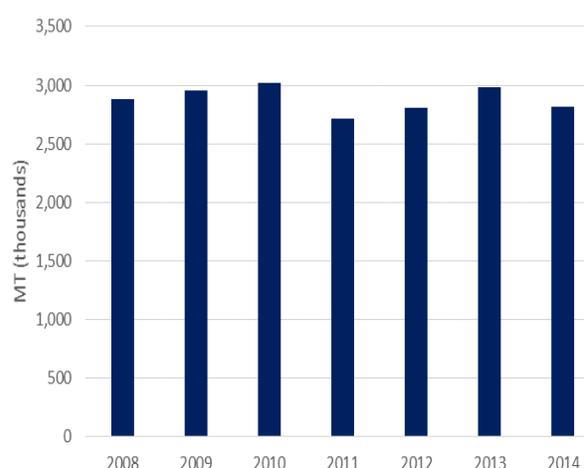
Cassava is considered an inferior food relative to maize (in urban areas) and to plantains (in some rural areas). Hence, for many Ugandan households its consumption is influenced by the price levels of these products (MAFAP 2013). In addition, when cassava prices become unaffordable for some households, they will substitute sweet potato, another important crop in Uganda. Overall, sweet and soft cassava varieties are preferred by consumers. Bitter varieties are mostly used for producing cassava flour, brewing local beer, and distilling waragi, a local gin (Kleih et al. 2012).

4.2 Production

In terms of production volume, cassava is the second most important staple food in Uganda, after cooking bananas. Figure 18 presents the production volume of cassava between 2008 and 2014. Generally, production has remained fairly stable at around 2.8 million MT, with an average area planted of 850,000 ha (UBOS 2015). The average yield is 3.3 MT/ha, but yields of up to 10 MT/ha are observed (UBOS 2015). Intercropping of cassava with other crops such as cereals and legumes is a common practice (Otim-Nape et al. 2005).

Cassava is produced predominantly by smallholders in all four regions of Uganda, who grow a range of local and improved varieties. The Eastern and Northern regions of Uganda dominate production, contributing to about two-thirds of total cassava production (Table 10).

Figure 18 Cassava production, Uganda, 2008-2014



Source: UBOS (2015).

Table 10. Cassava production by Region, Uganda, 2008

Region	Production (MT)	Proportion (%)
Northern	983,124	33.97
Central	409,810	14.16
Western	440,190	15.21
Eastern	1,061,185	36.66
Total	2,894,309	100

Source: Author's calculations based on data from UBOS (2015).

Most cassava produced is kept for own consumption. Its relevance as a food security crop relates to its tolerance to drought, its ability to survive in marginal environments, the low demand for labor for its production, and the possibility of harvesting throughout the year (MAFAP 2013; Otim-Nape et al. 2005).

The most relevant constraints to cassava production are the lack of quality planting materials and other inputs, incidence of pests and diseases, deteriorating soil conditions, poor management methods, lack of supporting services (extension, training), and the lack of credit and other financial services (Otim-Nape et al. 2005).

4.3 Structure of the marketing system

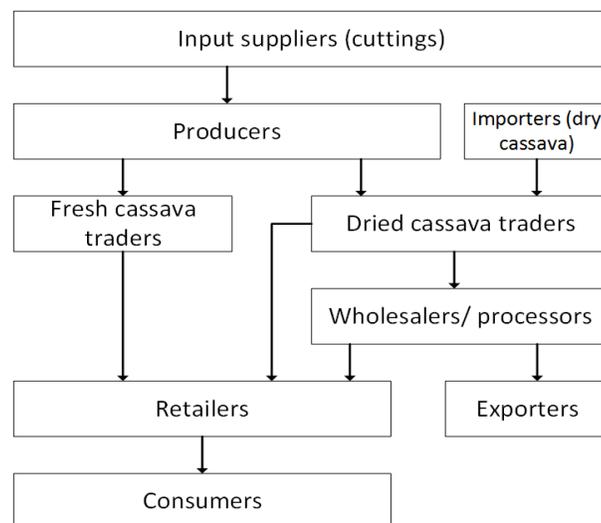
The national cassava market is characterized by the presence of a large number of buyers and sellers, which contributes to a competitive market (Figure 19). These include smallholders, traders (local and itinerant), wholesalers (district and urban), processors, and retailers (MAFAP 2013; FEWS NET 2015).

Approximately 40 percent of domestic production enters the marketing system. Due to the high degree of perishability, the marketing chain of fresh cassava is rather simple, with smallholder farmers selling cassava roots to traders who collect and transport them to urban markets, usually within 24 hours of harvest. In the case of dried cassava, farmers peel, slice, and dry the roots. They sell the dry chips to local traders or agents and to local retailers and consumers. Local traders/agents sort chips by quality type and sell to larger traders and wholesalers. Some of these wholesalers process chips directly into flour and sell it to exporters, wholesalers in urban areas, and local retailers. Millers are scattered across the country and provide on demand milling services to producers, traders, and consumers.

Cassava flour is mostly sold in traditional markets within the country, but Kampala stands out as the major wholesale and retail market (both for fresh roots and flour). Flour is also exported (formally and informally) to neighboring countries such as South Sudan, DRC, Kenya, Tanzania, and Rwanda. A small amount of informal flour imports from Tanzania and DRC has been also recorded (Kleih et al. 2012; MAFAP 2013).

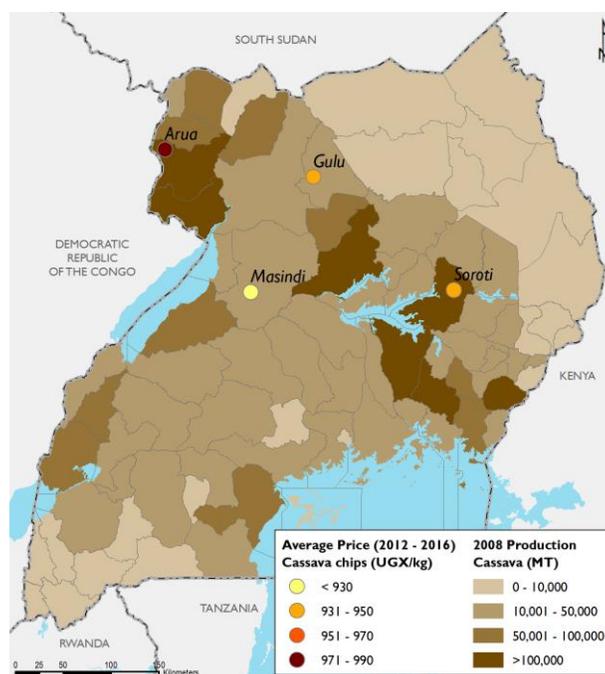
Overall, cassava is mostly traded in the domestic market. Price determination is largely done by bargaining. Lack of market information and the engagement on certain purchase arrangements (for instance, sales as “standing crop” that require buyers to harvest the produce him/herself) often result in producers receiving very low prices (Otim-Nape et al. 2005). Trade in the international market is very limited, amounting to less than 0.5 percent of total production (MAFAP 2013). Trade occurs without regard to quality standards, grading, or use of

Figure 19 Cassava marketing channel



Source: FEWS NET (2015).

Figure 20 Cassava production (2008) and average price of cassava chips (2012 – 2016) map, Uganda



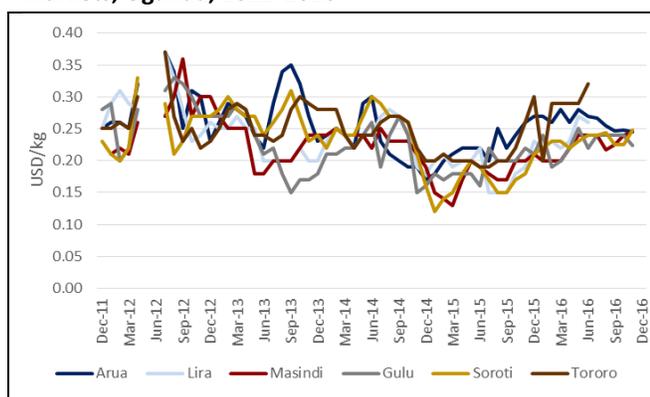
Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

standardized weight units (FEWS NET 2015). Constraints to trade include: high perishability of harvest, bulkiness, high transport demands and costs, producers' lack of access to market information, low quality (mainly related to small size), and low prices (Kleih et al. 2012).

4.4 Performance of the marketing system

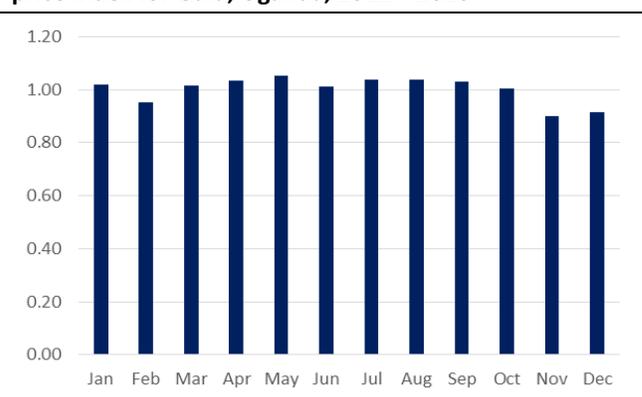
Prices for cassava chips across markets follow a similar pattern, particularly from mid-2013 onwards. Prices in Arua, Gulu, and Masindi display a slightly distinct behavior compared to other markets at certain points along the series (Figure 21). Gulu and Masindi tend to register the lowest prices along the series, while Arua and Tororo present the higher wholesale prices. The available data does not differentiate in between different cassava varieties though sweet and soft varieties are usually more expensive than bitter varieties (Kleih et al. 2012). Price co-movement was assessed using correlation analysis. Strong statistically significant correlation coefficients (over 0.6) were observed between Lira, Masindi, and Gulu suggesting a high level of co-movement in their prices while other markets displayed weaker price co-movement (Table 11). Average cassava chip prices are highest in the northwestern area of the country where cassava production is also highest. Overall, prices do not display major seasonal fluctuations, however they are at their seasonal lowest during November and December (Figure 22). The coefficient of variation for average cassava chip prices between 2012 and 2016 was 20 percent, suggesting moderate price variability.

Figure 21 Wholesale prices for cassava chips in select markets, Uganda, 2012-2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 22 Average seasonal cassava chips wholesale price index for Gulu, Uganda, 2012 – 2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

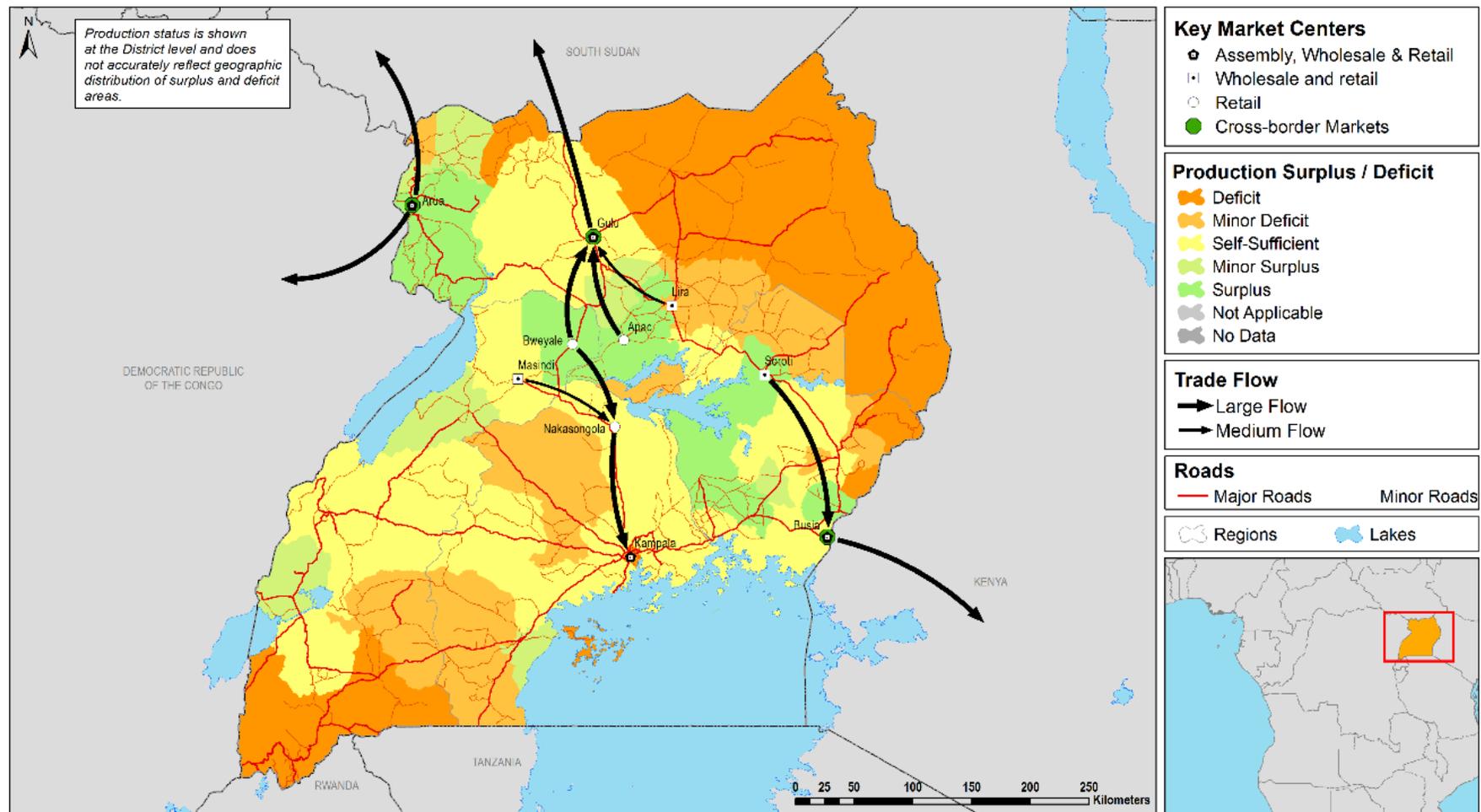
Table 11 Correlation coefficients for wholesale prices of cassava chips across select markets, Uganda, 2012-16

	Arua	Lira	Masindi	Gulu	Soroti	Tororo
Arua	1					
Lira	.409**	1				
Masindi	.381**	.614**	1			
Gulu	.389**	.685**	.706**	1		
Soroti	.571**	.482**	.564**	.432**	1	
Tororo	.559**	.604**	.406**	.303*	.568**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 23 Uganda: Cassava production and trade flow map



Note: FEWS NET Production and Trade Flow Maps provide a summary of the geography of marketing systems that are relevant to food security outcomes during an average marketing year or season. The maps are produced by FEWS NET in collaboration with stakeholders from local government ministries, market information systems, NGOs, and private sector partners, using a mix of qualitative and quantitative data.

Source: FEWS NET (2015).

5. Maize

Uganda is a net exporter of maize. The crop is primarily produced as cash crop by smallholder farmers. It ranks among the top three crops cultivated in the country in terms of area planted and production volume. Uganda plays an important role in regional maize supply and trade and recent increases in Ugandan production were driven by demand from neighboring countries.

5.1 Consumption

Maize is not a major component of the traditional diet nationwide. The city of Kampala and institutional buyers concentrate the domestic demand. About 50 percent of formal maize trade takes place in Kampala (Chemonics 2010) and the WFP and private traders (mainly under the umbrella of Uganda Grain Traders Limited) account for about 20 percent of all domestic maize purchases (Chemonics 2010; FINTRAC 2011). Maize is an important staple for the urban poor, for those associated to institutional settings (hospitals, prisons, schools, and IDP camps in northern Uganda), and for the Karamoja subregion whose distinct characteristics makes it more reliant on maize and millet rather than cooking bananas (IFPRI 2008; FINTRAC 2011).

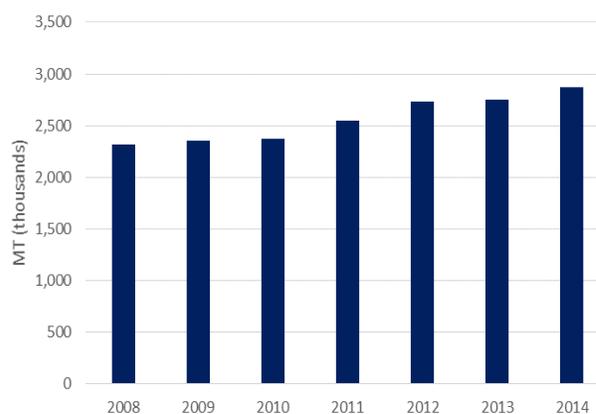
Maize is consumed boiled or grilled, as cake (posho or ugali), as a porridge, or as maize flour (MAFAP 2013). Other uses of maize include the brewing of local drinks such as Malwa, Kwete, and Waragi, and its use as animal feed, particularly in poultry production. It is estimated that over 70 percent of maize produced is consumed as food (Chemonics 2010). According to the own calculations, aggregate per capita consumption is 55 kg per year (Table 1). When considering only the share of production that is actually used as food in the balance calculations, the aggregate per capita consumption becomes 31 kg per year. This figure is consistent to what has been reported in the literature (Haggblade and Dewina 2010).

5.2 Production

Maize ranks among the top three crops cultivated in Uganda in terms of area planted and volume produced, after bananas (plantains) and cassava. In 2014, total production was estimated at 2.8 million MT and approximately 1 million hectares are cultivated annually (UBOS 2015). Maize production has increased steadily over the past years (Figure 24). Maize is produced predominantly by smallholders in all four regions of Uganda, with the eastern and western regions contributing about 70 percent of national production (Table 12).

The widespread and increasing production of maize as a cash crop in Uganda has been incentivized by the growing demand in neighboring DRC, Kenya, and South Sudan (IFPRI 2008; MAFAP 2013). The chronic maize deficit in these countries and relatively lower Uganda prices encourage maize exports (IFPRI 2008). Generally, producers find in maize a flexible crop that can either be consumed, dried and stored, fed to animals, or sold for cash (Haggblade and Dewina 2010). Maize is generally produced at the smallholder level and with minimal use of inputs. The crop is cultivated in both growing seasons, with similar yields (UBOS 2010a). Small-scale farmers contribute over 70 percent of the marketable surplus (Chemonics 2010). Maize yields vary across agro-ecological settings, but overall they remain low, ranging between

Figure 24 Maize production, Uganda, 2008-2014



Source: Author's calculations based on data from UBOS (2015).

less than 1 MT/ha and 3 MT/ha (2 MT/ha on average), compared with a potential yield between 3 and 7 MT/ha when using external inputs and improved varieties (Mugisha et al 2011; Okobi et al 2012). With adequate management and technology, potential exists for Uganda to triple production, up to 7.5 million MT. However, the increases in maize production to date are predominantly due to expansion of cultivated area (MAFAP 2013). In spite of its widespread production, factors such as low soil fertility, drought and erratic rainfall patterns, and suboptimal crop management compromise output.

5.3 Structure of the marketing system

Overall, the maize market is competitive and characterized by the presence of many buyers and sellers and low levels of concentration (Figure 25). UBOS estimates that about 3 million farm households, 1,000 traders, and over 20 exporters participate in the maize subsector (MAFAP 2013). Other participants are input suppliers, service providers (including extension), government ministries, research centers, processing and milling industries, and development/assistance organizations (FEWS NET 2015).

Barriers for entering the marketing system relate to the lack of capital or credit needed for covering the diverse marketing costs and for accessing storage. In addition, traders are required to obtain a trading/operating license to participate in the marketing chain, with fees varying depending on the volume of trade. For exports, traders require a phytosanitary certificate proving the adequacy of the product for international trade (FEWS NET 2015). Grades and standards are usually not followed, with the exception of institutional purchases (particularly WFP) based on the standards adopted by the EAC and the Uganda National Bureau of Standards (UNBS) (FEWS NET 2015).

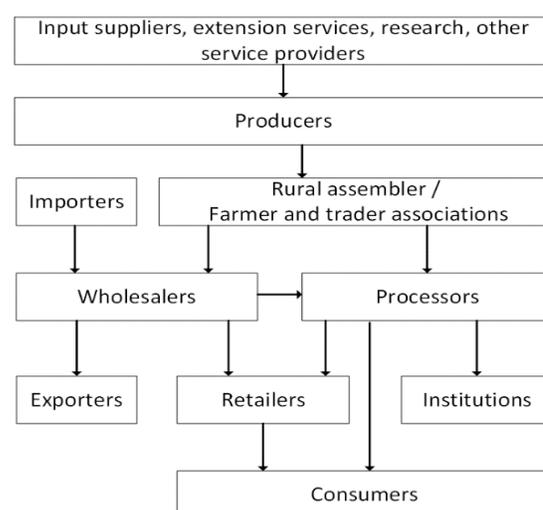
Farmers sell their grain to local traders, urban traders, or directly in local rural markets. Maize accumulated by local traders is further sold to urban traders or processors/millers. Urban traders collect grain and sell it to processors/millers, institutions, and other clients. Maize is usually processed into flour and other byproducts that find utility in the animal feed industry. Milling is mainly done at a small-scale level across the

Table 12 Maize production by region, Uganda, 2008

Region	Production (MT)	Proportion (%)
Northern	305,796	12.95
Central	449,858	19.05
Western	497,744	21.07
Eastern	1,108,556	46.93
Total	2,361,954	100

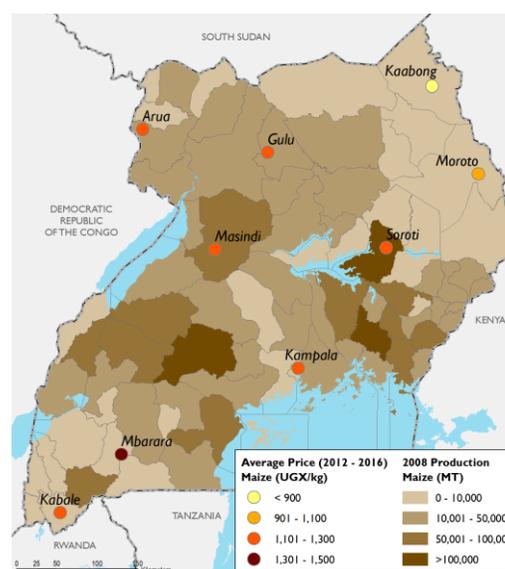
Source: Author's calculations based on data from UBOS (2015).

Figure 25 Maize (grain) marketing channel, Uganda



Source: FEWS NET (2015).

Figure 26 Maize production (2008) and price (2012 – 2016) map, Uganda



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

country and typically works on a per order basis (against a milling fee). Medium- and larger-scale millers are located in the main urban areas including Kampala and usually engage in contracts with their clients. They produce for urban and institutional consumers (Chemonics 2010).

Price determination is largely done by bargaining. While farmers have gained experience in collective trading, group marketing and coordination among traders is limited. Thus the benefits from increased bargaining power and access to market information are inaccessible for some actors along the chain. Spot marketing and the use of localized (nonstandard) units of measure are most common (FEWS NET 2015).

Within Uganda, maize flows from the main producing regions of Acholi, Lando, Masindi, Busoga, Teso, and Mt. Elgon to the main consumption areas (FEWS NET 2015; Figure 29). The key domestic markets are Kampala, which captures about 50 percent of formal trade, the Karamoja subregion, and institutional buyers such as the Uganda Grain Traders Limited (UGT), the Masindi Seed and Grain Growers Association (MSGGA), the Uganda National Farmers Federation (UNFFE), and WFP (Chemonics 2010; MAFAP 2013). Through food assistance programs for internally displaced populations within Uganda and in the broader region (DRC, Burundi, and Rwanda), WFP and its local partners facilitate access to maize (grains, flour) for targeted populations. Over the years, this assistance has represented a considerable source of domestic maize demand (IFPRI 2008; Chemonics 2010; FINTRAC 2011).

Maize exports to neighboring countries occur formally and informally through undocumented cross-border trade. Kenya is the main destination of informal maize exports, followed by DRC, South Sudan, Rwanda, and Tanzania. The main destinations for formal exports are Kenya, Burundi, Sudan, Tanzania, and Rwanda. Imports are minimal (UBOS 2014b). Within the informal export sector, maize grains are the main agricultural product exported. In 2013, maize grains represented 22 percent of total informal agricultural exports. By 2013, the value of informal exports of maize grains and maize flour was US\$36.9 million and US\$27 million, respectively (UBOS 2014b).

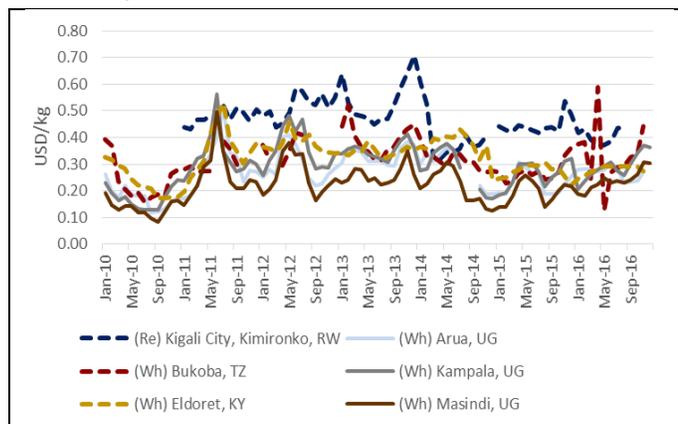
The main export markets and transit routes of maize are Busia in Kenya, Mpondwe in DRC, Mutukula in Tanzania, Gatuna in Rwanda, and Bibia in South Sudan. Export volumes are highly influenced by weather patterns and harvest levels as well as the macroeconomic conditions in both Uganda and its neighbors (Chemonics 2010; FEWS NET 2015). For example, in 2015 and early 2016, maize exports to neighboring countries declined with respect to previous years due to adverse macroeconomic conditions and other constraints to trade in South Sudan, and increased production in Kenya and Rwanda due to favorable El Niño rains (FEWS NET, FAO, and WFP 2016).

5.4 Performance of the marketing system

Prices in Uganda display similar behavior along the reference period, and are more competitive with respect to prices observed in neighboring countries (Figure 27). Prices for Juba, South Sudan were omitted as they were up to three times larger than the prices observed in Uganda. With sufficient domestic production, considerable regional demand, and competitive prices, it is clear why maize stands among the main agricultural exports for Uganda. Given the lack of enforcement of grades and standards, there are no price premiums in maize trade due to grain quality (FEWS NET 2015). Maize prices are heavily influenced by transport costs (89 percent of total marketing costs, on average) (MAFAP 2013).

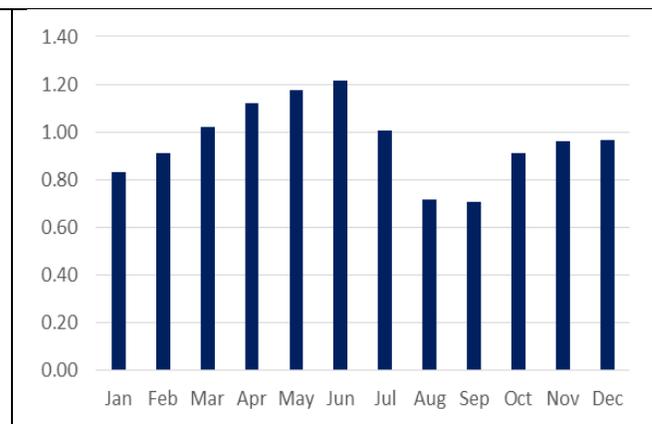
Maize prices display a high degree of inter and intra annual variation (Figure 27). The coefficient of variation for wholesale prices in Kampala, a reference market for the domestic trade, reached 29 percent confirming a high level of price variability in the 2010 – 2016 period. Prices are lowest from August to September with prices increasing from October onwards reaching their peak in June (Figure 28). Prices are strongly correlated across different markets in the country (Table 13). It has been documented that in face of high prices, maize consumers substitute toward cheaper staples, such as cooking bananas, sweet potato, and cassava (IFPRI 2008).

Figure 27 Wholesale prices for maize in select markets, Uganda and reference markets in neighboring countries, 2010-2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 28 Average seasonal maize wholesale price index for Kampala, Uganda, 2010 – 2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

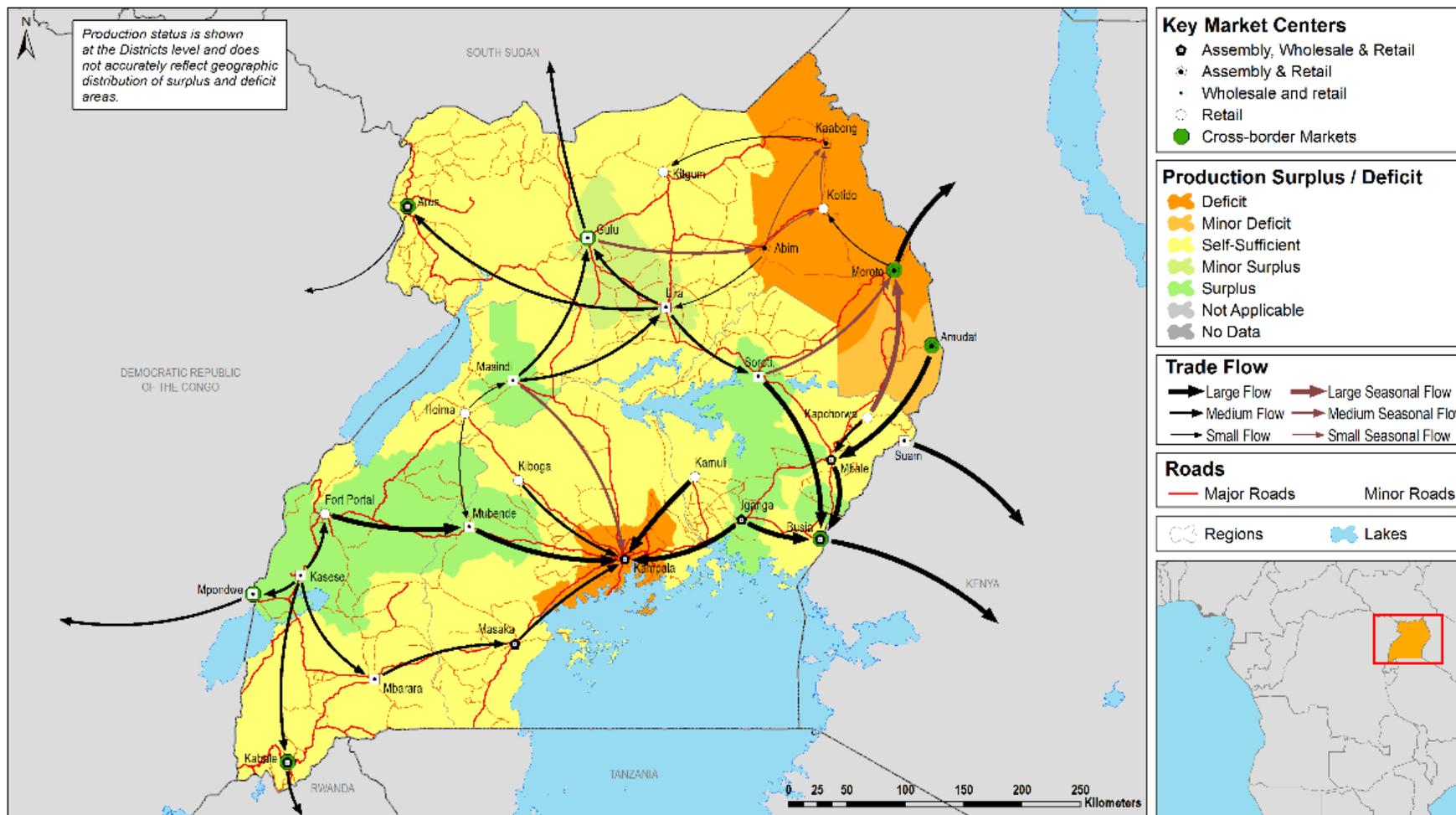
Table 13 Correlation coefficients for retail prices of maize across select markets, Uganda, 2012-2016

	Arua	Gulu	Kabale	Kampala	Lira	Masindi	Mbarara	Soroti	Tororo
Arua	1								
Gulu	.827**	1							
Kabale	.909**	.889**	1						
Kampala	.743**	.893**	.827**	1					
Lira	.865**	.927**	.891**	.816**	1				
Masindi	.815**	.902**	.840**	.795**	.919**	1			
Mbarara	.748**	.885**	.844**	.936**	.803**	.803**	1		
Soroti	.874**	.930**	.917**	.882**	.920**	.886**	.877**	1	
Tororo	.813**	.953**	.900**	.899**	.904**	.876**	.869**	.934**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 29 Uganda: Maize production and trade flow map



Note: FEWS NET Production and Trade Flow Maps provide a summary of the geography of marketing systems that are relevant to food security outcomes during an average marketing year or season. The maps are produced by FEWS NET in collaboration with stakeholders from local government ministries, market information systems, NGOs, and private sector partners, using a mix of qualitative and quantitative data.

Source: FEWS NET (2015).

6. Dry Beans

Dry beans are the most widely produced and consumed pulses in Uganda. Production is relevant for both food consumption and income generation. Most of the beans traded are dry beans, rather than fresh. There are seasonal variations in the direction of trade flows between Uganda and neighboring countries. However, on aggregate, Uganda is a net exporter of dry beans to regional markets (UBOS 2014b).

6.1 Consumption

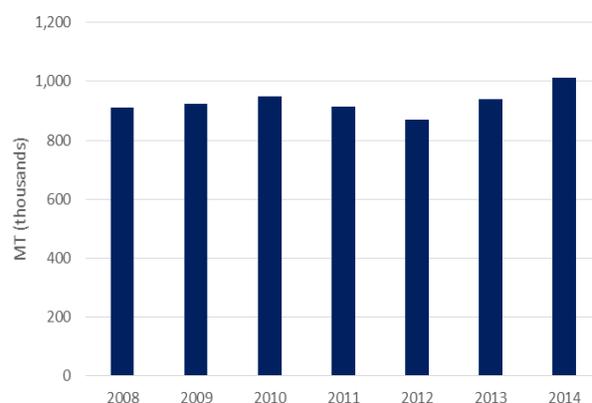
Beans provide 25 percent of total dietary calorie intake and 45 percent of protein intake in Uganda. Beans are cooked and served as a complement (“sauce”) to other staples in both private (household, businesses) and institutional settings (hospitals, prisons, schools/education centers, the military, police, government food assistance/relief distribution, and WFP) (Kilimo Trust 2012). Per capita consumption is estimated at 19 kg per year, but a decline in bean consumption has been documented, particularly in urban areas, due to the length in cooking time and the perception of bean meals as an inferior food to meat (Kilimo Trust 2012). In addition to bean size, shape, and color, factors such as cooking time, thickness in the soup produced, swelling characteristics, taste, and shelf life after cooking influence consumers’ preferences for different types of beans (Kilimo Trust 2012; Chemonics 2010).

6.2 Production

Uganda is among the main producers of beans in the EAC region (Kilimo Trust 2012). Beans are ranked fourth in terms of cropped area, after maize, plantains, and cassava. The area planted remained fairly stable in the past few years, with an average of 660,000 ha under cultivation between 2010 and 2014. Between 2008 and 2014, national production ranged between 850,000 and 1 million MT (Figure 30). Approximately 40 percent of total output is produced during the first March to June growing season. The remaining 60 percent is produced during the second September to November growing season (Kilimo Trust 2012). The Western region is the lead producer, contributing almost half of domestic production (Table 14). The Northern region follows with about a quarter of total production (UBOS 2010b).

Bean production occurs at the smallholder level and with low use of external inputs. Average plot size ranges from 0.25 ha to 1 ha and intercropping with cereals (maize, millet, or sorghum) is frequent (Chemonics 2010). Yields vary across bean varieties, ranging from 0.4–1.5 MT/ha. Bean producers decide which variety(s) to grow depending on taste, preferences, market demand, prices, and productivity. While several improved bean varieties are grown, most producers still rely on noncommercial seed from previous harvests as input. Large grain size varieties are often preferred. Threshing,

Figure 30 Bean production, Uganda, 2008-2014



Source: UBOS (2015).

Table 14 Beans production by region, Uganda, 2008

Region	Production (MT)	Proportion (%)
Northern	251,219	27.03
Central	167,276	18.00
Western	411,946	44.33
Eastern	98,833	10.64
Total	929,274	100

Source: Author's calculations based on data from UBOS (2015).

drying, sorting, cleaning, and packing usually occur at the farm level. Approximately 70 percent of the beans produced enter the marketing system. Of these, 98 percent are traded as dry beans (Kilimo Trust 2012). Among the most relevant constraints to production are low soil fertility, high incidence of pests and diseases, low use of external inputs (fertilizers and other agrochemicals), and low use of improved varieties (Chemonics 2010).

6.3 Structure of the marketing system

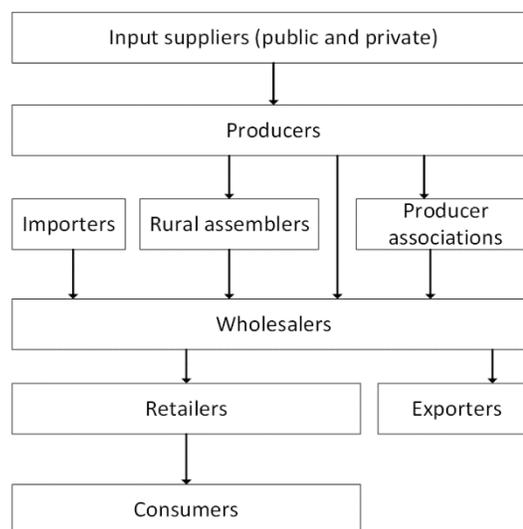
A large number of actors participate in the bean marketing system (Figure 31). Input suppliers (public and private), producers, producer groups or associations, domestic traders of different scales, international traders, processors, private and institutional consumers, and supporting institutions (government, NGOs, research) comprise the supply chain.

Producers usually sell the produce at the farm gate to local/small-scale traders, who aggregate local supplies and sell to medium- and large-scale traders and to vendors in open markets. Medium- and large-scale traders purchase directly from farmers, but also from other traders, open markets, or farmer groups. These traders sell to institutional buyers, exporters, private sector (hotels, restaurants), and retailers (Kilimo Trust 2012). Producer associations and groups support their members by promoting collective production, facilitating access to credit, storage, and collective marketing, providing training, and in some cases, engaging in production of seed (Kilimo Trust 2012).

Formal and informal exporters and importers are also part of the chain. A large number of exporters (more than 30) participate in formal trade. WFP is the largest exporter of Ugandan beans, which are directed to Rwanda, Burundi, DRC, Kenya and South Sudan (Chemonics 2010). For the case of formal bean imports, these are controlled by a small number of enterprises (Kilimo Trust 2012). With respect to informal trade, this sector is composed by a large number of both domestic and foreign traders. These traders typically mobilize small amounts of produce that are carried by foot or bike across the border (Chemonics 2010).

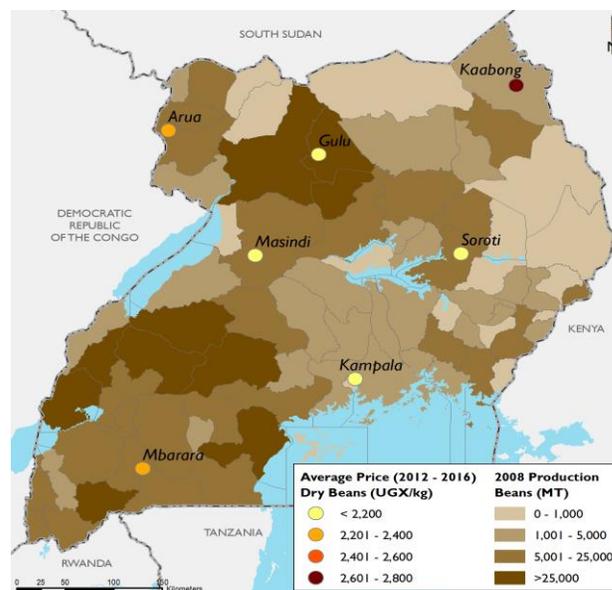
Small-scale retailers normally handle grain beans. Beans undergo a low level of value addition. The main activities relate to cleaning, sorting, packaging, and storage. In terms of processing, beans are transformed locally through the elaboration of samosas, pies, cakes, and other products that are sold in local markets. Larger-scale processing is rather limited and concentrated on the

Figure 31 Dry beans marketing channel



Source: FEWS NET (2015).

Figure 32 Beans production (2008) and price (2012 – 2016) map, Uganda



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

production of bean flour. Supermarkets deal with processed products such as canned beans, precooked beans, and packaged grain beans (Kilimo Trust 2012).

Price determination is most frequently done by negotiation between buyer and seller, usually at the spot. Overall, the bean market is underdeveloped, with most trade occurring through informal channels. The large number of buyers and sellers guarantees a competitive market. Traders' activities are constrained by lack of credit, needed for ensuring access to storage and for covering other marketing costs. Beans are traded without consideration of any grade or standard. There are no price premiums for good-quality beans (FEWS NET 2015).

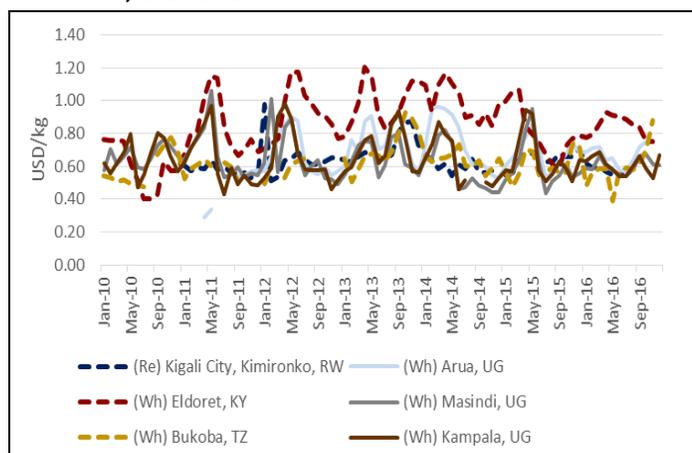
The majority of bean output is consumed domestically (Table 2). Kampala is the main consumption and transit market in Uganda. Beans typically flow from producing areas to Busia (for their export to Kenya and South Sudan) and to Gulu and Lira, from where they are further directed to Kampala and the Karamoja subregion (FEWS NET 2015). Net exports represent about 27 percent of national production. The main destinations are Kenya, South Sudan, DRC, Tanzania, Burundi, the United Kingdom, and the United States. With respect to informal cross-border trade, beans stand out as the third export product after maize and fish. In the 2010–2013 period, beans accounted for about 12 percent of informal agricultural exports (UBOS 2014b).

As for imports, canned beans, fresh beans, and specific bean varieties not widely produced in the country are the main products imported. Formal imports come from Rwanda, Egypt, Tanzania, Kenya, and the United Arab Emirates (Kilimo Trust 2012). Depending on the season, there is a reverse flow of beans between Uganda and its neighbors. For instance, in the first season beans flow from eastern DRC into Uganda, and in the second season from Rwanda. As well, reverse flows are observed for certain bean varieties that are highly favored within the region (FEWS NET 2015).

6.4 Performance of the marketing system

Bean prices tend to fluctuate due to several factors, namely: size and seasonality of harvest, source of supply, type or variety of bean, and demand from neighboring countries. By type of bean, yellow beans are the most expensive and black beans the cheapest (Kilimo Trust 2012). Prices in Uganda and reference markets in Rwanda and Tanzania show a similar behavior and variability over time. The prices in Eldoret follow a similar pattern, however they are noticeably higher for most of the period (Figure 33). The coefficient of variation for wholesale dry bean prices in Kampala was 20 percent in the period between 2010 and 2016 suggesting a moderate degree of bean price variability. Prices tend to increase between March and May and between August and October (Figure 34). As indicated earlier, these periods correspond to the two harvesting seasons. The large demand of beans for export may also be driving prices up in those key moments along the agricultural cycle. Dry beans prices present a high degree of price co-movement across all markets considered in the analysis (Table 15).

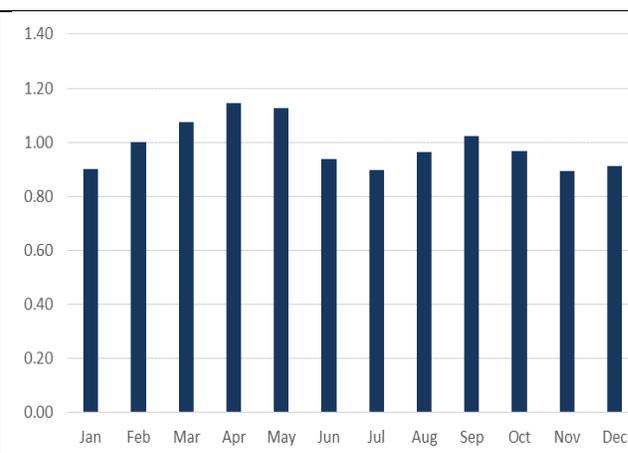
Figure 33 Wholesale prices for dry beans in select markets, Uganda and reference markets in neighboring countries, 2010-2016



Note: Prices in Eldoret, Kenya refer to Rosecoco beans.

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 34 Average seasonal dry beans wholesale price index for Kampala, Uganda, 2012 – 2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

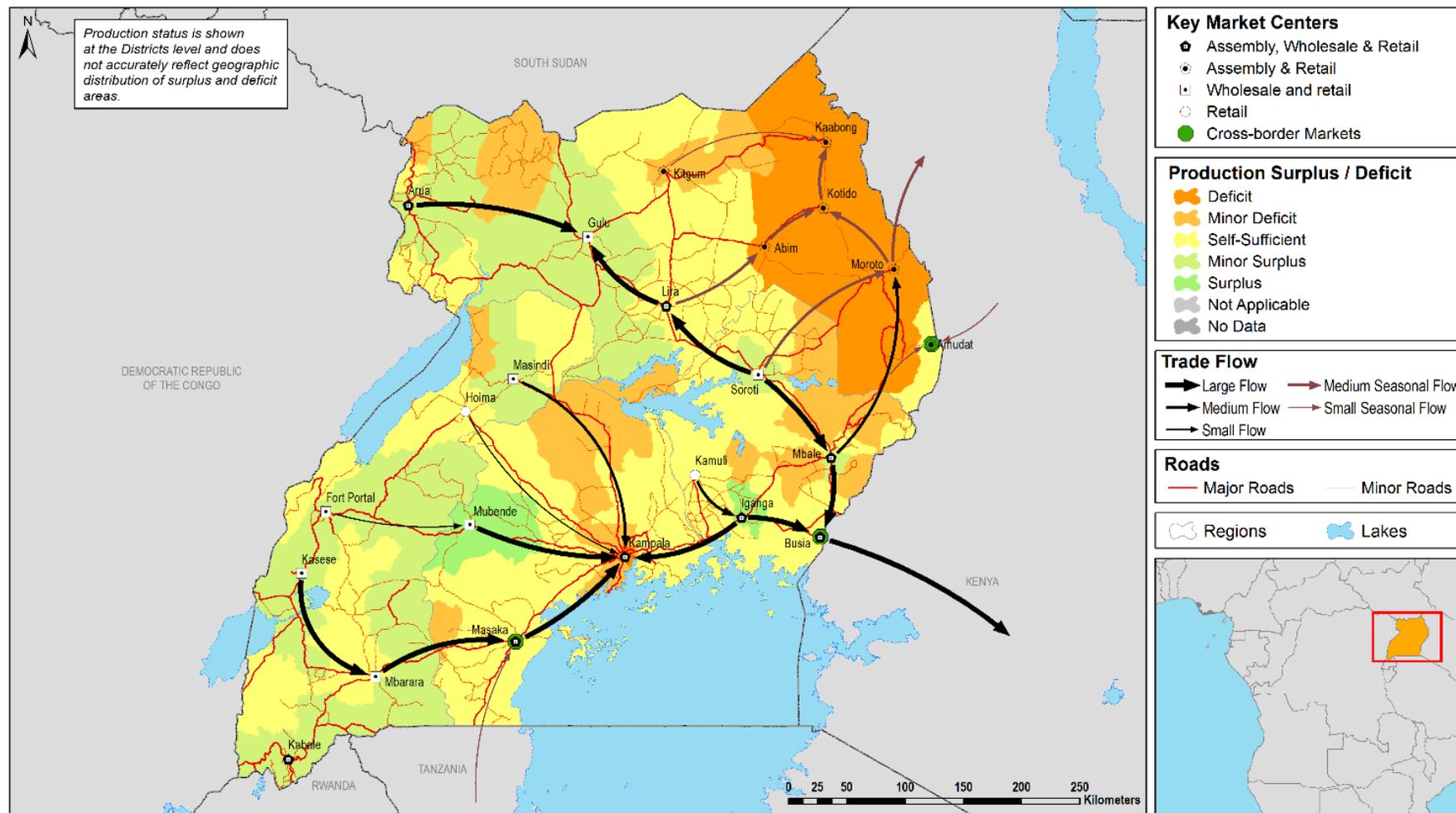
Table 15 Correlation coefficients for retail prices of dry beans across select markets, Uganda, 2012-2016

	Arua	Gulu	Kampala	Lira	Masindi	Mbarara	Soroti	Tororo
Arua	1							
Gulu	.841**	1						
Kampala	.842**	.827**	1					
Lira	.868**	.896**	.880**	1				
Masindi	.821**	.831**	.934**	.868**	1			
Mbarara	.774**	.698**	.839**	.779**	.852**	1		
Soroti	.906**	.854**	.901**	.907**	.918**	.848**	1	
Tororo	.878**	.878**	.928**	.906**	.945**	.877**	.958**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 35 Uganda: Dry beans production and trade flow map



Note: FEWS NET Production and Trade Flow Maps provide a summary of the geography of marketing systems that are relevant to food security outcomes during an average marketing year or season. The maps are produced by FEWS NET in collaboration with stakeholders from local government ministries, market information systems, NGOs, and private sector partners, using a mix of qualitative and quantitative data.

Source: FEWS NET (2015).

7. Millet and Sorghum Market

Millet and sorghum production is marginal when compared to other staples. Nonetheless, they are relevant food crops, particularly in the Eastern and Northern regions, and are exported to South Sudan and Kenya. These cereals are considered complementary to other staples and are used to produce bread, porridges, and beverages.

7.1 Consumption

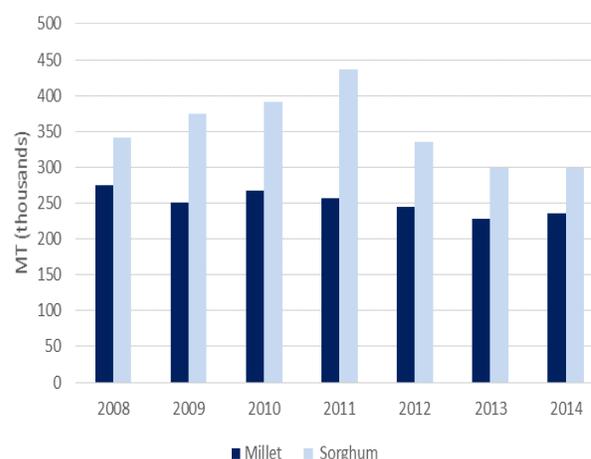
Millet and sorghum are key staples in parts of Northern and northeastern Uganda and in its southwestern highlands. Their consumption is mostly limited to producing areas, where they are used to prepare traditional foods, including bread (mixed with cassava flour), porridges, infant foods (millet-soy flour mix), couscous (sorghum), dumplings (sorghum), beer (sorghum), and other drinks (alcoholic and nonalcoholic) (FEWS NET 2015; Chemonics 2010). At the aggregate level, per capita consumption is estimated at about 7 kg per year for the case of millet and 4 kg per year for the case of sorghum (Table 2).

7.2 Production

Production of sorghum and millet is concentrated in some parts of Northern and Eastern Uganda (Table 16) and in the southwestern highlands (Kabale and Kisoro districts) (Chemonics 2010). While millet production has remained around 250,000 MT in the past years, sorghum production has been more variable ranging between 300,000 and 450,000 MT (Figure 36). Production varies across seasons and locations, depending on the allocation of land for other crops, the local rainfall pattern, the availability of labor, and the risk of pests (perceived to be lower in the first season) (Owere et al. 2014). Average yields are 1.1 MT/ha for millet and 0.9 MT/ha for sorghum (UBOS 2015).

Millet and sorghum are largely produced by smallholder farmers, who allocate small pieces of land to these crops, often as monocultures. Cultivation takes place following traditional practices, with low use of external inputs and mechanization, and using local varieties that are preferred for their taste and brewing quality (Chemonics 2010). Given their industrial potential

Figure 36 Millet and sorghum production, Uganda, 2008-2014



Source: UBOS (2015).

Table 16 Millet and sorghum production by region, Uganda, 2008

Region	Millet		Sorghum	
	Production (MT)	Proportion (%)	Production (MT)	Proportion (%)
Northern	78,573	28.37	177,090	47.12
Central	13,735	4.96	2,678	0.71
Western	77,786	28.09	62,716	16.69
Eastern	106,841	38.58	133,310	35.47
Total	276,935	100	375,794	100

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

(particularly of sorghum for beer, cereal mixes, sugar, alcohol, syrups, and fodder production), a number of larger-scale farmers have recently entered the market (Chemonics 2010).

As in the case of other staples, constraints to production include limited access to and use of external inputs, the use of low-yielding varieties, declining soil fertility, drought, and lack of access to technical and financial services to support production. For the specific case of millet, its high requirements for labor are a disincentive for many producers, who often switch to other crops with lower labor requirements and better marketing prospects (Chemonics 2010).

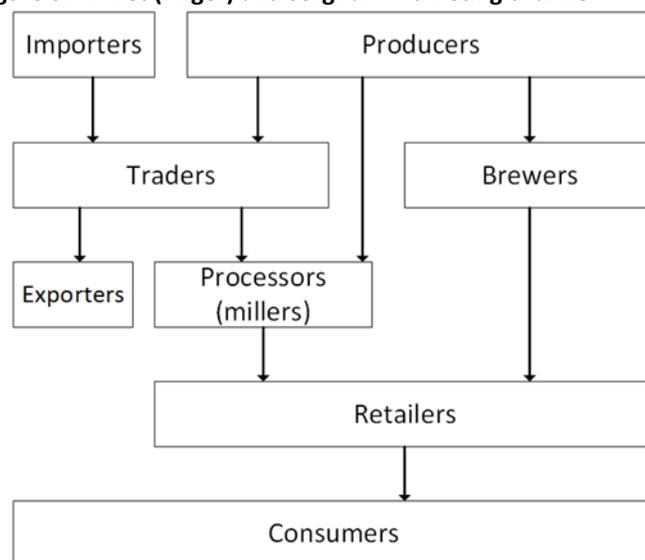
7.3 Structure of the marketing system

Traditionally, most production of both millet and sorghum was oriented toward household consumption. Marketing channels are therefore not as developed as those of other staples and remain local and at low scale (Figure 37). After harvest, the grains are dried and crushed/milled to produce flour. Traditional milling methods prevail, but small-scale milling services are also available (Chemonics 2010).

Millet producers sell approximately 20 percent of their product. They sell directly to local brewers and millers, or to local traders, who in turn sell to millers for processing into flour and packing. Millers sell the flour to retailers (shops, supermarkets). For the case of sorghum, smallholder farmers usually sell their output directly to local brewers or to local traders who collect produce and sell larger amounts either to breweries for beer production or to millers for flour production. These millers sell their product to retailers. Sorghum sold to the beer brewing industry is frequently produced under contracts. In some cases, breweries facilitate credit to their producers. Nile Breweries Ltd and Uganda Breweries are the largest breweries in Uganda (Chemonics 2010). The majority of production takes place in the northern-most districts (Figure 38 and Figure 39).

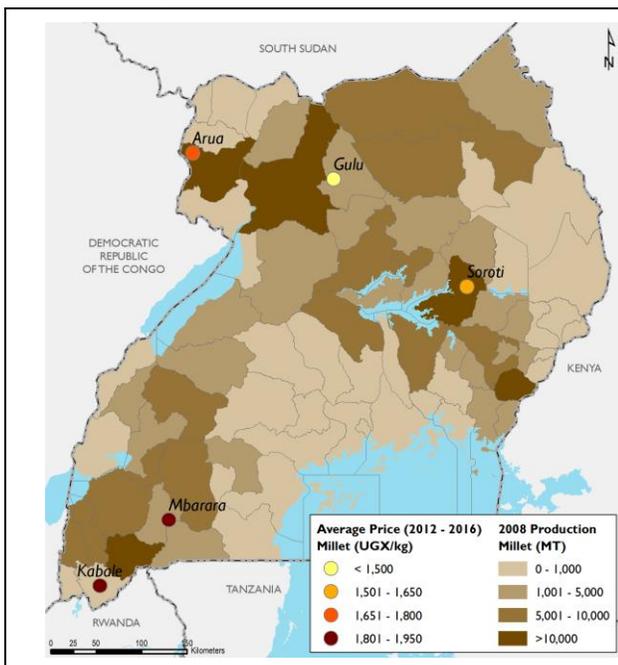
Regional sorghum and millet trade is minimal and mainly related to informal cross-border trade. Formal exports are directed to Kenya and Tanzania. Millet (grains and/or flour) is informally exported to Kenya, Sudan, DRC, and Rwanda. Imports are mainly from Kenya, Sudan, Rwanda, and Tanzania (FEWS NET 2015). As with other staples, the marketing of millet and sorghum is constrained by the availability of transport and marketing options, road conditions, high marketing costs (particularly transport), and low prices (Lubadde et al. 2015).

Figure 37 Millet (finger) and sorghum marketing channel



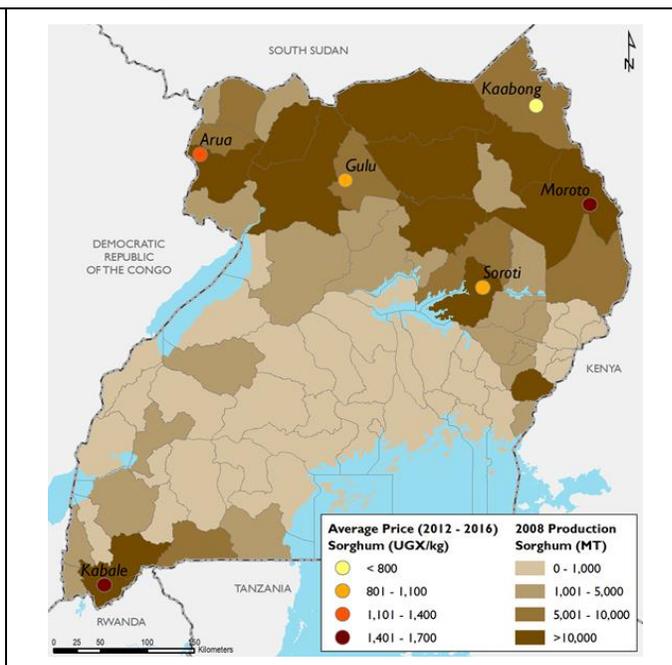
Source: FEWS NET (2015).

Figure 38 Millet production (2008) and price (2012 – 2016) map, Uganda



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 39 Sorghum production (2008) and price (2012 – 2016) map, Uganda

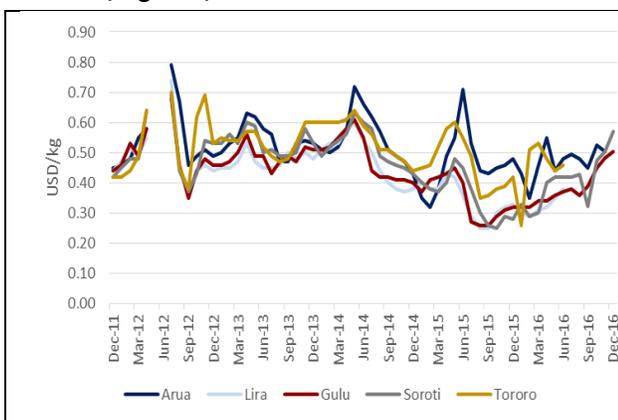


Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

7.4 Performance of the marketing system

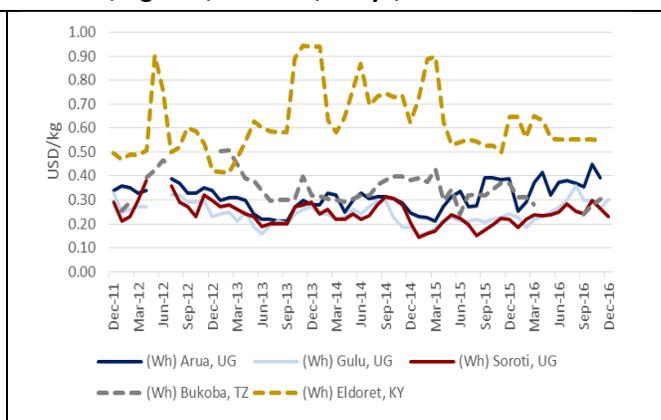
Millet prices within Uganda follow a similar pattern over time with sharp increases or reductions taking place in the short term (within 2-3 months). Gulu registers the lowest price level in the series and, Arua the highest levels. Sorghum, wholesale prices in Ugandan are lower than in neighboring reference markets. Prices in Eldoret are considerably larger. As in the case of millet, sorghum prices present variability over time, but price differentials are less marked (Figure 40 and Figure 41).

Figure 40 Wholesale prices for millet (finger) in select markets, Uganda, 2012-2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 41 Wholesale prices for sorghum in select markets, Uganda, Tanzania, Kenya, 2012-2016



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

The coefficient of variation of wholesale prices of millet and sorghum in Gulu, a key market, stands at around 20 percent, suggesting a moderate level of price variability over time for both commodities. For millet, the lowest prices occur in the second half of the year (August – October, Figure 40). For sorghum, the lowest prices occur at the beginning of the year (January – March) (Figure 40). There is a strong degree of correlation between millet prices for the markets of Lira and Gulu, Soroti and Gulu, Soroti and Masindi, and Lira and Soroti (Table 17). These price trends relationships clearly reflect the geographic relevance of this crop in the northern and eastern regions of the country. Sorghum prices are most correlated for the the markets of Lira and Gulu, and Soroti and Tororo (Table 18).

Table 17 Correlation coefficients for retail prices of finger millet across select markets, Uganda, 2012-2016

	Arua	Gulu	Kabale	Lira	Masindi	Mbarara	Soroti	Tororo
Arua	1							
Gulu	.399**	1						
Kabale	.455**	.347*	1					
Lira	.444**	.894**	.275	1				
Masindi	.365*	.691**	.399*	.644**	1			
Mbarara	.388**	.478**	.519**	.420**	.467**	1		
Soroti	.436**	.791**	.264	.787**	.791**	.410**	1	
Tororo	.457**	.557**	.500**	.495**	.407**	.495**	.470**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

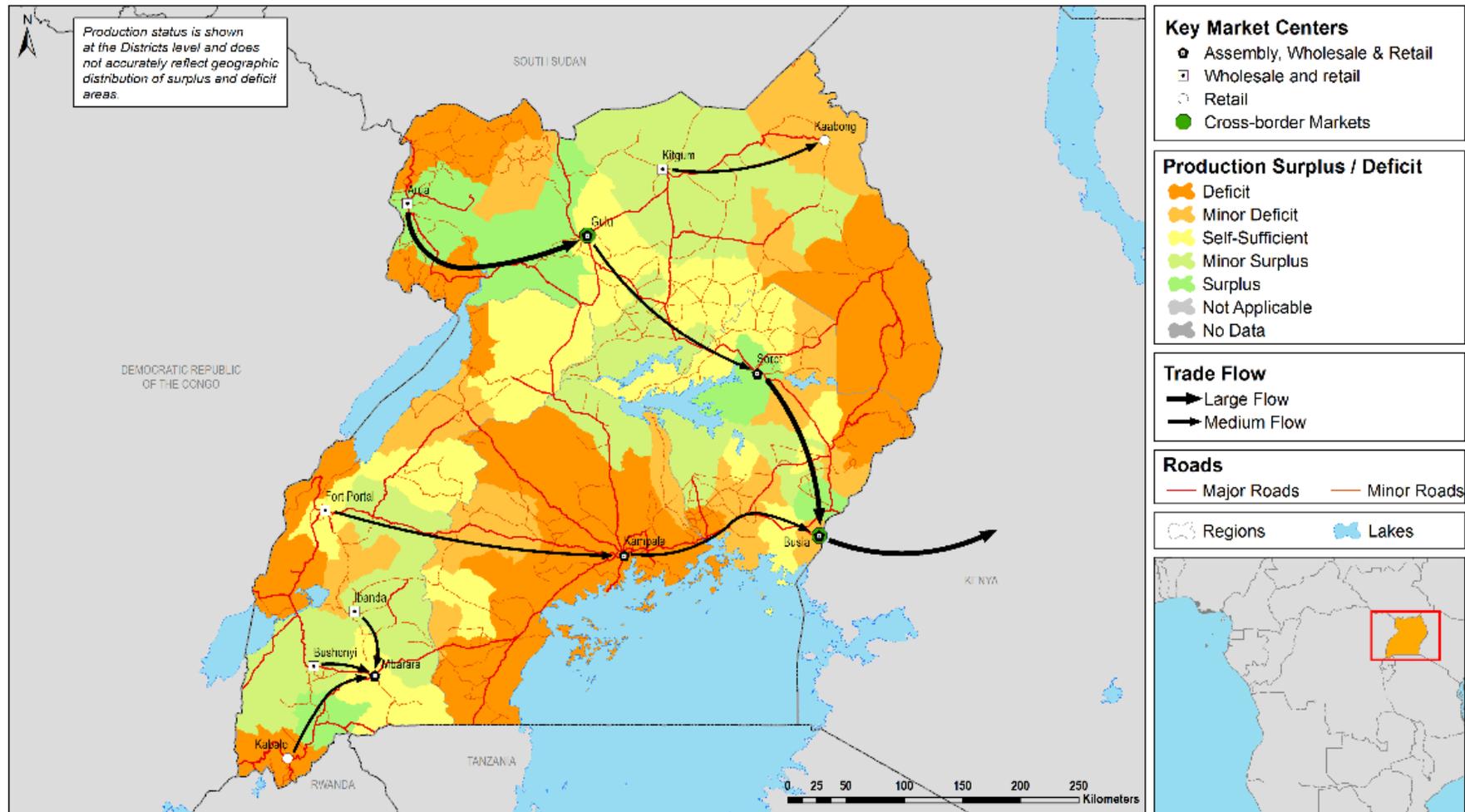
Table 18 Correlation coefficients for retail prices of sorghum across select markets, Uganda, 2012-2016

	Arua	Gulu	Kabale	Lira	Masindi	Mbarara	Soroti	Tororo
Arua	1							
Gulu	.348*	1						
Kabale	.361**	-.049	1					
Lira	.398**	.755**	.074	1				
Masindi	.449**	.559**	.155	.686**	1			
Mbarara	.323*	.495**	-.262	.606**	.317*	1		
Soroti	.226	.654**	0.055	.514**	.549**	.710**	1	
Tororo	.141	.695**	-.056	.657**	.650**	.613**	.799**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

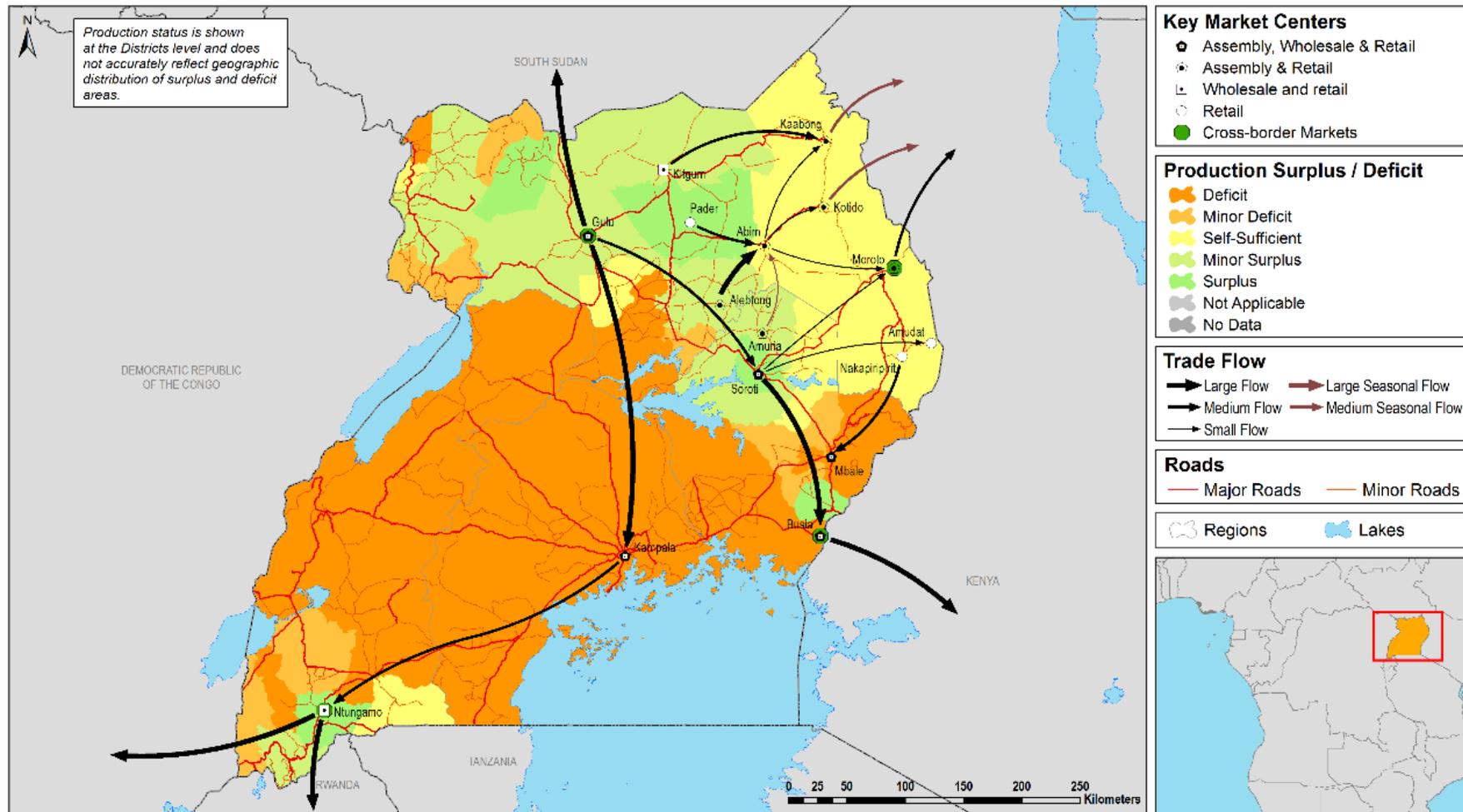
Figure 42 Uganda: Millet production and trade flow map



Note: FEWS NET Production and Trade Flow Maps provide a summary of the geography of marketing systems that are relevant to food security outcomes during an average marketing year or season. The maps are produced by FEWS NET in collaboration with stakeholders from local government ministries, market information systems, NGOs, and private sector partners, using a mix of qualitative and quantitative data.

Source: FEWS NET (2015).

Figure 43 Uganda: Sorghum production and trade flow map



Note: FEWS NET Production and Trade Flow Maps provide a summary of the geography of marketing systems that are relevant to food security outcomes during an average marketing year or season. The maps are produced by FEWS NET in collaboration with stakeholders from local government ministries, market information systems, NGOs, and private sector partners, using a mix of qualitative and quantitative data.

Source: FEWS NET (2015).

8. Livestock (Cattle, Goat, and Sheep)

The livestock subsector is an important part of the agricultural sector in Uganda and the broader economy, contributing to about 4 percent of GDP annually (UBOS 2015). Meat, mostly beef, is consumed throughout the country though in relatively small quantities. Livestock rearing is largely a subsistence practice in Uganda and cattle are considered first as a source of capital and after that as a source of meat (Agriterra 2012). Cattle act as credit and insurance protection for pastoralists and agropastoralists (IGAD 2013).

8.1 Consumption

Beef, goat meat, and mutton are consumed in Uganda, though in minimal amounts, and, for the majority of households, infrequently. Beef is the most consumed livestock product at 6.5 kg/person/year, less than half of the average amount in neighboring Kenya (14 kg/person/year) (Agriterra 2012). Goat meat and mutton are consumed in much smaller amounts, at 0.9 kg and 0.3 kg/person/year, respectively. Meat is consumed throughout Uganda since many parts of the country are not far from pastures. Indeed, it is estimated that beef consumption in Kampala, the country's largest city, only accounts for about 7 percent of national consumption (Agriterra 2012). Still, increased urbanization, population growth, and increased purchasing power are the major drivers in the increasing demand for meat.

8.2 Production

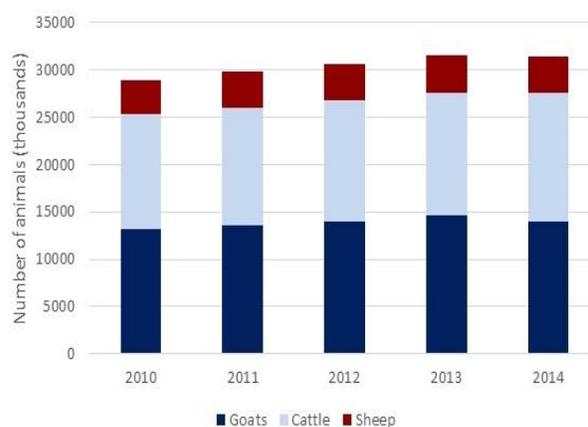
Cattle are raised in all regions of the country, especially along the cattle corridor running through the central parts of the country, and in the northern region of Karamoja (Figure 44). Indeed, the Karamoja subregion is the most important source of livestock in the country. Cattle production is largely subsistence in nature, with an estimated 90 percent of cattle raised by smallholders (Agriterra 2012). Average landholdings for livestock-rearing households are 2.2 ha. The relatively small sizes of land for livestock are indicative of the small herd sizes (UBOS 2008). Despite this, 26 percent of households in Uganda own cattle (UBOS 2008). Over 90 percent of cattle raised in Uganda are indigenous genotypes rather

Figure 44 Uganda's cattle corridor



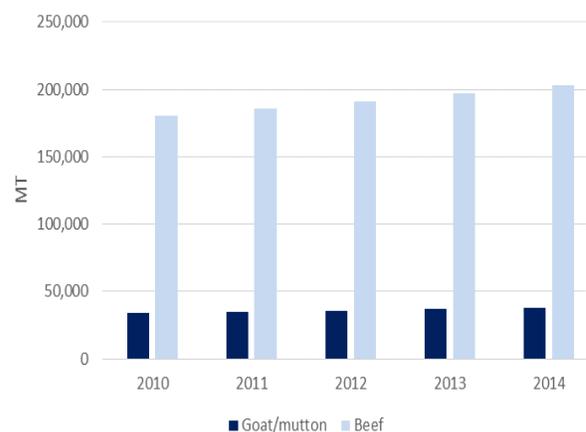
Source: Stark (2011).

Figure 45 Livestock headcount, Uganda, 2010-2014



Source: UBOS (2015).

Figure 46 Meat production, Uganda, 2010-2014



Source: UBOS (2015).

than improved breeds. Since cattle ownership is mostly seen as a source of capital rather than for meat or milk, demand for improved breeds is not strong.

In 2014, an estimated 13.8 million heads of cattle were raised in Uganda. Pastoral and agropastoral households in Karamoja owned an estimated 21 cattle versus the typical 4 for cattle-owning households in the eastern region (UBOS 2008). The central region is also an important source of livestock. Landholdings for livestock-rearing households in the central region are higher than the national average (3.5 ha) (UBOS 2008), reflecting larger herds and more area for grazing.

Cow beef is most produced type of meat in Uganda (Figure 45 and Figure 46). Still, about 40 percent of households owned goats and 9 percent owned sheep in 2008 (UBOS 2008). Similar to cattle, the Karamoja subregion has the highest concentration of goat- and sheep-owning households, with average herd sizes estimated at 19 goats and 18 sheep per household (UBOS 2008). Imports of live animals are difficult to estimate in the region, but available data suggest that relatively small numbers of cattle are imported from Kenya, Tanzania, and DRC.

8.3 Structure of the marketing system

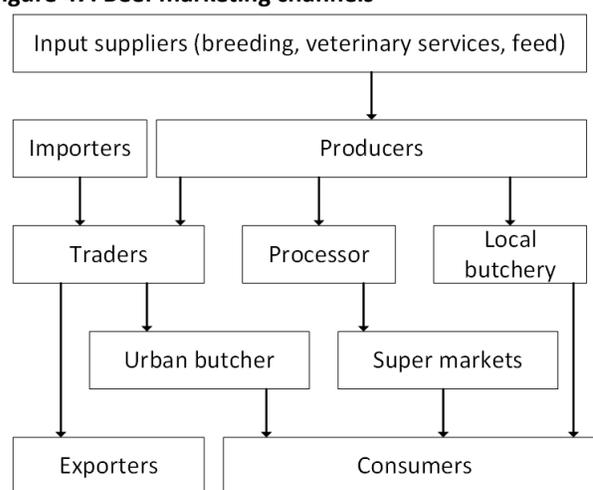
The majority of beef retailers in Uganda (75–80 percent) are roadside and market stall butcheries throughout the country (Agriterra 2012). These roadside butchers are often small operations that purchase one or two quarters of a cow from traders (Agriterra 2012). These market stalls generally lack refrigeration or other methods of cooling and have low levels of hygiene, but they are the main source of meat for Ugandan consumers.

A number of actors exist in the livestock marketing chain (Figure 47). Rural traders may purchase livestock directly from farmers or pastoralists and then bring livestock to markets to sell to larger traders, or sell directly to retailers. Larger traders may take cattle to abattoirs where they pay a fee to have the animals slaughtered rather than selling the animals to the slaughterhouse. Slaughtered animals are then sold to retailers. Most trade is conducted informally and cattle may trade hands multiple times before ultimately being slaughtered. The plethora of middlemen involved in cattle trading suggests that significant transactions costs are involved in getting cattle to retailers (Agriterra 2012).

Modern butcheries and supermarket butcher stands sell about 20 percent of marketed meat. The majority of these premium markets are located in Kampala. These markets typically buy from the few meat processors of packaged or processed beef that are located in Kampala (Agriterra 2012).

Exports of live animals and meat are limited (Agriterra 2012). Uganda exported about 192,190 heads of cattle through formal channels and 35,000 heads of cattle through informal channels in 2013. These exports only account for about 1.5 percent of the total number of cattle in the country. Most exports are to South Sudan, DRC, Rwanda, and Kenya.

Figure 47. Beef marketing channels

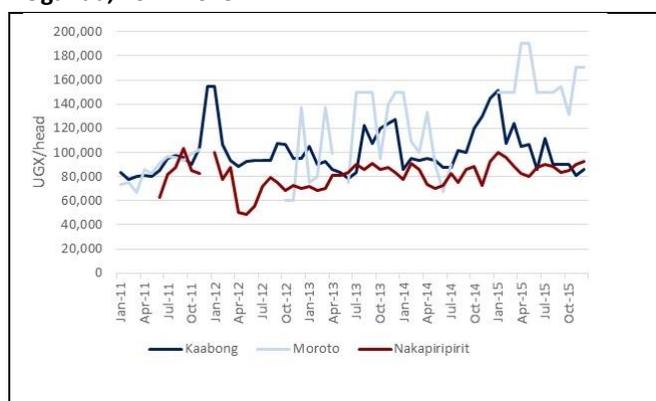


Source: Author's calculations based on data from Agriterra (2012).

8.4 Performance of the marketing system

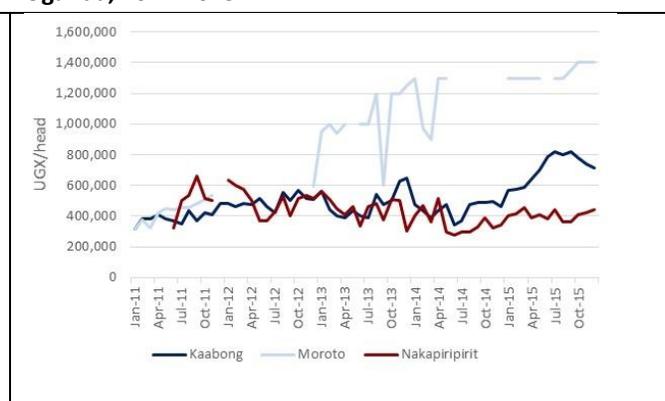
Increasing meat demand is likely to put upward pressure on prices, especially given constraints to increasing productivity of meat production though available price data do not reflect this. Because the majority of livestock are reared by smallholders who hold livestock as savings, livestock sales occur only when need arises. There is a general perception that market does not provide an adequate supply of quality animals and that supply is inelastic (Agriterra 2012). Livestock prices tend to be lower between April and June (Figure 48 and Figure 49). Price correlations across markets are relatively weak (Table 19). Only for the case of cattle in Moroto–Kaabong are stronger price correlations observed (where price data is available for Moroto), which could be an indication of price co-movement between those markets. Goat price correlation is weaker, suggesting price independence across markets.

Figure 48 Retail prices for goats in select markets, Uganda, 2011-2015



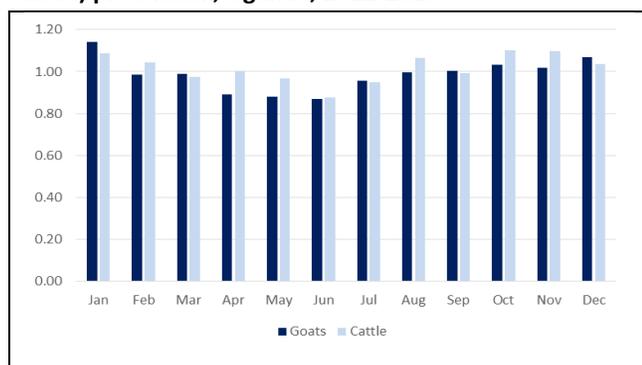
Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 49 Retail prices for cattle in select markets, Uganda, 2011-2015



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 50 Average seasonal goat and cattle (per head) price index, Uganda, 2012-2015



Note: Due to missing data in the Moroto market and for 2011, the seasonal price index was calculated for the 2012 to 2015 time period and only considers the Kaabong and Nakapiripirit price data.

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

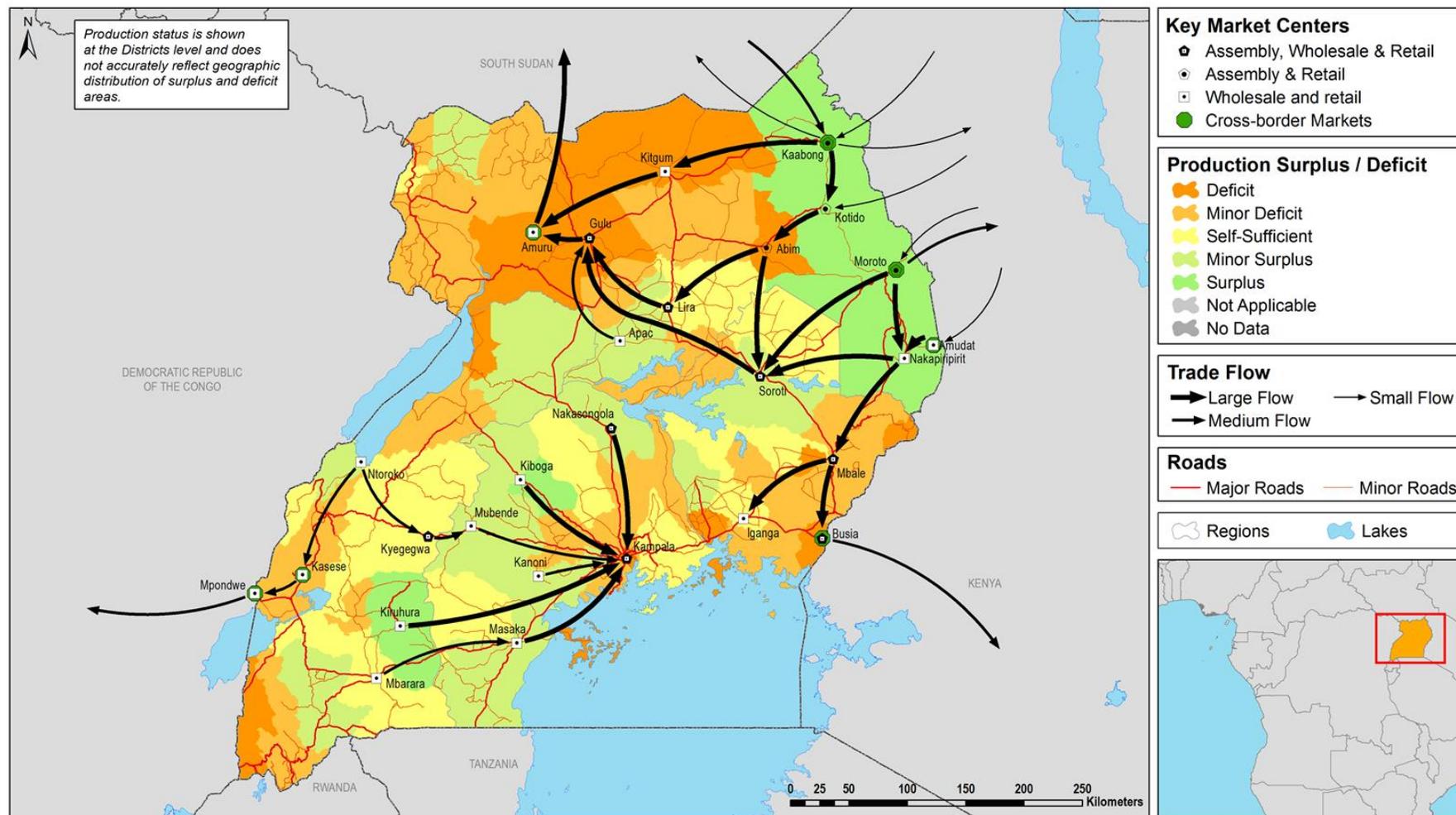
Table 19 Correlation coefficients for retail prices of goat and cattle (per head) across select markets, Uganda, 2011-15

Markets	Goat	Cattle
Moroto-Kaabong	.355*	.698**
Moroto - Nakapiripirit	.448**	-.359*
Kaabong - Nakapiripirit	.367**	-0.083

Note: * Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

Figure 51 Uganda: Cattle production and trade flow map



Note: FEWS NET Production and Trade Flow Maps provide a summary of the geography of marketing systems that are relevant to food security outcomes during an average marketing year or season. The maps are produced by FEWS NET in collaboration with stakeholders from local government ministries, market information systems, NGOs, and private sector partners, using a mix of qualitative and quantitative data.

Source: FEWS NET (2015).

9. Edible oil

The edible oil sector in the country is predominantly based on the processing of imported crude palm and sunflower oil. Domestic oilseed (predominantly sunflower) production is insufficient to meet the increasing demand (Ferris et al. 2001), a situation that makes Uganda heavily dependent on oil imports (Okello, Biruma, and Deom 2010). According to the Vegetable Oil Development Project (VODP), Uganda imports close to 70% of its edible oil needs in the form of crude palm and sunflower oil (MAAIF, n.d.).

9.1 Consumption

Annual consumption of oils and fats in Uganda is generally low at an estimated at 5.6 kg/per person (MAAIF, n.d.), however the demand for vegetable cooking oil has been increasing at an annual rate of 3 percent during the last decade. Vegetable oils and fats are widely used at the household level and by the food industry. Further demand of oil products originates in the cosmetic, pharmaceutical, and chemical industries (Okello, Biruma, and Deom 2010). Consumers tend to have low brand loyalty since oil and fat consumption is price sensitive, particularly among the poorer population segments. However, branded refined palm oil is sometimes considered of superior quality. Locally produced sunflower oil is considered heavy and thick (Ferris et al. 2001).

9.2 Production

Edible oil production in Uganda is predominantly based on oil extraction from sunflower. Oil extraction from groundnuts, soybean, cottonseed, and sesame also takes place but at a very low scale. Domestic production is estimated at 150,000 MT per year, on average (FAO 2016). With the objective of reducing import dependence and supporting agricultural incomes, the Government of Uganda has promoted the development of oil palm and oilseed crops in eastern and northern Uganda. Oilseed producers in the high producing areas around Lira, Mbale, Gulu, and Arua have participated in the VODP since the late 1990s (MAAIF, n.d.). Large-scale processors such as BIDCO Uganda Limited and Mukwano Industries Limited play a key role in supplying diverse types of edible oil in the Ugandan market.

9.3 Structure of the marketing system

Oilseed crop production in Uganda takes place at the smallholder level. Farmers typically sell their oilseeds to traders or assemblers at the farm gate or in their villages, as well as to local small-scale millers. After aggregation, traders sell to large-scale processors for oil extraction and further processing (refinement, fortification). Large-scale processors also source crude palm oil from wholesale importers. Retailers source from processors and other oil traders. More direct market linkages have been established between domestic producers or producer organizations and the processing industry through the VODP (Vellema et al. 2013). Other participants in the supply chain are input suppliers, service providers (including extension), research centers, and development/assistance organizations (MAAIF, n.d.).

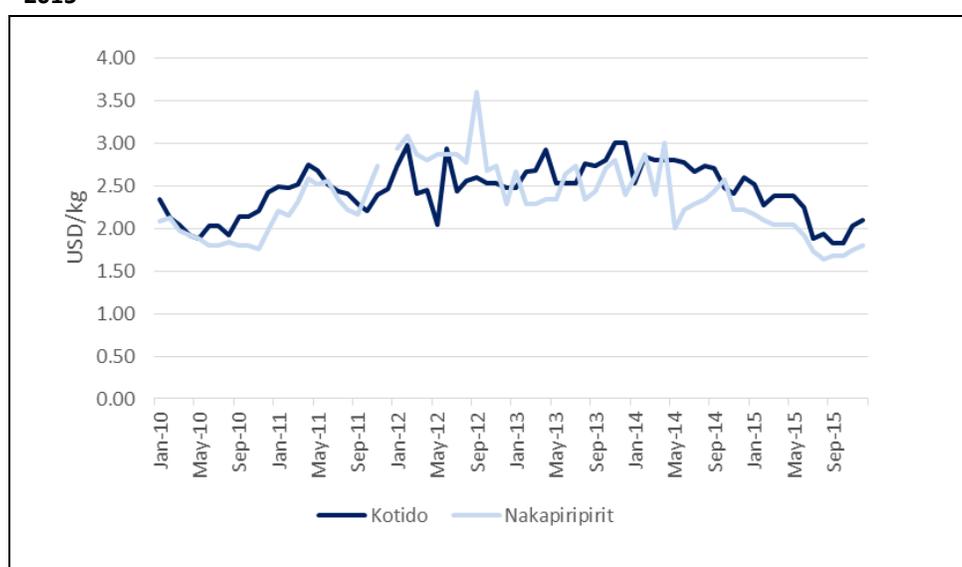
Edible oil processing is largely controlled by two refineries, BIDCO and Mukwano, which together capture about 80 percent of the domestic edible oil market. While BIDCO specializes in palm oil processing (imported and domestic), Mukwano focuses on sunflower seed production and processing. Aponye Uganda Limited processes a variety of grains (maize, beans, sorghum) as well as imported crude palm oil. Aponye's main clients are institutional buyers (Ministry of Defense, Police and Prisons, and the Red Cross). Oil produced by both Mukwano and BIDCO is fortified with Vitamin A, while BIDCO also fortified with vitamin D. Each of these processors manage different brands, that differentiate based on the commodity processed (maize, sunflower, palm oil), their mix (or lack of), and their suggested use (for frying, general cooking (FEWS NET 2016). At the retail level, edible oil is sold

in small plastic bags (up to 100 ml), small bottles (250 ml), soda bottles (330 ml), and larger bottles and containers (jerry cans) reaching up to 20 liters (Ferris et al. 2001; FEWS NET 2016).

9.4 Performance of the marketing system

Limited price data is available for the analysis of price patterns across the country and with neighboring countries. Figure 52 shows the retail prices for vegetable oil in two markets located within the Karamoja sub region. While these markets present some variability in oil price over time, prices in Moroto and Kaabong have remained fairly constant at 5,000 UGX/L and 7,000 UGX/L. (1.8 USD/L – 2.52 USD/L) during the past 2 years. This directly reflects the underlying structure of the marketing system, where a few firms influence production and marketing throughout the country.

Figure 52 Retail prices of edible oil (mixed) in selected markets in Uganda, 2010 - 2015



Source: Author's calculations based on data from WFP Uganda; Farmgain Africa and UBOS (2016).

10. Information gaps

Further information on the following aspects will help to better understand staple food markets in Uganda:

- The dynamics and factors influencing the depreciation of the Uganda shilling and how they transmit to the staple food market system. Since 2008, the Uganda shilling has depreciated with respect to the US dollar. Weak commodity exports, a current account deficit, falling commodity prices, and strengthening of the US dollar are often considered the main factors behind this trend.
- The quantity of food staples demanded by the Ugandan government and other development actors (such as WFP and I/NGOs) for food assistance, nationally or abroad. The procurement of food in Uganda for its use as food assistance is well recognized. For some commodities, such as maize, this demand appears to be of considerable size in relation to the overall marketed supply and might be impacting local prices. Up-to-date information regarding institutional commodity demand and sourcing locations/markets is needed to understand the effects of local procurement on Ugandan food markets and food access.
- A characterization of current trade dynamics between Uganda and South Sudan and how these are affected by instability in the region. This would facilitate a better understanding of their influence on regional staple food production and trade.

11. Market Monitoring Plan

FEWS NET regularly monitors staple food market dynamics in both presence and RM countries. It is neither necessary nor possible for FEWS NET to effectively monitor all commodities markets at all times. Rather, the Markets and Trade Knowledge team focuses on monitoring the status of a select group of indicators over a given marketing year. Those key indicators include the status of key activities and events that are likely to influence market supply and demand dynamics and the resulting price levels and variability in key reference markets. FEWS NET also regularly monitors incentives for trade flows out of areas of relative abundance into those of relative scarcity. Some of these indicators have threshold values that are used in practice, in combination with other information, to suggest when one might have reason to be concerned about food availability and/or access at a national or subnational level. The results of such monitoring are regularly reported in FEWS NET's Price Watch and Price Watch Annex and also serve as essential inputs into the FEWS NET project's integrated food security analysis.

Figure 53 FEWS NET's approach to market monitoring and analysis

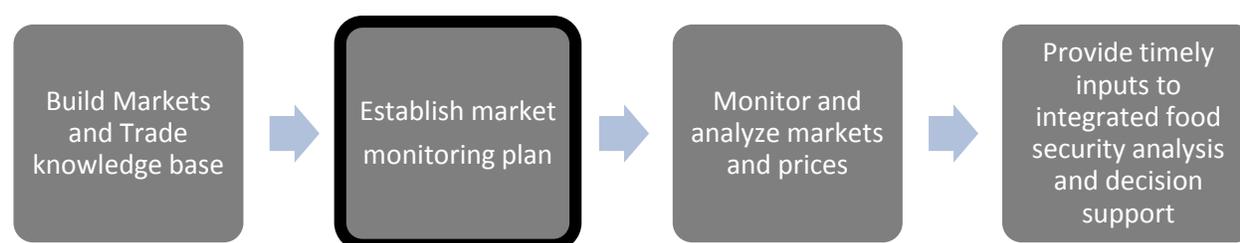


Table 20 provides an overview of general aspects to monitor with respect to the broader staple food market in Uganda.

Table 20 General aspects to monitor vis-à-vis staple food markets in Uganda

Domestic production	Growing conditions at key growing stages, for all commodities Planting decisions at the beginning of each growing season (area planted, expected harvest) Seasonal calendar (update based on conditions prior to planting) Domestic production estimates, nationally, regionally, and by district
Price monitoring	Wholesale prices, for all commodities Retail prices, for all commodities Price relationships (for complement and substitute commodities)
Food balance	Quantification of amount used for food, for other uses, and wasted, for all commodities Characterization of household food consumption patterns
Trade flows (quantities)	Formal, all commodities, from and to Uganda Informal, all commodities, from and to Uganda Seasonality of trade flows (reverse flows) with neighboring countries Monitoring of trade patterns at major border crossing points
Domestic and cross-border marketing cost	Market performance of all commodities
Government policies	Policies or programs that have an effect on the production, trade, or consumption of the commodities analyzed
Regional context	Social and political situation in South Sudan Food supply in South Sudan Food supply in Kenya Food supply in DRC
Food assistance	Amount of procured food for food assistance, from Uganda
Macroeconomic context	Exchange rate, against US dollar and neighboring currencies Inflation Consumer price index

Table 21 identifies specific aspects that need to be monitored for the different commodities presented in this document.

Table 21 Key areas to monitor for the different commodities under analysis

Topic	Details
Maize	Institutional demand Industrial demand for maize Regional maize prices Regional maize supply Size of post-harvest losses Size of storage and transport losses
Beans	Institutional demand Regional bean prices Regional bean supply Size of post-harvest losses Size of storage and transport losses
Cassava	Industrial demand (flour, drinks, and others) Key harvest times Conversion ratio of fresh cassava to dried cassava chips Size of post-harvest losses Size of storage and transport losses Cassava demand in Kampala
Millet and sorghum	Industrial demand (flour, foods, beverages) Production conditions and calendar in the Karamoja subregion Size of post-harvest losses Size of storage and transport losses Changes in consumption preferences (substitution)

Annex 1. Karamoja subregion

1. General context

The Karamoja subregion is located in the northeastern part of Uganda and comprises the districts of Kaabong, Kotido, Abim, Moroto, Napak, Nakapiripirit, and Amudat. By 2014 the total population in this region reached 965,008 inhabitants, 92 percent of them in rural areas. The Karamojan population represents 2.8 percent of Uganda's total population.¹ Environmental conditions vary within the region, making some areas better suited for agricultural production and livestock rearing than others. In contrast to the rest of the country, Karamoja has only one agricultural season due to a unimodal rainfall pattern that runs from April through September. The peak of the lean season is between the months of May and July. Poverty and marginalization, poor infrastructure, conflict, insecurity, drought, and periodic food shortages have afflicted the area for decades, resulting in the need for long-lasting food assistance. Karamoja is considered to be the least developed area in Uganda.

2. Food supply

Overall food availability in Karamoja is ensured through local production of diverse crops, livestock, and wild foods, and through the import of food from other areas of Uganda and from neighboring countries (seasonal trade). Crop production takes place principally in the central, south, and west areas of the region, which benefit from higher rainfall levels. The most relevant crops grown are sorghum (which is cultivated all over the region), maize, millet, groundnuts, sunflower, peas, Irish potatoes, sweet potatoes, and cassava. Karamoja is Uganda's main cultivation area for sorghum and millet, but production of other crops is at very low levels when compared to the rest of Uganda. Livestock production, while widespread across Karamoja, is particularly relevant toward the east of the region, where pastoralism is the main livelihood activity. In fact, the Karamoja subregion is located along the cattle corridor that extends from northeastern to southwestern Uganda (Agriterria 2012). Karamoja is the main livestock-producing area in the country, supplying other regions in Uganda and South Sudan. Within eastern Africa, Karamoja is important in trade dynamics since it plays a key role in livestock transit for Kenyan cattle moving into Uganda and it is also the source of diverse products that are traded with South Sudan and Kenya through cross-border trade.

Droughts, dry spells, erratic rainfall patterns, and pest/disease infestation are the most relevant threats to agricultural production within the region. Overall, the region is structurally deficit in staple food production. The exception to this general dynamic is Abim district, which is generally self-sufficient in staples. FEWS NET's assessment suggests that structural food availability is not a major concern in all areas of Karamoja, as: (i) diverse crops are produced locally or are imported from other areas of Uganda; (ii) livestock production is widespread and animal products (meat and milk) are usually available; and (iii) the local population also has access to different wild foods. Rather, low purchasing power of the local population appears to be the major concern and threat to food security.

3. Food demand

Between 60–70 percent of household income in Karamoja is used to purchase of food (Fintrac 2011). Income sources include the sale of agricultural products (grains, cash crops, and livestock), casual labor, charcoal production, collection of firewood, sale of local brew, and petty trading (Burns, Bekele, and Akabwai 2013). As a food-deficit region, a large proportion of Karamojan households typically rely on market purchases of grains

¹ Calculations based on 2014 Population Census results at district level.

(maize, sorghum) between 3 and 7 months a year. Overall, approximately 35 percent of household food needs in Karamoja are sourced from the market (Fintrac 2011).

Market dependency varies across districts; for instance in Kaabong and Abim, crop production is more developed and households have a lower level of market dependence since they allocate a share of their production for own consumption needs (Fintrac 2011). On the other hand, in Moroto, Kotido, Nakapiripirit, and Amudat, where livestock husbandry is a major activity, the majority of households rely on market purchases to fulfil their needs. Pastoralists rely on livestock rearing as a source of livelihoods and savings. In times of hardship, livestock are sold to access the resources needed to cover households' immediate needs. Livestock sales happen habitually at critical periods of the year when household expenditures are greatest (the lean season and when school fees are due).

4. Food trade

Karamoja has two marketing basins, which cover the northern and the southern areas of the region and engage in trade with South Sudan and Kenya and the rest of Uganda. The northernmost marketing basin is linked with the high-production areas of Gulu and Lira, while the southernmost marketing basin is linked with Soroti. In terms of trade with Kenya, livestock enter Karamoja from Kenya while grains are exported (transit is probably more accurate). Transactions are predominantly based on cash.

Both large and small food markets exist in Karamoja, with the largest weekly markets found in district capitals/centers. Small markets exist across the region, but many are highly seasonal in nature and operate only very briefly (for only a few hours) at strategic points of the year, particularly the harvest and postharvest period when local producers are selling their crops; during the lean season small trucks/lorries travel into more isolated areas of the region with food stuffs for sale.

Overall, the quantities of food traded are limited, resulting in very thin markets. Analysis of the level of competition in these small markets must take these dynamics into consideration, as "natural" monopoly/monopsony situations may arise due to high transportation and transaction costs (including the time required to offload/sell goods) that may create only limited incentives for trade to take place.

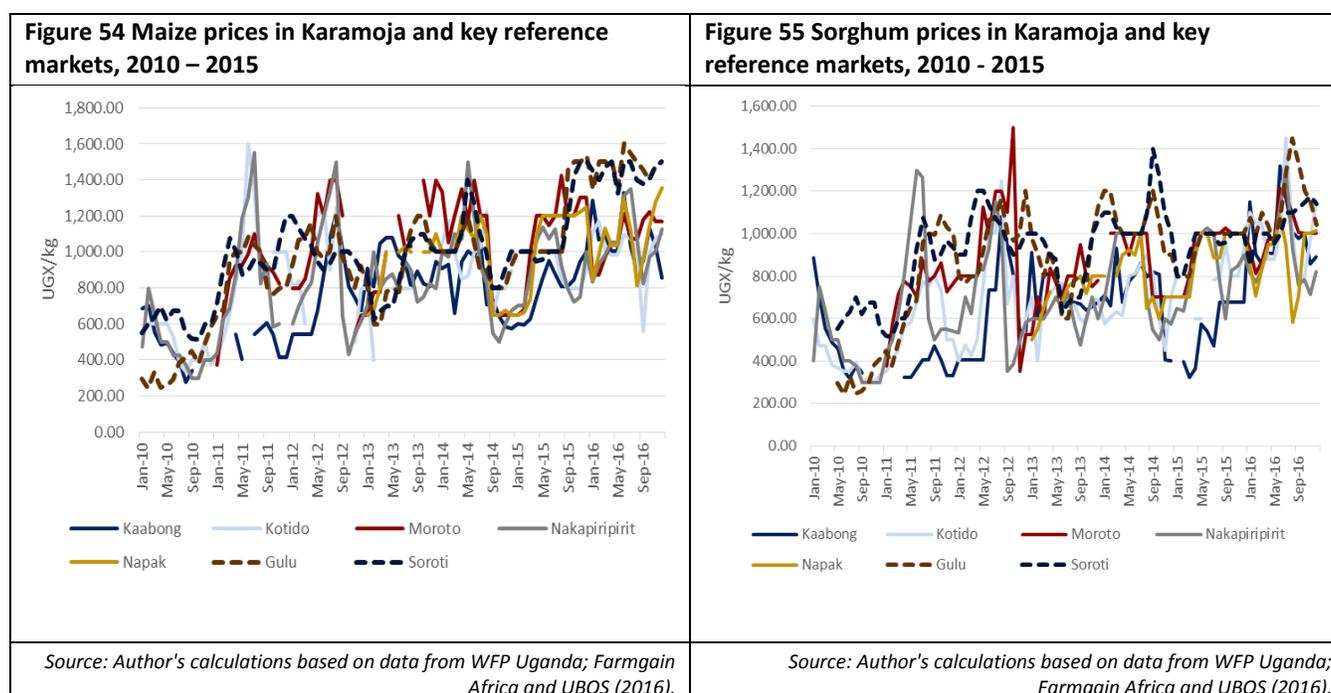
Several actors participate in Karamoja's food trade, with small-scale traders dominating market activities. These traders operate as wholesalers or retailers, as needed, and following consumer demand. Traders stem mainly from outside Karamoja, particularly from Mbale, Teso, Lira, Soroti, and Sironko. The Karamojong participate in trade activities mostly at the very local level. Hence, trade in Karamoja is dominated by non-Karamojong. Presence and participation of traders from Kenya or South Sudan is very low. Kenyan and South Sudanese traders link with regional markets through Ugandan traders from Acholi, Bugisu, and Teso (Ezaga 2010).

Local Karamojan populations participate in two specific types of market activities. They serve as buying agents for traders from outside the region during the harvest and postharvest period. Local populations are also involved in milling of maize, sorghum, and millet, which takes place at weekly markets via locally owned, diesel-powered mills. Millers are only service providers (they do not buy and sell grain) and do not have warehouses/storage capacity.

The degree of integration between Karamoja and the rest of the country is higher between areas with better road access. However, seasonal effects and other factors (such as quarantines limiting livestock flow) generate particular dynamics within the region that need to be further understood. Contextual factors in Kenya and South Sudan influence trade flows with Uganda/Karamoja. For instance, the crisis in South Sudan led to a decline in trade

flows between the two countries. Similarly, a higher exchange rate (South Sudan pound relative to the US dollar and Uganda shilling) affects traders' ability to import commodities from Uganda to South Sudan.

Agricultural prices are often reported to be “high” in Karamoja, but preliminary results suggest that price dynamics are more nuanced. For example, when comparing maize prices between Soroti and Gulu (two main areas that serve the Karamoja subregion) and maize prices in Karamoja, both the mean price levels and variation (coefficient of variation) are similar (Figure 54 and Figure 55). Prices across Uganda are highly seasonal, and prices in the Karamoja subregion are no exception.



Karamoja faces constraints to agricultural trade similar to those in the rest of Uganda, namely: Poor road network and infrastructure, which in some areas become impassable during the rainy season, long distances to markets; prevalence of animal diseases that result in restrictions on animal movement (through quarantines) within and outside Karamoja, high marketing and transportation costs, poor integration markets within Karamoja, and a lack of regular access to market information for many actors in the marketing system.

Annex 2. Stakeholder workshop participants

Uganda Market Fundamental Report
National Stakeholder Workshop Participants
February 25-26, 2015, Royal Imperial Hotel, Kampala, Uganda

#	Name	Title	Organization / Institution	District of Work
1	Ms. Daisy Eresu	Desk Officer Cassava	Min. Agriculture (MAAIF)- Crop Production and Marketing	Entebbe
2	Mr. Paul Boma	Program Leader and Animal Production Scientist	Livestock and Fisheries Research and Development Nabuin ZARDI P.O. 132, Moroto	Moroto
3	Mr. Fred Ahimbisibwe	Senior Cooperative Officer	Ministry of Trade Industry and Cooperatives (MTIC)	Kampala
4	Mr. Othieno Odoi	Senior Production and Trade Officer	National Planning Authority	Kampala
5	Mr. Kenneth Egesa Represented by Richard Kiwanuka	Director Statistics Index of Agriculture production (Statistician)	Bank of Uganda	Kampala
6		Executive Director	Uganda Export promotion Board	Kampala
7	Ms Agnes Atyang	Private consultant		Kampala
8	Mr. Hamidu Tusiime	SPA-VAM	World Food Program (WFP) Uganda Country Office	Kampala
9	Mr. Julius Lwegaba	Team leader	Weltl Hunger Hilfe Moroto	Moroto
10	Mr. Samuel Mugarura	National Technical Manager	Famine Early Warning Systems Network (FEWS NET) P. O. Box 74644, Clock Tower, Kampala, Uganda	Kampala
11	Mr. David Luwandaga	Market specialist	Farm grain	Kampala
12	Mr. John Jagwe	Senior Lecturer	Uganda Christian University Department of Agriculture Faculty of Science P. O. Box 4, Mukono	Kampala
13	Mr. Reagan Kiweewa	Consultant	Makerere University	Kampala
14	Mr. Thomas Awuor	RFSI-M&T	FESNET	
15	Ms. Alice Gitta Okecho	OMA	FWESNET	Kampala
16	Mr. Andrew M Kizito	Consultant	Makerere University	Kampala
17	Mr Kiiza Barnabas	Associate Professor	Makerere University Department of Agribusiness and Natural Resource Economics	Kampala
18	Ms. Fiona Lukwago	Team leader	Kilimo Trust	Kampala
19	Ms. Kelly Wanda	CEO Tradenet consultants	Tradenet EA	Kampala
20	Mr. Muyanja Mudathini	Marketing Consultant	KAM Suppliers & Contractors Kampala: Old Kampala, Plot 32 Rashid Khamis Road, Change Agent House opposite Mukwano Mall	Kampala

Annex 3. National stakeholder workshop agenda

Uganda Market Fundamental Report
National Stakeholder Workshop Agenda
February 25-26, 2015, Royal Imperial Hotel, Kampala, Uganda

Day/Hour	Activity	Responsibility
Wednesday, February 25, 2015		
08:00	Registration	FEWSNET
	Session I: The Opening Session	
9:00	Welcome	Mr. Sam Mugarura, FEWSNET Uganda
9:15	Opening Remarks	Thomas Awour, FEWSNET Kenya
9:30	Overview of the Workshop	Dr. Andrew Muganga Kizito, Makerere University
10:15	Coffee / Tea Break	
	Session II: Crosscutting constraints /issues that affect food availability and access	
10:30	Factors that affect production (availability) of staple crops in Uganda	Dr. John Jagwe, UCU
11:00	Factors that affect livestock production (availability) in Uganda	Dr. Paul Boma
11:30	Factors that affect trade (access) flow in Uganda	Mr. Fred Ahimbisibwe/
12:00	Government policies that affect availability and access	Mr. Othieno Odoi (NPA) / Andrew Muganga
12:30	Discussion	
13:00	Group Photo	
13:10	Lunch	
	Session III: Key Staple Food Crops Sub-sectors / Value Chains in Uganda (Groups)	Dr. Muganga Kizito Makerere University
14:00	We shall breakup into five groups. The key issues to be developed in each session are the following: <ol style="list-style-type: none"> 1. Main production and marketing seasons in the year 2. Main surplus and deficit areas 3. Main staple crops and livestock trade flow directions (maps) 4. Main marketing actors in the channels (value chain diagram) 	
	Groups	
	1. Maize and maize flour	Dr. John Jagwe/ Mr. Peter Abong
	2. Beans	Mr. Peter Abong /Kelly Wanda
	3. Banana	Mr. Sam Mugarura
	4. Cassava, millet and sorghum	Ms. Daisy Eresu
	5. Livestock (Cattle, Goat, Milk)	Dr. Julius Lwegaba / Dr. Paul Boma
16:00	Coffee / Tea Break	
16:30	Remaining information gaps and Indicators to monitor	

Day/Hour	Activity	Responsibility
Thursday, February 26, 2015		
	Session IV: Integration of Markets in Karamoja and Impact of Crisis in South Sudan on Markets in Uganda	
9:00	Impact of crisis in South Sudan on markets in Uganda	Dr. Julius Lwegaba / Dr. Paul Boma
10:00	Coffee / Tea Break	
10:00	Integration of markets in Karamoja	Dr. Julius Lwegaba / Dr. Paul Boma
11:00	Recap: Objectives and Summary of Discussions	Dr. Andrew Muganga Kizito
12:00	Feedback: Evaluation forms	Mr. Thomas Adour
12:30	A Vote of Thanks	Mr. Sam Mugarura
13:00	Adjourn and Lunch	

References

- Abodi, Pamela, Fredrick Bagamba, Mgenzi Byabachwezi, Svetlana Edmeades, Robert Kalyebara, Deborah Karamura, Enid Katungi, et al. 2007. "An Economic Assessment of Banana Genetic Improvement and Innovation in the Lake Victoria Region of Uganda and Tanzania." Washington, D.C.: IFPRI, Research Report No. 155
- Adong, Annet, Tony Muhumuza, and Swaibu Mbowa. 2014. "Smallholder Food Crop Commercialization in Uganda: Panel Survey Evidence from Uganda." Kampala, Uganda: EPRC.
- AfDB. 2014. "Markets and Agricultural Trade Improvement Project." Abidjan, Côte d'Ivoire: AfDB.
- Agriterra. 2012. "Identification of Livestock Investment Opportunities in Uganda." Arnhem, Netherlands: Agriterra.
- Bank of Uganda. 2016. "Foreign Exchange Rates." Bank of Uganda. https://www.bou.or.ug/bou/rates_statistics/statistics.html
- Burns, John, Gezu Bekele, and Darlington Akabwai. 2013. "Livelihood Dynamics in Northern Karamoja." Washington, D.C.: Mercy Corps.
- Chemonics. 2010. "Market Assessment and Baseline Study of Staple Foods." Washington, D.C.: USAID.
- Coronel, Ana Lucia. 2015. "IMF Survey : Uganda's Ambitious Infrastructure Plan Set to Boost Economy." Washington, D.C.: IMF.
- Dalsgaard, Jens Peter Tang, Malcolm Dickson, John Jagwe, and Catherine Longley. 2012. "Uganda Aquaculture Value Chains: Strategic Planning Mission Report." Montpellier, France: CGIAR.
- EAC. 2014. "East African Community Annual Report 2013-2014." Arusha, Tanzania: East African Community.
- Ezaga, Patrick. 2010. "Markets for Livestock and Food Crops in Karamoja Subregion." Rome, Italy: FAO.
- FAO. 2003. "WTO Agreement on Agriculture: The Implementation Experience - Developing Country Case Studies." Rome, Italy: FAO.
- FAO. n.d. "Uganda Food Balance Sheet." <http://faostat3.fao.org/download/FB/FBS/E>.
- Farmgain and UBOS. 2016. Uganda Price Database. Accessed August 2016. <http://farmgainafrica.org/>
- Ferris, R.S.B., C. Collinson, K. Wanda, P. Jagwe, and P. Wright. 2001. "Evaluating the Marketing Opportunities for Shea Nut and Shea Nut Processed Products in Uganda." Technical Report. Chatham, UK: Natural Resources Institute.
- FEWS NET. 2010. "Livelihood Mapping and Zoning Exercise: Uganda." Washington, D.C.: FEWS NET.
- FEWS NET. 2015. "FEWS NET Uganda Field Assessment Report." Washington, D.C.: FEWS NET.
- FEWS NET. 2016. "FEWS NET Karamoja Field Assessment Report." Washington, D.C.: FEWS NET.

- FEWS NET, FAO, and WFP. 2016. "East Africa Crossborder Trade Bulletin." Washington, D.C.: FEWS NET.
- Fintrac. 2011. "Uganda Bellmon Estimation." Washington, D.C.: Fintrac.
- Haggblade, Steve, and Reno Dewina. 2010. "Staple Food Prices in Uganda." East Lansing, Michigan: MSU.
- IFPRI. 2008. "An Assessment of the Likely Impact on Uganda Households of Rising Global Food Prices." Washington, D.C.: IFPRI.
- IGAD. 2013. "The Contribution of Livestock to the Ugandan Economy." Nairobi, Kenya: IGAD.
- Karugia, Joseph, Juliet Wanjiku, Jonathan Nzuma, Sika Gbegbelegbe, Eric Macharia, Stella Massawe, Ade Freeman, Michael Waithaka, and Simeon Kaitibie. 2009. "The Impact of Non-Tariff Barriers on Maize and Beef Trade in East Africa." Nairobi, Kenya: Regional Strategic Analysis and Knowledge Support System, East and Central Africa
- Kilimo Trust. 2012. "Value Chain Analysis of the Cassava Sub-Sector in Uganda." Kampala, Uganda: Kilimo Trust.
- Kleih, Ulrich, David Phillips, John Jagwe, and Michael Kirya. 2012. "Cassava Market and Value Chain Analysis Uganda Case Study." London, U.K: Natural Resources Institute, University of Greenwich, UK
- Lubadde, Geoffrey, Pangirai Tongoona, John Derera, and Julia Sibiya. 2015. "Pearl Millet Socioeconomic and Production Characteristics in Uganda." Kampala, Uganda: National Semi Arid Resources Research Institute of the National Agricultural Research Organisation-Uganda.
- MAAIF. n.d. "Vegetable Oil Development Project (VODP)." <http://vodp.agriculture.go.ug/index.php/profile/project-management-unit>.
- MAAIF. 2013. "National Agriculture Policy." Kampala, Uganda: Ministry of Agriculture, Animal Industry, and Fisheries.
- MAFAP. 2013. "Review of Food and Agricultural Policies in Uganda 2005-2011." Rome, Italy: FAO.
- MEMD. 2008. "National Oil and Gas Policy for Uganda." Kampala, Uganda: Ministry of Energy and Mineral Development.
- MoFPED. 2015. "Millenium Development Goals Report for Uganda 2015." Kampala, Uganda: Ministry of Finance, Planning and Economic Development.
- MoFPED. 2016. "Uganda Shilling Depreciation in FY2015/16: Can a Re-Ocurrence Be Mitigated?" Kampala, Uganda: Ministry of Finance, Planning and Economic Development.
- Mugisha, J., Diiro, G., M., Ekere, W., Langyintuo A., Mwangi, W. 2011. "Characterization of Maize Producing Households in Nakasongola and Soroti Districts in Uganda". Country Report – Uganda. Nairobi: CIMMYT.
- Muyonga, John, Juliet Tibangozeka, Julius Wambete, Joseph Bbemba, Noble Banadda, Abel Atukwase, and Florence Kiyimba. 2014. "Promoting Community and Home Based Appropriate Post Harvest Handling

and Processing of Legumes and Starchy Staples to Improve Food Security in Uganda.” Minneapolis, MN: McKnight Foundation.

Muyundo, Jane. 2010. “Logistics Capacity Assessment Uganda.” Rome, Italy: Logistics Cluster.

Nkonya, Ephraim. 2001. “Bean Marketing in Uganda: Constraints and Opportunities.” Washington, D.C.: IFPRI.

Obita, Christine. 2015. “Logistics Capacity Assessment.” Rome, Italy: Logistics Cluster.

Ojambo, H. 2012. “Decentralisation in Africa: A Critical Review of Uganda’s Experience.” Kampala, Uganda: Makerere University.

Okello, D.K., M. Biruma, and M. Deom. 2010. “Overview of Groundnuts Research in Uganda: Past, Present and Future.” *African Journal of Biotechnology* 9 (39): 6448–59.

Okobi, G., Muwanga, J. and Mwebaze, T. 2012. "Use of Improved Inputs and its Effect on Maize Yield and Profit in Uganda". *AJFAND*, Vol. 12, no. 7. Dec. 2012.

Okumu, Luke, and J.C. Okuk Nyankori. 2010. “Non-Tariff Barriers in EAC Customs Union: Implications for Trade Between Uganda and Other EAC Countries.” Kampala, Uganda: Economic Policy Research Centre.

OpenStreetMap, 2016. Road map of Uganda. <https://www.openstreetmap.org/#map=9/3.2996/34.5273>

Otim-Nape, G.W., A. Bua, G. Ssemakula, G. Acola, Y. Baguma, S. Ogwal, and R. Van der Grift. 2005. “Cassava Development in Uganda.” Rome, Italy: FAO.

Owere, Lawrence, Pangirai Tongoona, John Derera, and Nelson Wanyera. 2014. “Farmers’ Perceptions of Finger Millet Production Constraints, Varietal Preferences and Their Implications to Finger Millet Breeding in Uganda.” *Journal of Agricultural Science*, Vol. 6, No. 12: 126-138.

Stark, Jeffrey. 2011. “Climate Change and Conflict in Uganda: The Cattle Corridor and Karamoja.” Washington D.C.: USAID.

Steiner, Susan. 2006. “Decentralisation in Uganda: Exploring the Constraints for Poverty Reduction.” Working Paper Series 31. GIGA Research Programme: Transformation in the Process of Globalisation. Hamburg, German: German Institute of Global Area Studies.

Tschirley, David, Robert Myers, and Helder Zavale. 2013. “MSU/FSG Study of the Impact of WFP Local and Regional Food Aid Procurement on Markets, Households, and Food Value Chains.” East Lansing, Michigan: MSU.

UBOS. 2008. “The National Livestock Census Report 2008.” Kampala, Uganda: Uganda Bureau of Statistics.

UBOS. 2010a. “Uganda Census of Agriculture 2008/2009 Volume I Summary Report.” Kampala, Uganda: Uganda Bureau of Statistics.

----- . 2010b. “Uganda Census of Agriculture 2008/2009 Volume IV: Crop Area and Production Report.” Kampala, Uganda: Uganda Bureau of Statistics.

- UBOS. 2011. "Census of Business Establishments, 2010/11." Kampala, Uganda: Uganda Bureau of Statistics.
- UBOS. 2014a. "2014 Statistical Abstract." Kampala, Uganda: Uganda Bureau of Statistics.
- . 2014b. "The Informal Cross Border Trade Survey Report 2013." Kampala, Uganda: Uganda Bureau of Statistics.
- UBOS. 2015. "2015 Statistical Abstract." Kampala, Uganda: Uganda Bureau of Statistics.
- UBOS. 2016. "National Population and Housing Census 2014." Kampala, Uganda: Uganda Bureau of Statistics.
- UNDP. 2015. "Uganda Human Development Report 2015. Unlocking the Development Potential of Northern Uganda." New York, NY: United Nations Development Program.
- UNHCR. 2016. "Uganda - Refugees and Asylum-Seekers in Country." Washington, D.C.: United Nations High Commissioner for Refugees.
- USAID. 2009. "Uganda. USAID Humanitarian Assistance in Review, 1997-Present." Washington, D.C.: USAID.
- USGS. 2012. "A Climate Trend Analysis of Uganda." Washington, D.C.: United States Geological Survey.
- Vellema, Sietze, Giel Ton, Nina de Roo, and Jeroen van Wijk. 2013. "Value Chains, Partnerships and Development: Using Case Studies to Refine Programme Theories." *Evaluation* 19 (3): 304–20.
- World Bank. 2010. "Kenya Economic Update." Washington, D.C.: World Bank.
- World Bank. 2016. "World Development Indicators." Washington, D.C.: World Bank.
- World Bank, and MoFPED. 2015. "Economic Diversification and Growth in the Era of Oil and Volatility." Washington, D.C.: World Bank.
- World Food Program Uganda. WFP Uganda Price Database. Accessed September 1.
- WFP, and UBOS. 2013. "Comprehensive Food Security and Vulnerability Analysis." Rome, Italy: WFP.
- WTO. 2012. "Trade Policy Review: East African Community (EAC)." Rome, Italy: WTO.