FEWS NET

FAMINE EARLY WARNING SYSTEMS NETWORK

DEMOCRATIC REPUBLIC OF THE CONGO

STAPLE FOOD MARKET FUNDAMENTALS

OCTOBER 2015

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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

BEST	Bellmon Estimation Studies for Title II
BXW	Banana *Xanthomonas* Wilt
CAR	Central African Republic
CBSD	Cassava Brown Streak Disease
CDCS	Country Development Cooperation Strategy
CDF	Congolese franc
CFSVA	Crop and Food Security Vulnerability Assessment
CIF	Cost insurance freight
CMD	Cassava Mosaic Disease
CTB	Coopération Technique Belge
LCA	Logistics Capacity Assessment
DRC	Democratic Republic of the Congo
FAO	Food and Agriculture Organization of the United Nations
FAIS	Food Aid Information System
FEC	Fédération des Entreprises du Congo
FEWS NET	Famine Early Warning Systems Network
FFP	Food for Peace
FOB	Freight on board
FSTWG MAS	Food Security Technical Working Group Market Analysis Subgroup
FY	Fiscal year
GAUL	Global Administrative Unit Layers
GDP	Gross domestic product
GDRC	Government of the Democratic Republic of the Congo
ha	hectare
IDA	International Disaster Assistance
IDP	Internally displaced person
IGO	International government organization
IITA	International Institute of Tropical Agriculture
IMF	International Monetary Fund
INERA	Institut National pour les Études et la Recherche Agronomiques
kg	kilogram
km	kilometer
mm	millimeter
m^2	meter squared
MIBA	Société Minière de Bakwanga
MPSMRM	Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité
MT	metric ton
MMT	million metric tons
OCHA	Office for the Coordination of Humanitarian Affairs
OFDA	Office of Foreign Disaster Assistance
ONATRA	Office National des Transports

Acronyms and Abbreviations (continued)

PNIA	Programme National d'Investissement Agricole
RM	Remote monitoring
RRA	Rapid rural appraisal
SNCC	Société nationale des Chemins de Fer du Congo
SNSA	Service National des Statistiques Agricoles
USAID	United States Agency for International Development
US$	United States dollar
WFP	World Food Programme
ZAAP	Zones d'Aménagement Agricole Planifié

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.

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.

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.

Executive Summary

- This Market Fundamentals report for the Democratic Republic of the Congo (DRC) presents findings to inform regular market monitoring and analysis in the eastern provinces of the country. The information gathered serves as essential input to food security monitoring and analysis and can be used to support the design of food assistance programs, including but not limited to a Bellmon determination in advance of an FY 2016 USAID Title II-funded non-emergency program in the DRC.

Figure 1 Map of the DRC study area

Source: Author's estimates based on FAO GAUL (2015).

- This study is based on a desk review, fieldwork using rapid rural appraisal (RRA) techniques, and stakeholder workshops carried out during the months of April and May 2015 in priority areas first identified by USAID through the Country Development Cooperation Strategy (CDCS) paper, and further refined by Food for Peace (FFP) staff (in Kinshasa and Washington). Those priority provinces include North and South Kivu, Orientale, Katanga, and Kasaï Oriental and Kasaï Occidental (Figure 1; Annex 1).[1] Given USAID's strong interest in understanding market dynamics in a very specific area of Orientale Province (one main district was identified), the level of detail of reporting is much greater there, but is only valid for a localized area (Ituri District). The analyses for the other provinces represent larger geographic areas but offer less detail.
- Given FEWS NET's pre-existing knowledge of the important market linkages between eastern DRC and neighboring Zambia, Tanzania, Rwanda, and Uganda, complementary market analyses (desk review and RRA) were carried out by FEWS NET staff in key border crossing areas of those countries as well.[2] This work will be further complemented with an assessment and stakeholder workshop in Maniema Province during the first quarter of FY 2016.
- At the national level, the DRC is structurally deficit in staple food production. National requirements are met through a combination of local production as well as regional and international imports, although important commodity-specific and geographic differences exist. The two main locally produced staple foods in the DRC are cassava and maize. In the easternmost provinces of the DRC, locally produced dry beans, bananas, and

[1] FEWS NET staff led four stakeholder workshops, one for both North and South Kivu Provinces, one for both Kasai Oriental and Kasai Occidental Provinces, one for Orientale Province, and one for Katanga Province. Please see Annex 2 of this report for more information about the specific timing and participants of those workshops.

[2] FEWS NET staff had planned to travel to Burundi as part of this assessment, but those plans were cancelled due to local election-related tensions at the time of the assessment.

potatoes are also important food and incomes sources. Imports of milled rice and edible oil from international markets supplement local production of those commodities.

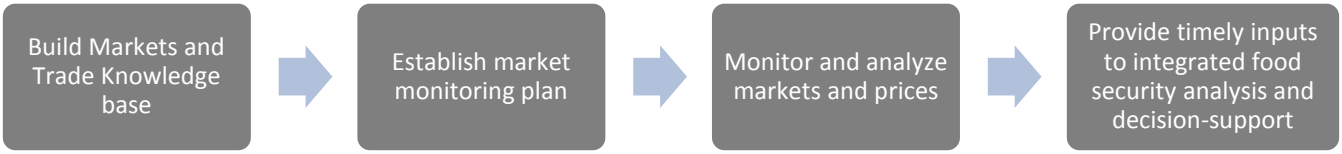
- Poor and very poor households in eastern DRC are heavily dependent on markets to meet their staple food needs. The number of months during which households are dependent on market purchases varies by livelihood zone.
- The DRC is endowed with enormous potential for agricultural production. Years of neglect to the agriculture sector and supporting services, however, not only limited incentives for the private sector to invest heavily in agriculture, but also resulted in the rampant spread of crop diseases. Nonexistent or heavily deteriorated infrastructure (roads in particular) limits the extent to which commodities are able to circulate from surplus to deficit areas of the DRC.
- This general context has resulted in disjointed marketing systems, with marketing basins in the easternmost areas of the DRC far more integrated with marketing in neighboring countries than with neighboring provinces within the country. Markets in Katanga Province are most dependent on regional markets, particularly Zambia and Tanzania. Markets in eastern Orientale Province are closely integrated with those in Uganda. Markets in North Kivu Province are integrated with those in Uganda and Rwanda. Markets in South Kivu Province are integrated with those in Rwanda, Burundi, and Tanzania. Due to their relatively isolated nature, Kasaï Oriental and Kasaï Occidental Provinces have market linkages but are not part of any particularly strong or vibrant marketing basins.
- Food availability in eastern DRC is determined by local production as well as the availability of imports from regional and international markets. Other factors that influence food availability and access (prices) include persistent civil unrest and conflict. Years of conflict and insecurity have left some of eastern DRC's most agriculturally productive areas unable to meet local food needs, including parts of Ituri District (Orientale Province), Tanganyika District (Katanga Province), Shabunda and Mwenga territories (South Kivu Province), and Walikale (North Kivu Province). The macroeconomic context since 2009 has been relatively stable, thanks to a relatively stable exchange rate, but the Congolese economy's relative dependence on mining revenues makes large variations in GDP possible, depending on global market trends.
- Cassava is the most important staple food produced in the DRC, but the distances over which dried cassava are traded are fairly limited. Maize, rice, and dry beans store more easily and are traded over the longest distances. Other locally produced commodities (groundnuts, palm oil, potatoes) are traded over short distances.
- Orientale Province has three main marketing basins for staple foods: one centered around Kisangani and involving river transport along the Congo River; one centered around Isiro; and one centered around Bunia, involving trade with the northernmost part of North Kivu Province and neighboring Uganda. Orientale Province is self-sufficient in most commodities, except rice and vegetable oil, which are mostly sourced from international markets (via Uganda).
- North and South Kivu Provinces have two to three marketing basins. The one in the northernmost part of North Kivu Province is linked with markets in southeastern Orientale Province, Uganda, Rwanda, and the southern part of North Kivu Province. One marketing basin encompasses the broad areas surrounding Lake Kivu, including the southern part of North Kivu Province (including Goma) and the northern part of South Kivu Province (including Bukavu). The eastern part of South Kivu Province that runs along Lake Tanganyika is easy to access from Bukavu given the relatively good road infrastructure. North Kivu Province is self-sufficient or produces in small surplus most locally produced staple foods, but depends on international markets (via neighboring countries) for rice supplies. South Kivu Province depends on North Kivu Province and neighboring Rwanda and Tanzania to meet local food needs.

- Katanga Province likewise has three marketing basins, with the largest quantities traded in the southernmost basin that includes the greater Lubumbashi area and markets in Zambia. This particular marketing basin is unlike any others studied in eastern DRC given the relatively good local infrastructure (roads and electricity) and relatively industrial nature of food production and processing in that part of the province. The second most dynamic marketing basin is centered on Kalemie and involves trade with Tanganyika District and Tanzania. A third marketing basin in Katanga Province is somewhat linked to markets in Kasaï Oriental Province. Katanga Province is structurally deficit in its most important staple food, maize, and imports large and increasing quantities of maize grain and maize flour from neighboring Zambia.
- Market linkages in the Kasaï Provinces are fairly weak due to the nonexistent or greatly deteriorated state of local infrastructure. Markets are relatively integrated within the territories of the Kasaïs as the distances between markets there are relatively short and the players driving these markets are essentially the same. Integration outside the provinces is extremely limited because of long distances between markets, poor roads, and the scarcity of means of transport, contributing to high transportation and transaction costs. This discourages traders from operating outside of their immediate district or territory.

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.

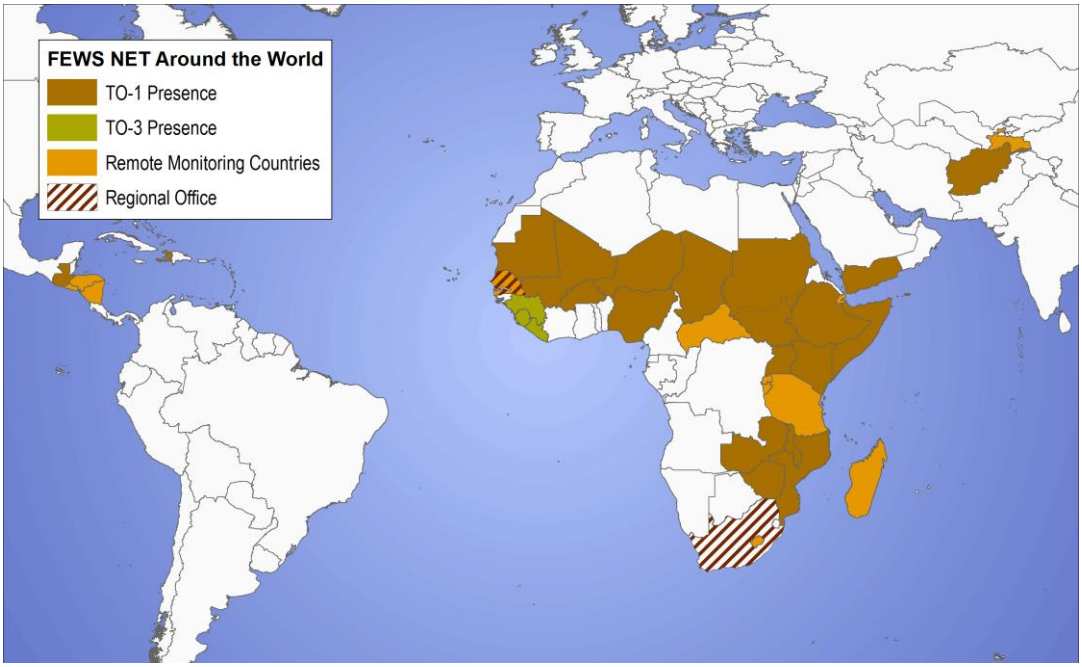
Several types of information help inform the understanding of typical market conditions that affect the food and income sources of the poor and very poor. These include: the geography of supply and demand for a particular commodity (for example, maize) or category of commodities (for example, staple 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 2014.

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 2). 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. Democratic Republic of the Congo Staple Food Market Fundamentals

1.1 Introduction

The Democratic Republic of the Congo (DRC) is dealing with the effects of nearly two decades of conflict that contribute to sporadic violence, insecurity, displacement, and political upheaval and continue to impact local and national market and trade systems, local economies, household livelihoods, and cohesive conflict recovery, particularly in the eastern provinces. Persistent conflict, politically and resource-based, continues to underpin structural and local instability in food systems on both a national and provincial level. Despite the DRC's endowment of unparalleled access to high-value resources, including minerals, fuel, and gold, political instability and poor governance continue to drive some of the lowest human development indicators in the world, including widespread severe poverty, increased import dependence for food needs, and both chronic and acute food insecurity throughout the country. While some measures of economic growth and stability have achieved gains in the last several years, these advancements in macro-policy and development are not reflected in consistent household-level economic gains. This report reviews relevant characteristics and key indicators that allow for a more comprehensive understanding of staple food markets in the DRC, with a particular emphasis on North and South Kivu, Orientale, Katanga, and Kasaï Oriental and Kasaï Occidental Provinces.[3]

The DRC's staple food marketing systems have several defining characteristics. At a national level, the DRC is structurally deficit in overall staple food availability, but net trade flows vary considerably by commodity and by locality within the country (Table 1). Given the expansive and diverse geography, a variety of agro-climatological zones and production systems exist, and often bear a closer resemblance to those in neighboring countries. While smallholder production systems play a central role in staple food production, some large-scale farming systems are in place, mostly to serve the major urban centers of Kinshasa and Lubumbashi. The poor and inconsistent quality of official government production statistics makes it difficult to quantitatively decipher interannual variations in production, whether driven by rainfall, conflict, or otherwise.[4] Other cross-cutting factors like conflict, limited government investment in the agriculture sector (direct or indirect), the poor state of national infrastructure, and varying business policies due to the process of decentralization affect production patterns, the movement of grain from surplus to deficit areas of the country, and imports from regional and international markets, with implications for both food availability and access. The effects of these issues are felt in both structurally surplus and deficit areas of the DRC.

1.2 National food supply and food supply in the eastern focus provinces

The climate has favorable implications for year-round production of agricultural commodities, including food and cash crops as well as pasture. Year-round rainfall, alternating in southern and northern areas, promotes constant cultivation of staple crops. Staple crop cultivation varies according to region, although cassava and maize are major staples grown countrywide, and most areas support some kind of livestock production. The DRC produces important quantities of other food crops, including bananas, groundnuts, rice, potatoes and other tubers (especially sweet potatoes and yams), palm, legumes (dry beans, cowpeas, and soybeans), sugarcane,

[3] In February 2015, the Congolese General Assembly voted in favor of the "*Loi de programmation N° 15/004 du 28 FEVRIER 2015 Déterminant les modalités d'installation de nouvelles provinces.*" This law sets in motion the process of transitioning from 11 to 26 provinces, commonly referred to as the "*découpage*" process, and was previously implemented in Kivu Province in the late 1980s (breaking Kivu Province into North Kivu, South Kivu, and Maniema Provinces). As the transition was ongoing at the time of writing, this report uses the previous provincial boundaries.

[4] The FEWS NET assessment team found this to be a particular challenge in gathering and then reconciling secondary data for this report. In each province visited, large discrepancies existed between the production statistics available in Kinshasa and those available in provincial offices. Delays in processing and disseminating data (over one year) make it difficult to inform policy and program decision support in a timely manner.

horticultural products, and fruits (SNSA 2012). Additionally, households may produce cash crops such as coffee, tea, and palm products. Cassava is the most important domestically produced food, and the DRC is the fifth largest producer of cassava in the world. Cassava comprises 80 percent of all food production, and is a primary food source for 70 percent of the population (Humpal, wa Mukendi, and Tunieka 2011). Bandundu, Katanga, Orientale, and Equateur Provinces account for almost two-thirds (64 percent) of national cassava production. Domestic production is complemented by commercial imports (formal and informal) from regional or international markets as well as in-kind food assistance to meet aggregate food needs. Unlike neighboring Tanzania and Zambia (among others), the DRC's food system does not rely heavily on emergency stocks and reserves of staple foods.

Food supply in Orientale, North Kivu and South Kivu, Katanga and the Kasaï Provinces broadly mirrors the national landscape, with some important differences. Cassava is among the most important staple foods produced, with Orientale Province making the greatest contribution to aggregate national supply (Annex 5; Figure 5). In nearly all provinces, local cassava needs are met through local production. Whereas the western part of the country relies on imports via the Port of Matadi, the easternmost provinces rely on imports from regional and international markets that transit via a large number of border crossing points (land or lake).[5] Of the easternmost provinces, South Kivu and Katanga Provinces are the most import-dependent to meet their food needs. Dry bean production in North Kivu Province has among the most commercial of production and marketing systems in the Kivu Provinces, while the large-scale, vertically integrated maize production systems of the greater Lubumbashi area are among the most commercial in the study focus areas.

Table 1 Commodity production status in focus provinces of the DRC

Province	Maize	Cassava	Beans	Rice	Palm Oil	Potatoes	Bananas
Orientale							
North Kivu							
South Kivu							
Kasaï Oriental						N/A	N/A
Kasaï Occidental						N/A	N/A
Katanga							

Surplus | Self-sufficient | Deficit

Source: Authors' estimates based on FEWS NET Markets and Trade Stakeholder Workshop Proceedings 2015.

[5] Milled rice and edible oil are imported from international markets to all of the eastern provinces, while regionally produced rice is imported (mostly from Tanzania) by South Kivu Province and regionally produced maize is imported (mostly from Zambia) by Katanga Province.

Figure 4 Commodity contributions to average national crop production (000s MT), 2005-2011[6]

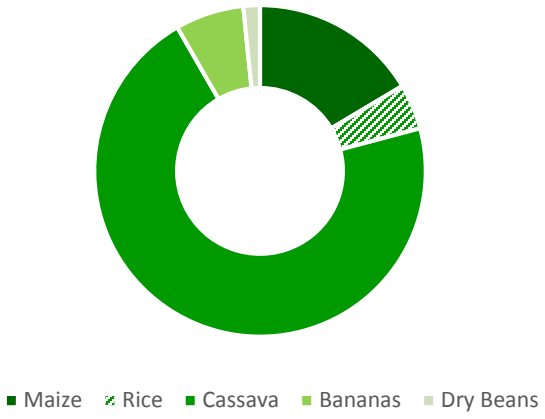


Figure 5 Average cassava production (MT), 2005-2011

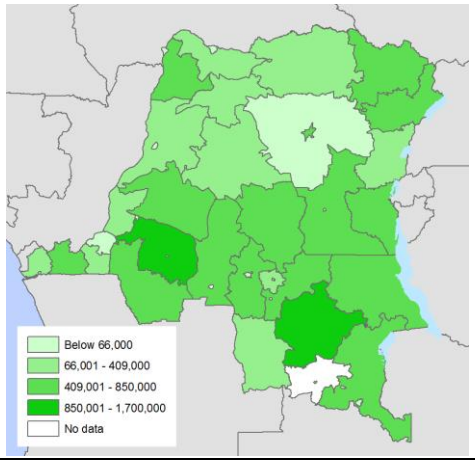


Figure 6 Average maize production (MT), 2005-2011

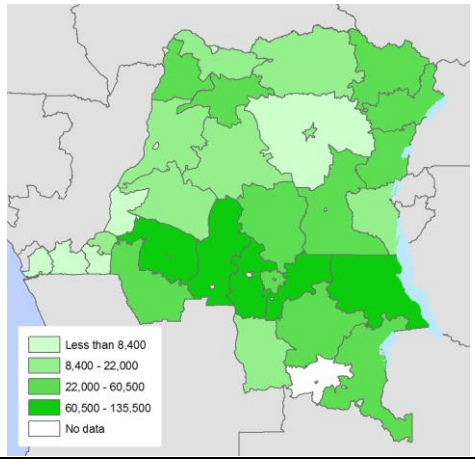


Figure 7 Average rice (paddy) production (MT), 2005-2011

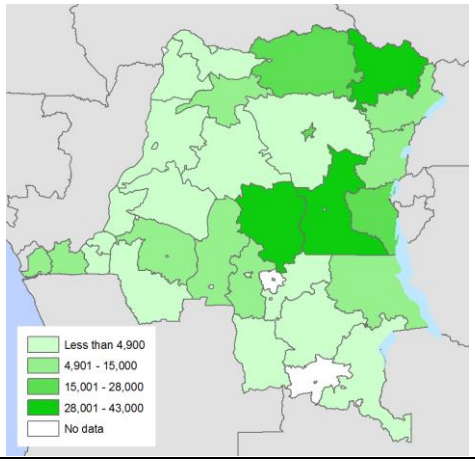


Figure 8 Average banana production (MT), 2005-2011

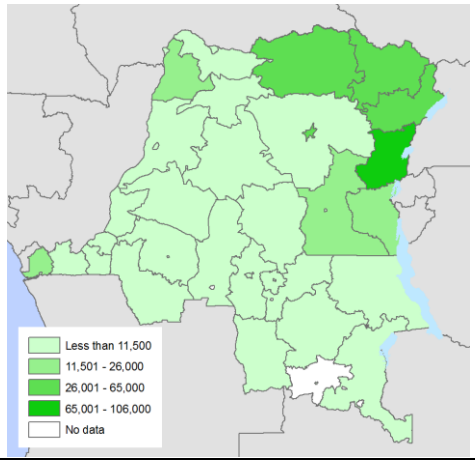
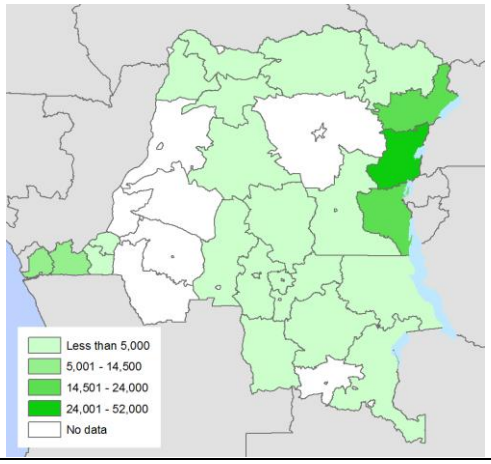


Figure 9 Average dry bean production (MT), 2005-2011



Source: Authors' calculations based on SNSA (2012).

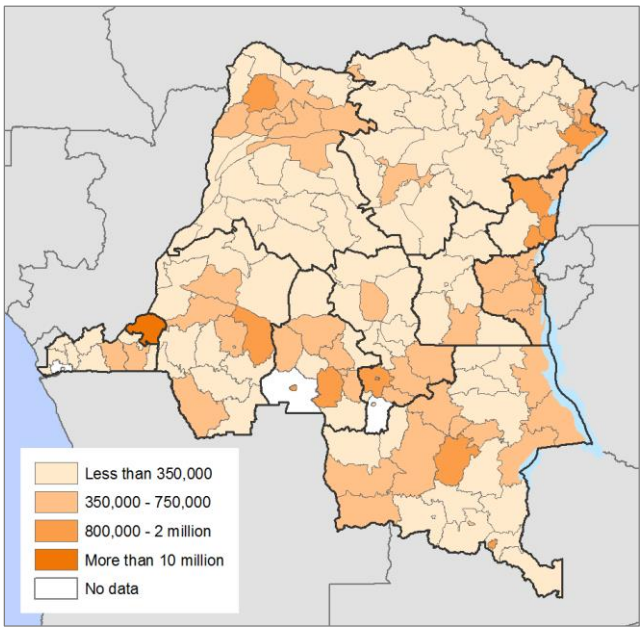
[6] Cassava is expressed in grain equivalent in this figure.

1.3 Food demand in the eastern provinces

Staple food market demand in eastern DRC consists of local household purchases, demand for the local brewing industry (maize and rice), and some urban demand from high-income areas (potatoes and dry beans in Kinshasa). Although local institutional purchases by humanitarian organizations are on the rise, the quantities purchased to date have not been sufficient to create any generalized inflationary effect.

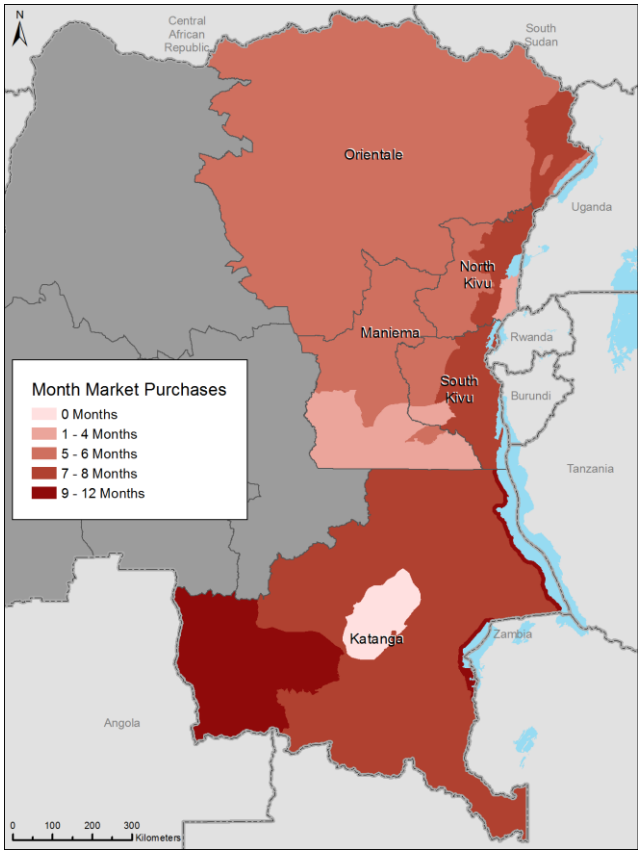
Although there are certainly provinces that are self-sufficient or surplus-producing in terms of aggregate food availability, household-level market dependence is quite high. The easternmost territories and districts of the DRC (in Orientale Province and the Kivu Provinces) are not only among the most populated (Figure 10), but households in those areas rely on market purchases to meet their food needs for most months out of the year (Figure 11). This is broadly consistent with other recent reports (Akakpo, Randriamamonjy, and Ulimwengu 2014). The specific periods when market dependence is strongest vary considerably by livelihood zone and province (FEWS NET 2015b).

Figure 10 Population by district/territory in the DRC



Source: Authors' calculations based on Akakpo, Randriamamonjy, and Ulimwengu (2014) and FEWS NET (2015a).

Figure 11 Months of market purchases by very poor households in eastern DRC



Source: Authors' calculations based on FEWS NET (2015b).

2. Cross-cutting Issues

A number of ongoing and cross-cutting issues affect nearly all aspects of the Congolese economy, including staple food marketing systems. Highly variable agro-climatic conditions, the political and macroeconomic setting, impacts of prolonged periods of conflict, and the general disjointed nature of markets and marketing systems are four of the most prominent issues affecting staple food availability and access in the DRC. When the impacts of some of the issues highlighted here differ somewhat by province or by commodity, they are discussed anew and in more detail in the sections below.

2.1 Geography and agro-climatology

The second largest country on the African continent, the DRC spans a total land area of 2.3 million km², nearly 60 percent of which comprises 125 million hectares of tropical forest, the second largest such forest in the world. Centrally located on the continent, the DRC is nearly landlocked, with the exception of 36 km of Atlantic coastline that allow for maritime commerce. Sharing extensive borders with nine surrounding countries, including Angola, Burundi, Central African Republic (CAR), Congo-Brazzaville, Rwanda, South Sudan, Tanzania, Uganda, and Zambia, the DRC is vulnerable to regional political and resource-based conflict. At the same time, the DRC's geographic location and proximity to trade partners enhance trade potential. The DRC is endowed with numerous natural resources, such as mineral wealth (including but not limited to gold and diamonds) and abundant arable land. The DRC also benefits from fresh water reserves that comprise nearly half of Africa's fresh water supply. Water bodies, including several large lakes (Tanganyika, Kivu, Edward, and Albert) and the DRC's extensive river network (which includes the Congo and various tributaries), account for 3.5 percent of the national territory and provide an estimated 12,700 km of navigable waterways for transportation, commerce, livelihoods, and drinking water. The DRC's combined water resources are equivalent to an estimated potential water resource potential of 19,967 m³/year per inhabitant (African Development Bank 2013).

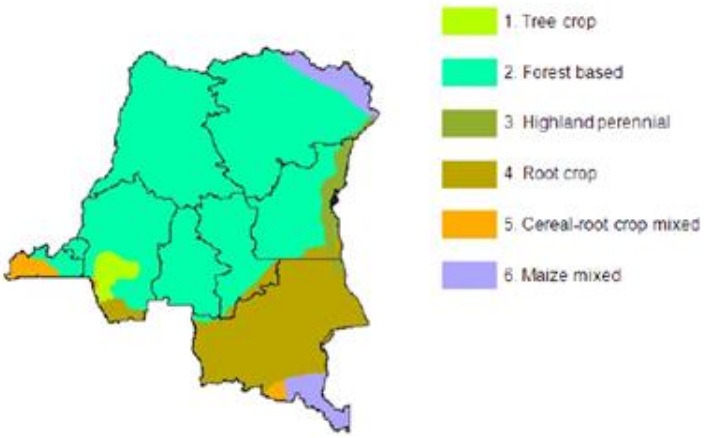
The DRC also faces significant exposure and vulnerability to both manmade and natural hazards. The eastern region of the country is located within the Eastern Rift of the Great Rift Valley, and has experienced several geologic shocks, such as the eruption of Volcanoes Nyiragongo and Nyamulagira in 2002, 2006, and 2010, as well as earthquakes in 2005 and 2008. The highly populated eastern provinces are more prone to conflict-related shocks and environmental crises (volcanic eruption, mudslides). Crop disease is a persistent threat to agricultural production in largely agrarian communities, particularly Cassava Mosaic Disease (CMD) and Banana *Xanthomonas* Wilt (BXW).

The DRC spans a vast and complex group of climate systems, with abundant rainfall that is constant in some areas, and its fertile land supports multiple agricultural cycles. Rainfall patterns in the DRC allow for two agricultural cycles in nearly 75 percent of the country. Average accumulation of rain can range from 800 to 1,800 mm according to the time of year and geographic location. Multiple agro-climatic zones and intersecting bimodal and unimodal rainfall patterns preclude generalization about rainfall and dry periods on a national level. The southern region (primarily Katanga Province) is unimodal, much like neighboring Zambia, with a six month rainy season and six months of seasonal dryness. Though climatology is complex in the DRC, similar seasonal trends are characteristic of four major climate zones. The Equatorial Zone comprises the bulk of the forested central basin that covers approximately 48 percent of national land area. The remaining climate zones include the Tropical Humid Zone, the Tropical with Extended Dry Season Zone, and the Coastal Zone. In general, the equatorial center of the country is hot and humid, and extends to a more tropical climate system northward and southward, transitioning to savanna plateaus at an elevation of 700 to 1,200 meters. Humidity begins to dissipate outside of the equatorial center, becoming cooler and drier in the southern highlands, and cooler and

wetter in the eastern highlands, which include high-altitude (1,500 to 5,000 meters) mountainous and volcanic zones that comprise the eastern region, including North and South Kivu Provinces. [7]

Agro-ecology is similarly complex in the DRC, with six key agro-ecological zones guiding livelihoods and agricultural production across the country (Figure 12). Agro-ecological zones overlap with climate zones, creating additional complexity and also agricultural potential. These zones include: the Central Basin, which consists primarily of evergreen forests; the Center South, with humid and dense evergreen forest as well as semi-deciduous forest and savannah; the East/Eastern Highlands, characterized by savannah and low- and high-altitude mountain forests (both equatorial and bamboo); the Northern Zone, characterized by plains; and the Southeast Zone, dominated by a combination of plateau and rift areas, forested areas, and grassy areas.

Figure 12 Major farming systems and crops in the DRC



Source: USAID-BEST (2010).

2.2 Agricultural production systems

The DRC has vast potential for domestic food production given its expansive and underdeveloped arable land, favorable climate and soil conditions, and a permissive agro-climatology that allows for multiple growing seasons of staple foods. However, poor regulatory frameworks, limited reach of government policies and resources, antiquated technologies, and the dominance of micro-scale subsistence farming in national food production are all limiting factors to staple food cultivation. Significant potential for agricultural production, particularly in the Eastern “bread basket” areas, is prohibited by a series of systemic and environmental constraints, including: conflict and insecurity, poor seed and input quality, small-scale production, restrictive land tenure practices, lack of credit and investment capacity, the pervasive threat of plant diseases to staple foods (especially cassava and bananas), outdated growing and cultivation practices, inability to market produce effectively, and lack of education and technical support to household-level producers.

With tremendous untapped agricultural potential, less than 10 percent of a possible 75 million hectares of suitable agricultural land are under cultivation in the DRC (MADR 2012), a contributing factor to structural national and provincial-level food deficits. About 70 percent of Congolese derive the majority of their food from subsistence-level agriculture, although domestic agricultural production contributes nearly 10 percent to the national gross domestic product (GDP) overall (Banque Centrale du Congo 2014). Agricultural production is almost entirely informal, with 90 percent of the sector driven by informal, small-scale activities. Exceptions to this national average include Equateur, Bandundu, Kasaï Occidental, and Maniema Provinces, where formal (commercial) production exceeds 10 percent of provincial yields (Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité 2014). Commercial plantation agriculture was widely practiced for cash crop production during the colonial and post-colonial period in some of the country’s most fertile areas. Today, while many plantations have either not been maintained or have been abandoned altogether (de Failly 2000; MADR 2012) the land has not been repurposed or redistributed due to unclear or weak local land tenure laws.[8]

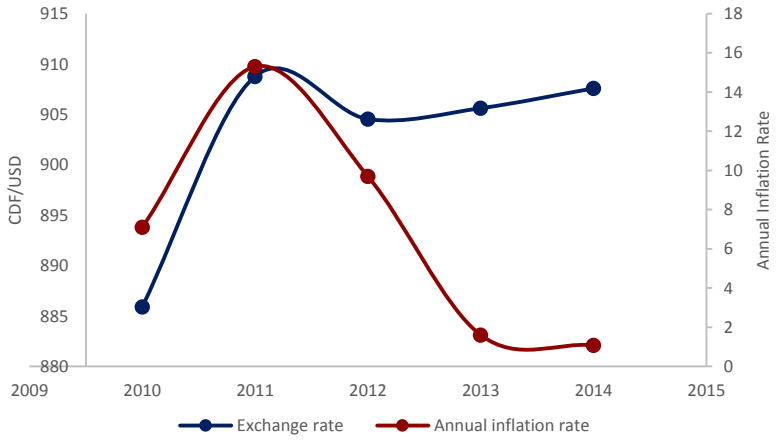
[7] Refer to Annex 4 for a breakdown of the production and marketing calendars in the focus provinces.

[8] FEWS NET Markets and Trade Stakeholder Workshop Proceedings 2015a.

2.3 Political and macroeconomic context

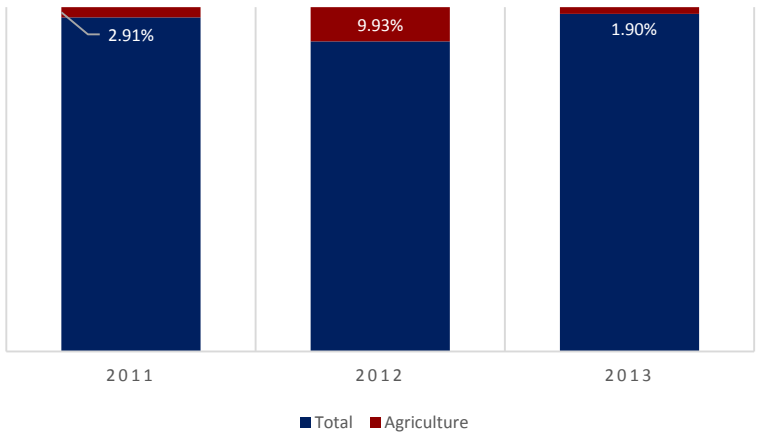
As mentioned above, although the DRC is endowed with tremendous potential for agricultural production, the macroeconomic and political climate in the DRC is not favorable for agricultural production and markets. Economic growth is reliant on the mining sector, which produces few spillover effects into other parts of the economy. The government spends very little on agriculture (2 percent of government spending in 2013), the sector of the economy most able to produce inclusive growth and reduce poverty (Figure 14). The country lacks basic infrastructure (transportation, communication, and electricity), market information systems, and agricultural extension, and land tenure laws are not favorable for small-scale producers (Development Alternatives Incorporated 2014). The private sector engaged in agricultural production and marketing is therefore hampered by a generally unsuitable business-enabling environment.

Figure 13 Congolese macroeconomic indicators, 2010-2014



Source: Authors' calculations based on Ministère des Finances (2015) and Oanda (2015).

Figure 14 Percentage of total capital expenditures of the State Budget on agriculture



Source: Authors' calculations based on Banque Centrale du Congo (2014).

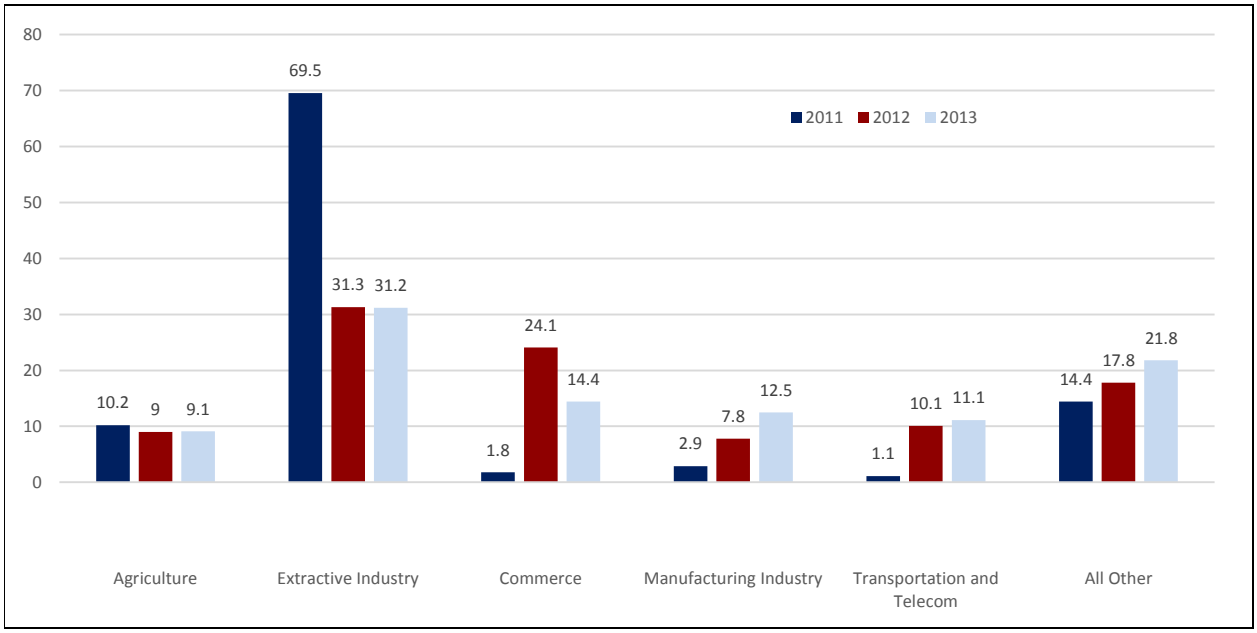
Note: This compares to roughly 17 percent of the national budget allocated to agriculture in Zambia (Government of the Republic of Zambia Ministry of Agriculture and Livestock 2013), 3-7 percent in Tanzania (Tanzania Ministry of Agriculture, Food Security and Cooperatives 2011), 10 percent in Rwanda (USAID/Rwanda 2015), and 3 percent in Uganda (Uganda Ministry of Finance, Planning and Economic Development 2013).

The process of political decentralization at its best assures that the needs of local populations are more easily known and responded to by locally elected officials. In the DRC, the process appears to have decreased the level of transparency in government funding while simultaneously creating far too many opportunities for nontransparent policy making and implementation. The associated confusion and risk discourage private sector actors from making productivity-enhancing investments.

Macroeconomic performance has been strong in the DRC. The GDP growth rate was 8.5 percent in 2013. The exchange rate has remained stable since 2010 because of the inflow of investment into the mining sector, allowing the country to maintain currency reserves (Figure 13). Inflation has remained very low and stable over the past few years, and was at 1 percent at the end of December 2013. Many indicators bode well for sustained growth in the medium term, but nearly all of them are buoyed by the mining sector. This dependence on natural resources makes the economy vulnerable to volatility and inhibits inclusive growth. The stable exchange rate may favor the import of staple foods rather than encouraging local productivity gains.

Mining constitutes the largest single sector by far in terms of contribution to GDP and mining industry products accounted for 98 percent of exports by value in 2013 (Figure 15; Banque Centrale du Congo 2014). While the mining industry is a major driver for GDP, reliance on natural resources can produce significant swings in GDP growth rates. The IMF estimated that a 40 percent decline in copper prices, for example, could result in a 4 percentage point drop in real GDP growth in the DRC (IMF 2014a). Thus, changes in global resource prices (for example, copper) could be potentially devastating to the economy.

Figure 15 Contribution to GDP by sector (%), 2011-2013



Source: Authors' calculations based on Banque Centrale du Congo (2014).

Note: "All Other" comprises public works, energy, other services, public administrative services, and taxes.

The mining sector is generally poorly integrated with the rest of the economy. One of the most prevalent signs is that while GDP has been steadily increasing, many social and poverty indicators have not improved at the same pace. The DRC ranked lowest on the 2013 United Nations Human Development Index (HDI) with a development index score of 0.304, which ties the DRC in 186th position with Niger (UNDP 2015). Mining accounts for 17 percent of formal employment but as much as 30 percent of informal employment (Oxford Policy Management 2013). The differences are significant, as the labor force for formal workers is estimated at about 300,000, while the informal workforce is estimated at about 30 million. These indicators suggest that as many as 10 million people work in informal artisanal mining. The contribution of income from mining towards essential food and nonfood purchases is small (Murphy et al. 2015). And the growth in employment in artisanal mining means that traditional livelihoods such as farming, fishing, and livestock are being threatened (Murphy et al. 2015).

Development of the agricultural sector has the strongest impact on poverty reduction compared to gains in other parts of the economy (manufacturing, services, and extractive industry) (IMF 2014b). Not only does funding for agriculture affect agricultural production but so do indirect and direct support services such as storage, infrastructure, and market information systems. In the DRC, agriculture accounts for one-half to three-quarters of household income (Murphy et al. 2015). Despite this, government spending on agriculture in the DRC was only 2 percent in 2013 (Banque Centrale du Congo 2014). As a result, farmers generally have only limited access to needed extension services and the dissemination of existing local agricultural research is often

constrained by physical access (due to poor infrastructure).[9] NGOs and international crop research centers (IITA, HarvestPlus, among others) have partially filled this void, but in a piecemeal and arguably unsustainable manner. This model is not well equipped to handle widespread challenges, such as easily transmitted and pervasive crop diseases that are believed to have had a major impact on production of bananas and cassava in eastern DRC in recent times. Private and government-sponsored storage facilities are largely located in major urban centers and ports of entry (land or water). Thus producers cannot retain their harvest in conditions acceptable for sale gradually over the course of the marketing year. Farmers in surplus-producing areas often sell what they can during the immediate post-harvest period or risk having their goods spoil.

The government's National Agricultural Investment Plan (PNIA) includes more funding for extension services and other needed agricultural inputs. Several factors inhibit the government's ability to bolster the agriculture sector in a broad sense, though, many of which stem from ongoing debates about the *Loi Agricole* and the decentralization process, among others (DAI 2014). Efforts under the national agricultural investment strategy to develop modern agricultural centers (*Zones d'Aménagement Agricole Planifié* -- ZAAP) have had some success in investing in large-scale commercial agriculture serving the nation's largest consumption centers (Kinshasa and Lubumbashi) (Ministère de l'Agriculture et du Développement Rural 2012). To date, only limited impacts on production systems are believed to have arisen, predominantly involving small-scale producers.

2.4 Gender and markets

In general, gender divisions are present within staple food marketing systems across the DRC. Women are heavily involved in local agricultural production and play a key role as rural collectors and assemblers and as retailers, with intermediate wholesaling and processing carried out by men (Mbwika, Koko, and Mvuangi 2001; Humpal, wa Mukendi, and Tunieka 2011). For example, across North and South Kivu Provinces, women can be seen carrying extremely heavy loads of agricultural produce (including dried cassava, beans, maize, among others) strapped to their heads across the hilly terrain. Women's groups often join together to pool resources to help with marketing and marketing costs (WFP and FAO 2011). Men dominate the processing sector, be it at the artisanal or industrial level. Indeed, village-level mills are typically owned and operated by men. Maize and dried cassava milling are generally provided by men as a paid service to small-scale women traders or trader groups. These gender roles are very clear during weekly markets where women are the dominant retailers, while wholesale trade is mainly carried out by men. Men are also most involved in potentially more lucrative trading activities, like wood, livestock (including butchers), and imported manufactured goods and clothing. Women are generally engaged in smaller-scale and shorter distance trade, while men dominate trade of goods in bulk and over particularly large distances. Due to the structure of these marketing systems, this division also implies that women are mostly involved in smaller-scale, informal cross-border trade, while men are involved in formal trade flows involving broader regional or international markets in border areas like Goma, Bukavu, Uvira, Bunia, Kalemie, and Kasumbalesa (Brenton et al. 2011).

2.5 Conflict and markets

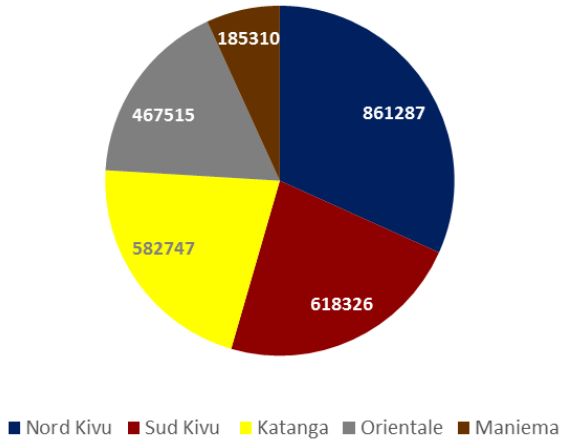
Widespread internal displacement in the eastern provinces as a result of decades of instability, political conflict, armed violence, and natural disasters has driven an estimated 2.7 million people from their homes of origin, in most cases, multiple times, to different locations throughout the country. Over half of those displaced

[9] This is in part due to very poor infrastructure. For example, the INERA research station in South Kivu has a mandate to support improved agricultural production in both North and South Kivu. However, the ability of INERA to play this role across both provinces is constrained by the relative isolation of its research facilities (approximately one hour north-west of Bukavu). A similar dynamic exists in the Kasaï Provinces, whereby the research station is located in Kasaï Oriental, but due to infrastructure constraints (poor roads), has difficulties supporting production systems in Kasaï Occidental.

populations are located in North and South Kivu Provinces (Figure 16); which are also among the highest recipients of emergency food aid. The burden of displaced populations on host communities, where internally displaced persons (IDPs) reside in homes, established camps, and informal settlements, impacts food access, livelihood stability, economic growth, and social cohesion for both displaced and host communities.

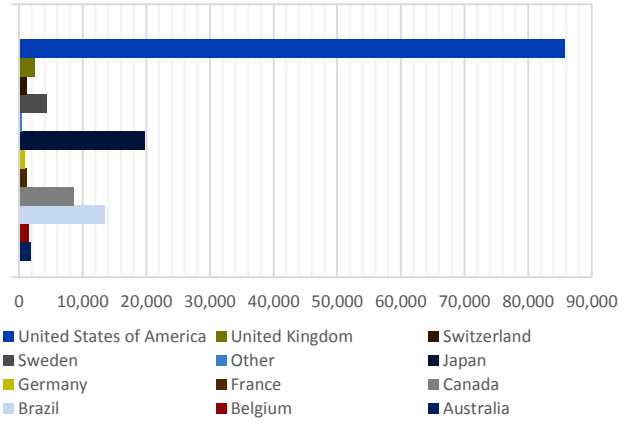
The frequency and duration of displacement prevent long-term establishment and maintenance of livelihoods (including agricultural production), access to food, consistent availability of food, and income-earning opportunities. Displacement from the Kivu Provinces to Orientale Province and to/within Katanga Province disrupts livelihoods, food access (to own production and to markets), and market supply and access, and contributes to price fluctuations. Continued sporadic conflict since late 2011 in Katanga Province, where resurgence of armed groups is frequent and ongoing, continues to push displacement, resulting in decreasing food security and increasing malnutrition (WFP and INS 2012). Mobile populations are often unable to access markets, which frequently are not reachable due to insecurity or threat of harm, theft, or violence. Price volatility in conflict areas is also a factor impacting access to food among displaced households (EMMA, WFP, and OXFAM 2013).

Figure 16 DRC displaced populations as of September 2014



Source: Authors' calculations based on OCHA DR Congo (2014).

Figure 17 Food assistance to the DRC by source country, 2012



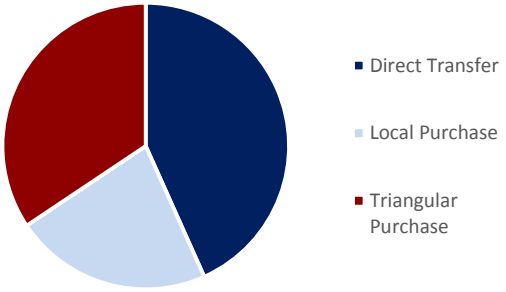
Source: World Food Programme Food Aid Information System Database 2015.

In mid-2012, staple food marketing systems in eastern DRC were heavily disrupted.[10] Since 2012, the effects of active conflict have been much more localized as the nature of the conflict has evolved and as market actors have adapted to the situation. The historically highly productive areas of Ituri District (Orientale Province), Tanganyika District (Katanga Province), Shabunda and Mwenga territories (South Kivu Province), and Walikale District (North Kivu Province) have incurred long-lasting impacts, however. Although quantitative estimates or impacts are not available, key informants indicated that agricultural production has declined substantially in these specific areas due to a combination of factors, all linked to conflict and displacement. These include household displacement, which limits agricultural production opportunities, and insecurity, which limits the distance from home that producers are willing to cultivate land (up to 5 km is typically the distance cited, roughly a one-hour walk). Furthermore, households in those same

[10] Focus-group discussions with traders in Goma indicated that during the events of early to mid-2012, the staple food marketing systems in and around Goma more or less came to a halt because of the conflict and insecurity. This had broader implications because of Goma's role as a key transit point between North and South Kivu and for trade flows with neighboring countries. Since that time, there have not been comparable disruptions to the broader marketing system, although conflict and insecurity continue to displace households and negatively affect production and marketing activities in affected areas.

areas are believed to have shifted increasingly more into artisanal mining, an activity they can participate in even when displaced.

Figure 18 Food assistance to the DRC by type/mode, 2012

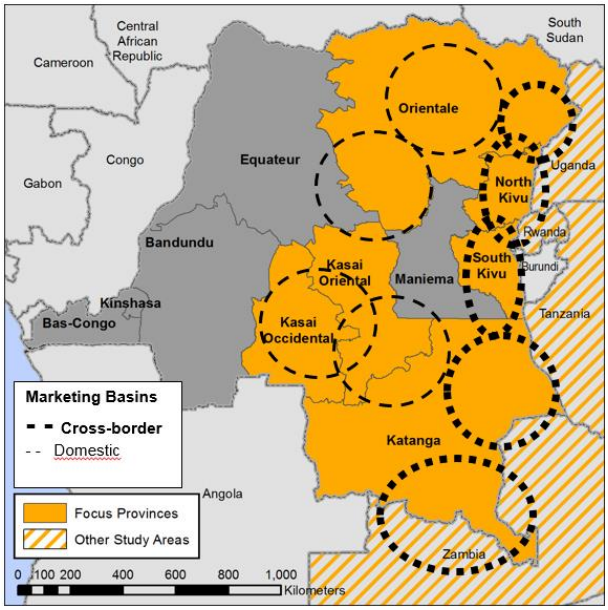


Source: World Food Programme Food Aid Information System Database (2015).

The DRC has become institutionally dependent on humanitarian assistance, and particularly food assistance, to support conflict-affected populations, especially in the eastern provinces. Currently, 7 million people are described as food insecure in the DRC (USAID/OFDA 2015b). In 2012, the DRC received US$464 million in international humanitarian assistance, making it the eighth largest recipient in that year, maintaining a place in the top ten global recipients of humanitarian assistance in nine of the last ten years (Global Humanitarian Assistance 2015). During that year, the United States was by far the largest donor of food assistance in the DRC (Figure 17). Humanitarian assistance peaked in 2013 at US$736 million, when the DRC was the fifth largest recipient of humanitarian assistance (Global Humanitarian Assistance 2015). Since 2010, USAID food assistance has averaged 31,023 MT per year, and totaled 155,160 MT. A review of food assistance data suggests that maize meal is the most significant commodity, followed by rice and corn soya blend (World Food Program Food Aid Information System database 2015).[11] The most important non-cereal assistance commodities include beans and peas, which make up the majority of non-cereal assistance, followed by vegetable oil and sugar. In 2012, the majority of in-kind commodities distributed in the DRC were sourced via direct transfer (Figure 18), from the United States in particular, although other modalities are increasingly being used, including but not limited to vouchers and cash transfers. For example, in 2015, leveraging food aid reform, FFP pursued more flexible, efficient, and effective programming that enabled partners to respond more flexibly in terms of geography, modality, and type of intervention. FFP contributed 5,680 MT in Title II development assistance in that year. In 2015, in addition to 19,490 MT in Emergency Title II assistance, FFP contributed US$28.8 million in International Disaster Assistance (IDA) resources to local and regional procurement, cash and voucher transfers, and special operations to strengthen coordination and humanitarian access to food security actors. This is up from approximately US$12 million in contributions from FFP to IDA resources for similar activities in 2014.

[11] It is worth noting that these figures are aggregated for the entire DRC. Rice has only been distributed to refugees from the Central African Republic (CAR) and is not used in the eastern provinces of the DRC.

Figure 19 Marketing basins in the eastern DRC



Source: FEWS NET Markets and Trade Stakeholder Workshop Proceedings 2015.

2.6 Disjointed marketing systems

The context described in the preceding sections has contributed to highly disjointed marketing systems in the DRC. Indeed, many areas of eastern DRC are far more integrated with markets in neighboring countries (and associated local infrastructure, in particular).

Marketing basins in the interior of the country are largely self-sufficient and engage in only limited trade with neighboring provinces due to difficulties in physically transporting goods from surplus to deficit areas and the high associated costs. This has resulted in a number of highly localized marketing basins (Figure 19).

3. North and South Kivu Provinces

- A wide variety of staple foods are produced and consumed in North and South Kivu Provinces. Mirroring the national trends (Table 2), cassava is generally the main staple food, followed by cooking bananas, maize, potatoes (as well as sweet potatoes and yams), rice (local and imported), dry beans (mixed, green, red, and brown, among others), and vegetable oil (local palm oil and imported refined vegetable oil). With the diversity of agro-climatic zones and timing of seasons (Annex 4), harvests are underway somewhere in the two provinces at nearly all times.

Figure 20 Map of North and South Kivu Provinces

Source: Author's estimates based on FAO GAUL (2015).

- Of the two provinces, agricultural production today is greatest (by volume) in North Kivu Province (Figure 5 - Figure 9; Table 2). Markets and trade flows for locally produced commodities are much more dynamic in North Kivu Province as well (both within the province and in terms of linkages with neighboring countries and provinces). Market linkages between the eastern part of South Kivu Province and regional markets, via neighboring countries along Lake Tanganyika (Burundi and Tanzania) are likewise very strong. This is supported by the availability of lake transportation and relatively better roads (discussed below). The "*petit nord*" part of North Kivu Province (encompassing the areas of Goma, Masisi, Rutshuru) supplies the northern and central parts of South Kivu Province with a wide variety of products including cassava (dried), dry beans, and potatoes. Therefore, while North Kivu Province is self-sufficient or structurally surplus in a number of goods, South Kivu Province is structurally deficit in nearly all staple foods (Bucekuderhwa 2005; de Failly 2000; FEWS NET 2015b; Njingulala and Bahati 2013).[12]

- Cross-border trade flows and the extent of market integration with neighboring countries vary considerably by commodity. Aside from internationally sourced refined vegetable oil and rice (transiting via Mombasa or Dar es Salaam), there are not extensive examples of particularly long distance and large volume trade flows for locally/regionally produced staple foods between the DRC and neighboring countries. Cross-border market integration is therefore strongest in the border areas of the DRC. Regional trade flows with neighboring Uganda, Rwanda, Burundi, and Tanzania are characterized by a high degree of seasonality for most products, resulting in some variation in the intensity and direction of trade flows throughout the year.

[12] The FEWS NET assessment team found anecdotal evidence of a number of contributing factors to the current status of staple food production in South Kivu Province. First, production has been affected by prolonged periods of conflict and insecurity coupled with increased opportunities for artisanal mining in some of the areas that were historically most productive (Shabunda, Walungu). Second, areas that were historically used by large plantation owners to grow cash crops (tea in Mwenga; cotton in Uvira) appear to be currently underutilized due to a number of challenges that largely emanate from the interpretation and application of local land tenure laws.

- Given the diversity of local production (in terms of both the crops produced and timing of harvests) and linkages with equally diverse regional markets, provincial-level food availability is generally not a concern in either North or South Kivu Province. Indeed, most important staple foods (cassava and bananas) are produced and harvested year-round both in the DRC and in neighboring Uganda and Rwanda. Territory-level availability constraints exist in some of the more geographically isolated areas, however, where a combination of factors compromises local agricultural productivity and trade flows from surplus areas of the country and region.

Table 2 Sources of commodity supply in North and South Kivu Provinces (MT) [(a)(b)]

		Cassava	Maize	Dry beans	Palm Oil [(c)]	Milled rice [(d)(e)]	Banana	Potatoes
North Kivu	Local production	326,451	45,115	52,425	5,000	30,000	106,447	72,908
	Imports	25,000	10,000	10,000	3,000	20,000	5,000	4,000
	Other DRC supply	0	0	0	0	0	0	0
	Total Supply	351,451	55,115	62,425	8,000	50,000	111,447	76,908
		Cassava	Maize	Dry beans	Palm Oil [(c)]	Milled rice [(d)(e)]	Banana	Potatoes
South Kivu	Local production	579,655	15,826	24,749	1,400	10,407	15,867	15,792
	Imports	15,000	8,000	100	10,000	41,630	0	0
	Other DRC supply	10,000	2,000	8,000	0	0	0	2,000
	Total Supply	604,655	25,826	32,849	11,400	52,037	15,867	17,792

Note:
(a) Local production based on average 2005-2011 data unless otherwise specified.
(b) Imports are from international or regional markets, from or via Uganda, Rwanda, and Tanzania.
(c) Assumes a crushing rate of 10% (AGRER 2006).
(d) Milled rice assumes a milling rate of 65%.
(e) Imports of milled rice include both formal rice flows from international markets that transit through Uganda, Rwanda, and Tanzania, as well as rice produced in Tanzania (preferred by many consumers in South Kivu).

Source: Authors' calculation based on SNSA (2012), FAO STAT (2015), AGRER (2006); FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015); OCC (2015); FSTWG MAS (2015).

- The majority of staple foods are produced by small-scale farmers who either own small parcels of land or engage in a rental and/or sharecropping scheme with large landowners (those with official titles to the land) or local traditional leaders (Akakpo, Randriamamonjy, and Ulimwengu 2014). Across the two provinces, the large majority of households cultivate less than 2.0 hectares, which is only slightly lower than the national average of 2.5 ha (Akakpo, Randriamamonjy, and Ulimwengu 2014; WFP and FAO 2013).[13] The particularities of land access schemes vary by location.[14]
- Roads along many major corridors in North Kivu Province are in a state of disrepair, which worsens during the main rainy seasons. Transporting goods within North and South Kivu Provinces using motorized vehicles is thus difficult and expensive. The two provinces contain less than 5 percent of the national road network, including paved and unpaved roads (*Observatoire National des Transports* 2011). The national railway is not functional in the Kivu Provinces and is not used for transporting goods or people. Commodities are often transported on foot or by bicycle from small rural villages to larger market centers. In general, the infrastructure (roads and lake port facilities) are in better condition in South Kivu Province, a carryover effect of the time when Bukavu was the provincial capital of Kivu Province.[15] The majority of commodity transport between market centers is carried out by relatively small trucks (called "FUSOs," after the brand

[13] Vwima, Mastaki, and Lebailly (2012) estimate that in South Kivu Province, the average area cultivated is closer to 0.5 ha per household.

[14] *Kalinzi* near Bukavu (South Kivu Province), *Kishoka* in Rutshuru and Masisi (North Kivu Province), *Ngemo* in Lubero and Beni (North Kivu Province).

[15] Kivu Province was the first to undergo the decoupage process that was finalized in 2015. In 1988, Kivu Province was broken into North Kivu, South Kivu, and Maniema Provinces.

name), which are designed to haul 4-8 MT, but are often redesigned/reinforced to haul up to 10-12 MT or more. Roads in parts of South Kivu Province (linking the lake port of Uvira with Bukavu via Rwanda or via the national road) are in better condition and support trucks with heavier loads (10-20 MT). Trade flows between North and South Kivu Province are greatly facilitated by the option of transporting goods via Lake Kivu, although it is worthwhile to note that the lake port infrastructure in Bukavu is much better developed than that of Goma.

Table 3 Average agricultural production (kg) per capita in North and South Kivu Provinces, 2006-2011 [(a)]

Province/District	Maize	Rice [(b)]	Cassava	Banana	Dry Beans	Edible Oil [(c)]
North Kivu	11.28	2.88	81.60	26.61	13.11	0.0030
Beni	20.25	11.93	430.77	84.00	32.36	N/A
Lubero	12.10	2.55	55.37	20.96	9.97	N/A
Masisi	10.22	0.21	39.90	11.77	16.17	N/A
Rutshuru	11.67	0.17	37.98	16.16	11.71	N/A
Walikale [(d)]	4.19	12.08	61.79	75.28	3.81	N/A
South Kivu	3.20	5.25	117.33	3.21	5.07	0.0028
Fizi	2.75	2.14	41.52	1.50	2.19	N/A
Idjwi	9.85	N/A	302.97	7.41	14.68	N/A
Kabare	1.70	N/A	36.33	0.96	5.61	N/A
Kalehe	6.68	1.22	364.48	9.74	9.31	N/A
Mwenga	1.91	1.92	122.05	3.26	1.05	N/A
Uvira	1.07	5.42	104.25	5.46	5.22	N/A
Walungu	2.89	0.17	120.82	0.51	10.91	N/A
Shabunda	8.66	40.60	131.31	5.44	0.21	N/A

Note: (a) Province-level per capita averages were calculated based on the entire provincial population; district-level per capita averages were calculated after excluding urban populations in the district as many urban centers comprise distinct districts with near-zero production.
(b) Paddy rice.
(c) Production data only available at the province level.
(d) The production estimates and production per capita in the mining territories of Walikale, Mwenga, and Shabunda are believed to be very outdated, particularly concerning rice production.

Source: Authors' calculations based on SNSA (2012), Akakpo, Randriamamonjy, and Ulimwengu (2014), and FEWS NET (2015a).

Table 4 Ranking of commodities consumed, in order of importance, by territory in North Kivu Province

Product/Territory	Beni	Lubero	Masisi	Rutshuru	Goma	Walikale
Cassava	1	1	1	2	1	1
Maize grain/flour	3	6	4	4	2	6
Beans	5	5	3	5	3	5
Bananas	4	4	5	1	5	3
Rice-local	2	3	6	6	7	2
Rice-imported	7	7	7	7	4	7
Irish potatoes/ Sweet potatoes	6	2	2	3	6	4

Legend: 1= Most important, 7 = least important, N/A = not consumed or limited consumption.

Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Table 5 Ranking of commodities consumed, in order of importance, by territory in South Kivu Province

Product/Territory	Kabare	Kalehe	Bukavu	Walungu	Mwenga	Shabunda	Uvira	Fizi
Cassava	1	1	1	1	1	1	1	1
Maize grain/flour	5	4	2	5	N/A	N/A	2	2
Beans	3	3	3	2	3	5	3	3
Bananas	2	2	5	4	2	3	N/A	N/A
Rice-local	4	6	8	7	5	2	6[(a)]	6
Peanuts	7	7	7	8	6	6	5	4
Rice-imported	4	8	4	6	4	4	4	5
Irish potatoes/ Sweet potatoes	6	5[(b)]	6	N/A	N/A	N/A	N/A	N/A

Legend: Rank 1= Most important, 8 = least important, N/A = not consumed or limited consumption.
Note: (a) Local rice in Uvira (in the Plaine de la Ruzizi) is produced more as a cash crop.
(b) More important in the highlands (*haut plateau*) areas of the territory.

Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

- Storage opportunities and facilities are largely limited to the main urban centers of the two provinces, which are also important border crossing points (Annex 6). In more rural and isolated areas, NGOs have their own storage facilities that are connected to or in close proximity to project offices.
- Despite the challenges associated with the local transport sector and local infrastructure, the private sector (traders, transporters, retailers) finds ways to circulate goods within the two provinces. As a general rule, although integration of markets within and between the Kivu Provinces is quite strong, integration of locally produced dry beans, potatoes, maize, and rice with neighboring provinces and the rest of the country is quite limited. Exceptions to this general rule include:
    - Dry bean (green) and Irish potato trade flows between North Kivu Province and Orientale Province (southern territories) that continue on, to a much lesser extent, to Kinshasa (via road until Kisangani and then by boat along the Congo River from Kisangani to Kinshasa). There are reports of limited quantities of Irish potatoes being flown from Goma to Kinshasa because of their very high demand and value among consumers in Kinshasa (particularly among the military population and the urban elite). However the transportation costs involved with domestic marketing via air freight are understandably quite high.[16]
    - Maize trade flows between the surplus-producing area of northern Katanga Province to Uvira (via Moba on Lake Tanganika and via road transiting through Fizi).
    - Rice trade flows, in limited quantities, from Maniema toward Walikale (North Kivu Province). Local rice trade flows also exist between the northernmost territories of North Kivu Province (for example, Beni) and the neighboring southeastern districts of Orientale Province (for example, Ituri).
- Markets for locally produced and traded staple foods are generally competitive, with a large number of buyers and sellers of any given commodity during any given day. Local producers and marketing associations and the Fédération des Entreprises du Congo (FEC) play important roles in staple food marketing, although they are not in a position to exert market power as either buyers or sellers.
- Internationally imported rice (milled, long grain) and refined vegetable oil are imported by a small number of relatively larger importers (Datcho, Kotecha, among others) with strong ties to regional and international commodity markets and the financial resources to do so. Many of these firms are also involved in imports of other items, including nonfood items (for example, paper, motor oil, personal motor vehicles,

[16] In June 2009, it cost US$0.90/kg to air freight dry beans from Goma to Kinshasa, just slightly under the FOB price in Goma of US$0.95/kg (Logistics Cluster 2009).

pharmaceuticals). Despite their small numbers, these markets operate in a relatively competitive manner that is assured through official arrangements with the government to ensure the steady flow of imports/availability of essential goods (*denrées de premier necessité*) at prices that are considered both fair to commercial traders and affordable for consumers. The FEC plays an important role in these discussions and negotiations.

- In both North and South Kivu Provinces, the majority of electricity is assured via a dated grid linked to a hydro-electric damn along the Ruzizi River. The electricity produced is shared by the DRC, Rwanda, and Burundi. In the DRC, the electrical lines pass from Bukavu to Goma, so any electrical outages in Bukavu (South Kivu Province) are also felt in Goma (North Kivu Province). The local modern food processing (milling) sector is limited given its heavy reliance on a steady and cost-effective power source. Assuring that inputs meet generally standard quality standards is likewise difficult on a large or industrial scale:
    - Cassava is milled entirely using small-scale, diesel-powered mills. The quality of cassava chips used as inputs varies widely and often contains various forms of impurities (including the dried peel, stems, and mold).
    - Maize and local rice milling is done via both small-scale, diesel-powered mills as well as some larger-scale industrial milling.
    - Traders interviewed in both Goma and Bukavu reported regularly purchasing maize and cassava flour from Rwanda (and previously as far as Uganda), where the milling capacity is higher and processing facilities are relatively more advanced (largely due to more stable access to electricity), resulting in a higher-quality flour that is appreciated by urban consumers. It is generally believed that Congolese primary commodities (maize grain and cassava chips) are often exported to border areas of Rwanda for processing during the post-harvest period and then imported as flour when local stocks decline during the lean season.
- Three territories of North and South Kivu Provinces are among the least dynamic in terms of market activities: Shabunda (South Kivu Province), Walikale (North Kivu Province), and western Mwenga (South Kivu Province). These are areas where mining activities and displacement/population movements are most intensive and are likewise areas where production per capita relatively lower (Table 3), resulting in some of the thinnest staple food markets. These territories also happen to be relatively more isolated geographically from local marketing basins due to poorly maintained feeder roads, resulting in very high transportation costs.
    - Mining activities have had a substantial impact on agricultural activities, resulting in very limited local agricultural production in areas that in the past had substantial agricultural production opportunities. Agricultural production has been greatly compromised in areas characterized by persistent conflict and population movement, as households face difficulties cultivating land farther and farther from their respective homesteads. Even market activities in those two provinces are limited in many areas, and confined mostly to mining areas. Mining populations in Shabunda, Mwenga, and Walikale are much more oriented towards manufactured/imported commodities rather than traditional staple foods, presumably things that can store easily, that do not depend on limited local production, and that can be prepared quickly (especially if men are in mining areas alone, without women around to help with food preparation).
    - In Shabunda, foodstuffs are often flown in because the roads linked to Walungu and Mwenga are in a state of disarray (ACTED 2013; WFP 2014). An example cited recently was that an in-kind delivery in South Kivu Province was supposed to take one week to travel from Bukavu to Shabunda (logistics supplied by WFP and on-the-ground distributions by World Vision). Due to the status of the roads, transportation took between three and four weeks. The alternative is to fly goods in, an extremely costly

alternative. In other areas, some local commodities may be sourced from Maniema Province, but they are generally not traded in large quantities. This overall situation has resulted in very limited local demand and supply for traditional staple foods, and very limited regular market activities, even for imported commodities.

- Despite the presence of BXW, CMD, and cassava brown streak disease (CBSD) (among others) and their devastating effects on production/yields, locally produced and imported commodities are diverse enough that aggregate staple food market supplies are generally adequate to meet local needs. Prior to the outbreak of BXW, households considered bananas a steady source of income, often used to meet urgent or pressing cash needs. Given the effects of BXW on production/yields, its presence has had a much more important impact on food access (via household income sources) than food availability. Although households can certainly grow other commodities (as seen in the transition from bananas to Irish potatoes in Rhutshuru), there is a general sense that household revenues are not as high as they once were.
- The major structural and cross-cutting issues that currently limit/impede increased agricultural production in North and South Kivu Provinces generally hold elsewhere and include a lack of coordinated and persistent support to the agriculture sector and secure land access. These broad issues affect agricultural production in a number of ways. The Ministry of Agriculture employs local agricultural inspectors and local extension agents, but limited government funds are available for multiplying, promoting, and following the adoption and use of improved seeds varieties developed by the INERA satellite located in South Kivu Province. The majority of this research is financed by international projects/organizations with an unclear degree of coordination with local Ministry of Agriculture agents. Local improved techniques have been developed to combat plant diseases such as BXW, but its eradication cannot be done in a piecemeal fashion given how easily it can spread from one plant to the next (often via a farmer's machete). However, the NGO/ international government organization (IGO) community has largely been involved in identifying and rolling out eradication measures in this fashion, an approach that has been deemed largely ineffective. The general sentiment from all individuals interviewed is that a concerted approach supported and sustained by the Congolese government (much like the approach previously taken in neighboring countries) is the only way to rid the country of the disease entirely.
    - Incentives to invest in agricultural land in North and South Kivu Provinces are fairly limited due to existing land tenure arrangements. Those who rent land from more or less absent landowners (a surprisingly common practice) understandably have little incentive to improve soil fertility, erosion, and other issues, due to the lack of tenure security (de Failly 2000). Perhaps one of the most obvious implications is that in the highly mountainous North Kivu Province, very limited terracing is used to contain soil erosion, whereas in bordering Rwanda, nearly all hillsides are terraced.

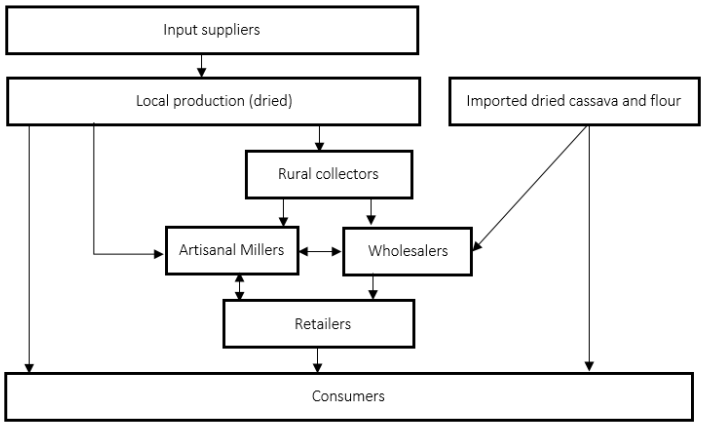
3.1 Cassava markets in North and South Kivu

Cassava is the most important crop produced and consumed in both North and South Kivu Provinces.

North Kivu Province is generally self-sufficient or produces a slight surplus of cassava, while South Kivu Province imports from both the "*petit nord*" of North Kivu Province and neighboring Rwanda (Table 2).[18] The main surplus-producing territories include Beni, Lubero, and Rhutshuru in North Kivu Province and Kalehe and Fizi in South Kivu Province. Trade flows for cassava are largely oriented toward the larger consumption centers of Goma and Bukavu, with the former playing a transit point for trade between the two provinces (Figure 25).

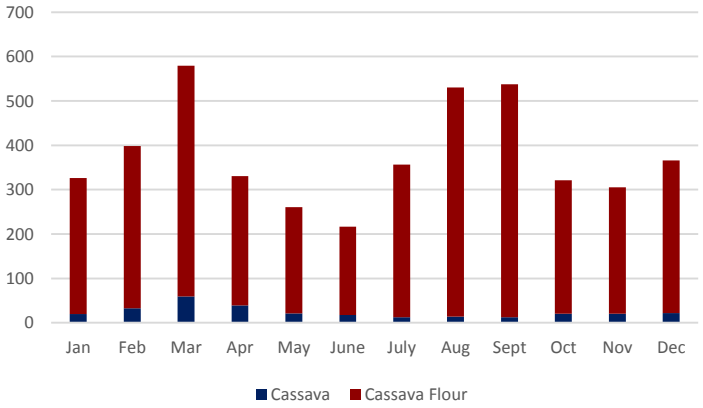
The marketing channels for cassava are fairly short (Figure 21). Cassava is mostly grown by small-scale producers. Once harvested, it is dried at either the household or rural collector level and sold as "*cosette de manioc.*" The majority of rural collectors are women, who often transport over 100-kg bags of dried cassava on foot from surplus to deficit areas. Cassava can be harvested year-round, making it an important substitute when other commodities are not as readily available. Cassava is stored either in the ground or in dried form and processed into flour prior to consumption. Cassava is mostly processed using small-scale, diesel-powered mills in both rural and urban areas.

Figure 21 Cassava marketing in North and South Kivu Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Figure 22 Average monthly informal cassava imports (MT) from Rwanda, 2012-2014[17]



Source: Food Security Technical Working Group Market Analysis Subgroup (FSTWG MAS) database, 2015.

Finely milled cassava flour is likewise imported from Rwanda and largely destined for consumers in urban Bukavu and Goma and the surrounding communities. The seasonality of imports depend on the timing of production and market demand, peaking, on average, in March and September (Figure 22). The Kivu Provinces also export small quantities of dried cassava to neighboring Ugandan, Rwanda, Burundi, and Tanzania (Figure

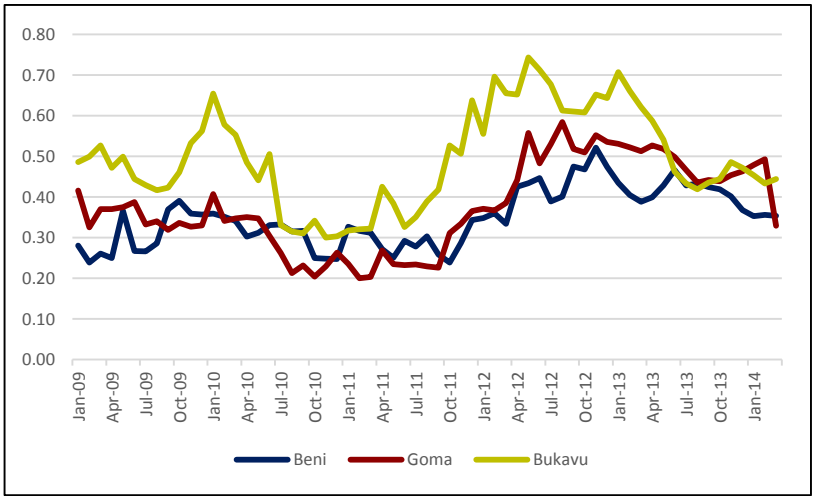
[17] Informal imports monitored from Rwanda transit through many border crossing points between the two countries.

[18] Data from the local Agricultural Inspection Unit in North Kivu Province estimate that cassava production in South Kivu Province only satisfied approximately half of local needs (cited in Njingulala and Bahati 2013). The FEWS NET field assessment and stakeholder workshop found that there are certainly structurally deficit areas within North Kivu Province (Figure 25), but that at the provincial level it is self-sufficient or produces a slight surplus (evidenced by availability of dried cassava from North Kivu Province on markets in South Kivu Province).

25). The timing and extent of these trade flows depends in part on price trends in source and destination markets (Figure 23 - Figure 24).

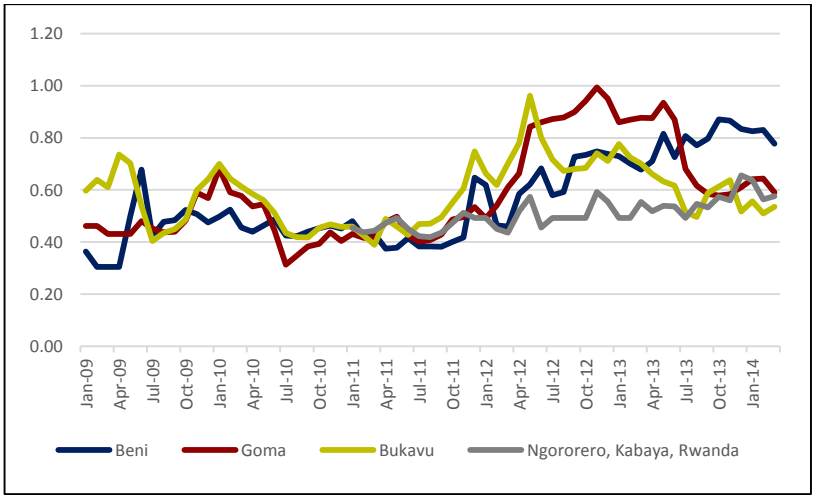
Coupled with long-term conflict, CBSD and CMD have had a negative impact on production in some of the more productive areas of North and South Kivu Provinces. The current effects on aggregate production do not appear to be as severe as those associated with BXW, however.

Figure 23 Dried cassava prices (US$/kg) in North and South Kivu Provinces, 2009-2014



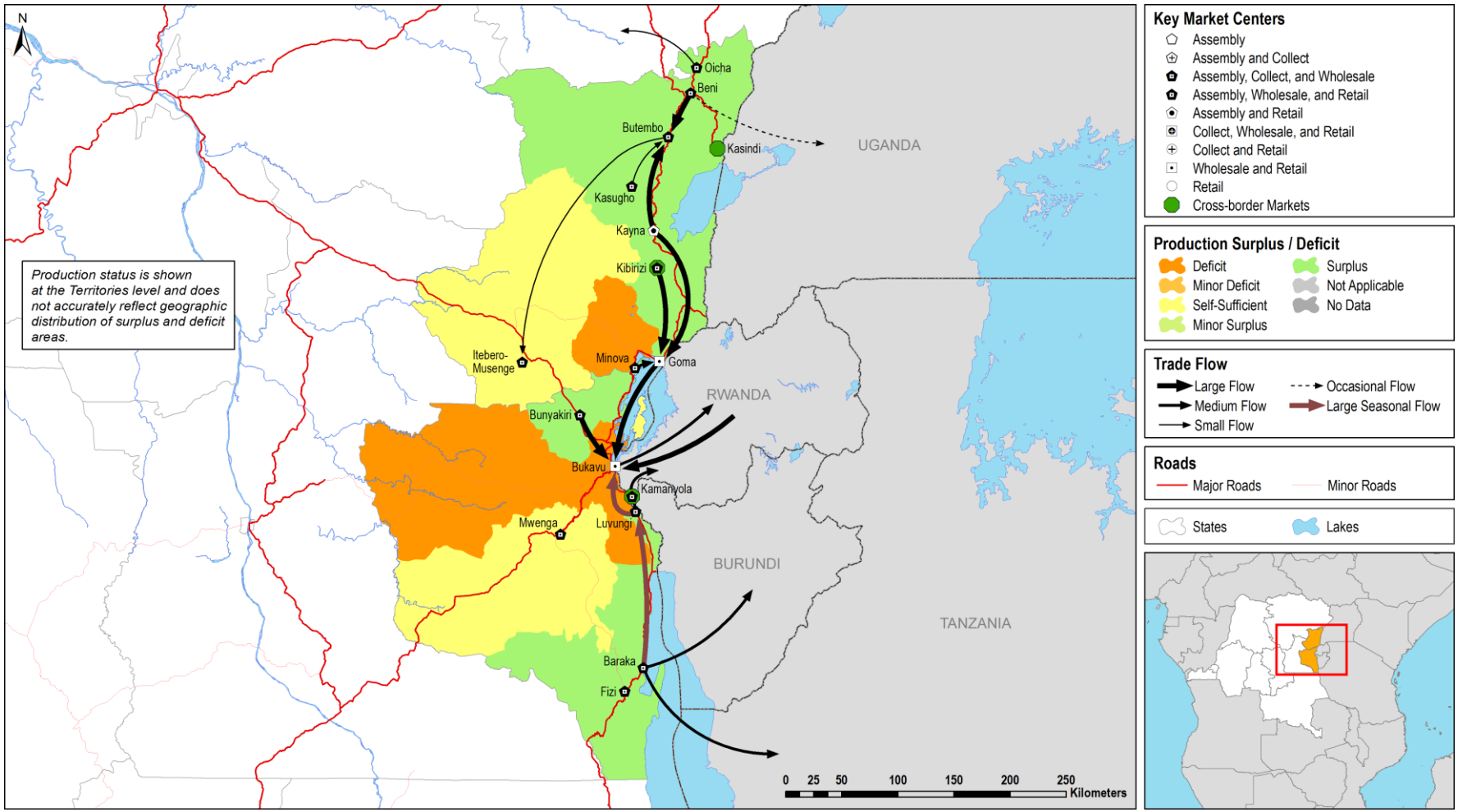
Source: Authors' calculations based on FAO and MADR (2014) and Oanda (2015).

Figure 24 Cassava flour prices (US$/kg) in North and South Kivu Provinces and neighboring countries, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014), Oanda (2015) and Rwanda Ministry of Agriculture (2015).

Figure 25 North and South Kivu Provinces cassava production and trade flow map

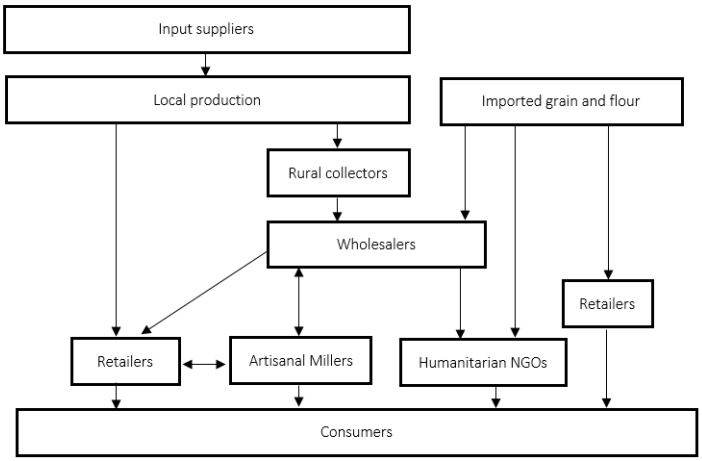


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

3.2 Maize markets in North and South Kivu

Maize is an important staple food in North and South Kivu Provinces. North Kivu Province produces a slight surplus, while South Kivu Province depends on imports from the "*petit nord*" of North Kivu Province, the northern areas of Katanga Province (Moba), and neighboring Rwanda. Maize occupies an increasingly important place in local diets, as households substitute away from bananas toward other starches (including cassava and maize). Maize is consumed fresh and as a type of fufu (thick starchy paste). There are, however, some areas though which maize has yet to enter into production patterns and diets, including the more isolated and westernmost Walikale, Shabunda, Mwenga, and Walungu territories.

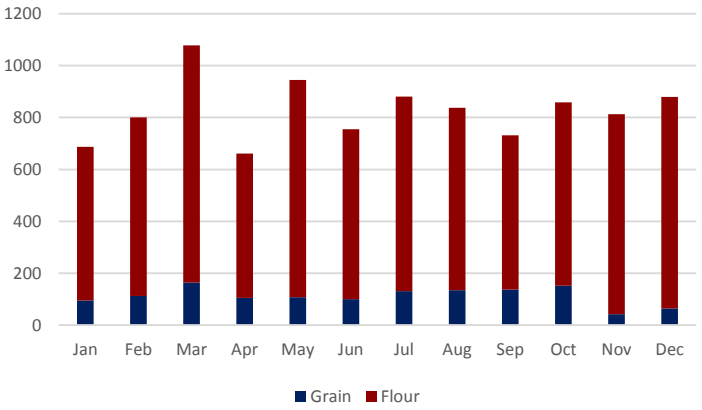
Figure 26 Maize marketing in North and South Kivu Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Unlike the case with cassava and bananas, some large-scale maize producers are vertically integrated with local small- and medium-scale processing facilities. This type of arrangement is also present in the southern part of Katanga Province on a much larger scale. Small-scale producers are estimated to contribute up to 80 percent of local production, while larger-scale producers contribute up to 20 percent. Processing infrastructure in the Kivu Provinces is not as well developed as in neighboring Rwanda, Uganda, and even Katanga Province, largely due to the lack of a consistent/reliable electricity source.

Figure 27 Average monthly informal maize imports (MT) from Rwanda, 2012-2014 [19]

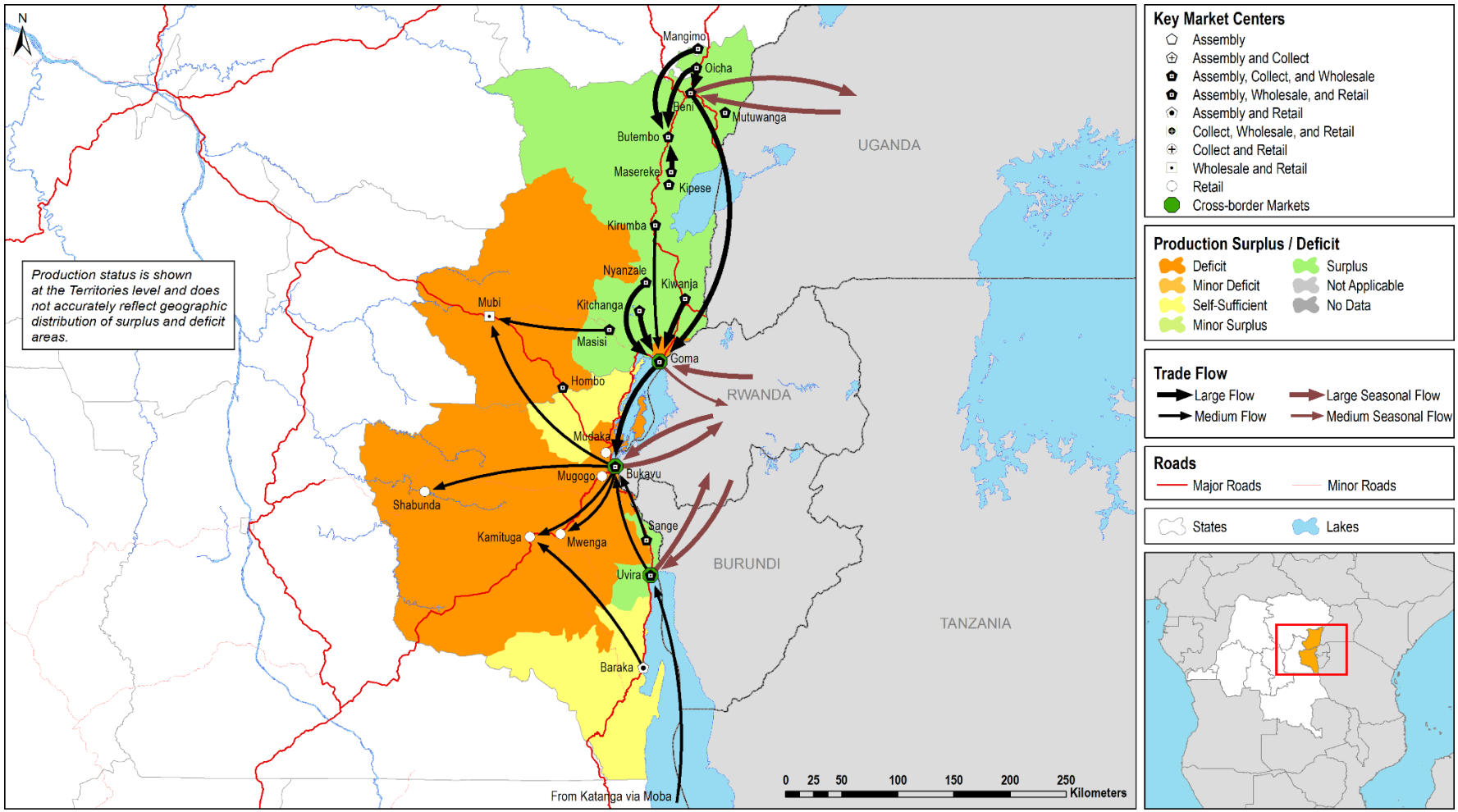


Source: FSTWG MAS database (2015).

The majority of regional trade flows take place on a seasonal basis. To take advantage of the improved storage and processing facilities in neighboring countries, maize grain is exported to neighboring Rwanda and Uganda during the post-harvest period (April-June). Traders in the DRC then import maize flour, largely via informal channels, and on demand. In maize-consuming areas, food assistance beneficiaries receiving in-kind distributions prefer imported maize flour over imported maize grain as it is easier to prepare. Imported maize grain is believed to be firmer than local maize grain, making it more difficult and costly to process.

[19] Informal imports monitored from Rwanda transit through many border crossing points between the two countries.

Figure 28 North and South Kivu Provinces maize production and trade flow map



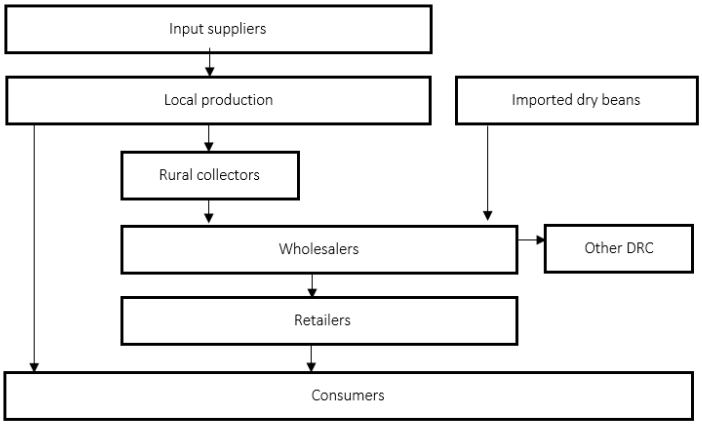
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

3.3 Dry bean markets in North and South Kivu

Over half of the dry beans produced in the DRC are cultivated in North Kivu Province (SNSA 2012). Between 2005 and 2011, annual dry bean production in North Kivu Province nearly doubled, from just over 180,000 MT to over 320,000 MT. This transition was supported by NGOs and IGOs that provided inputs and other technical assistance in the province (Njingulala et al. 2014; Njingulala and Bahati 2013).

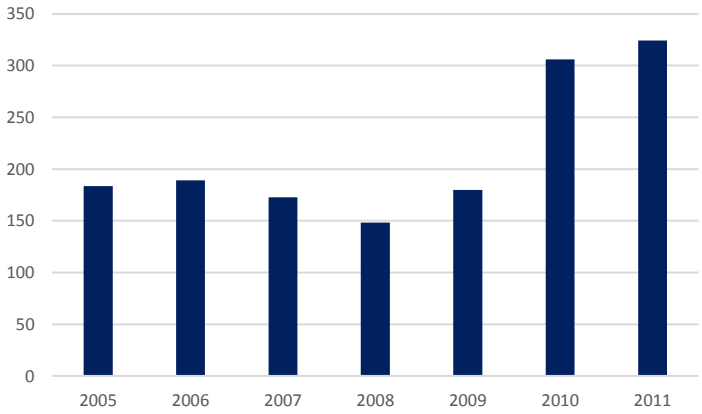
Dry beans are not only an important staple food in North and South Kivu Provinces, but are also an important source of income in surplus-producing areas. Indeed, of the commodities considered for this study in the Kivu Provinces, dry beans in North Kivu Province are the most commercial (O'Donnell, Cook, and Magistro 2015; Njingulala and Bahati 2013). Dry beans produced in the territories of Masisi, Rhutshuru, and Beni are adequate to meet local needs and are sold in the northernmost territories of South Kivu Province and as far away as Kinshasa. Dry bean production is also important in Kabaré District (South Kivu Province), but to a lesser extent.

Figure 29 Dry bean marketing in North and South Kivu Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Figure 30 Dry bean production (000s MT) in North Kivu Province, 2005-2011



Source : Njingulala and Bahati (2013).

A number of different varieties of dry beans are preferred by different end users. For example, the green dry bean (*pigeon vert*) produced in North Kivu Province is preferred by high-income consumers in Kinshasa. A yellow variety (*haricot jaune*) is preferred by consumers in Kisangani. Consumers are believed to generally prefer local beans to imported (regionally or internationally) ones because they are easier to cook.[20]

Although dry beans are much more of a commercial crop than other staple foods, production is done almost entirely by small-scale producers. Rural collectors buy the goods at rural assembly and collection markets or directly from farmers. Wholesalers in the town of Goma (North Kivu Province) play a central role in coordinating dry bean marketing within the Kivu Provinces and beyond. Indeed, storage capacity is limited in the main producing areas. Dry beans are thus transported to Goma during the post-harvest period, assembled by wholesalers and their networks, and then sent on to deficit areas. Wholesalers in the border towns of Goma and Bukavu likewise import dry beans from neighboring Rwanda and Uganda throughout the year. Given the

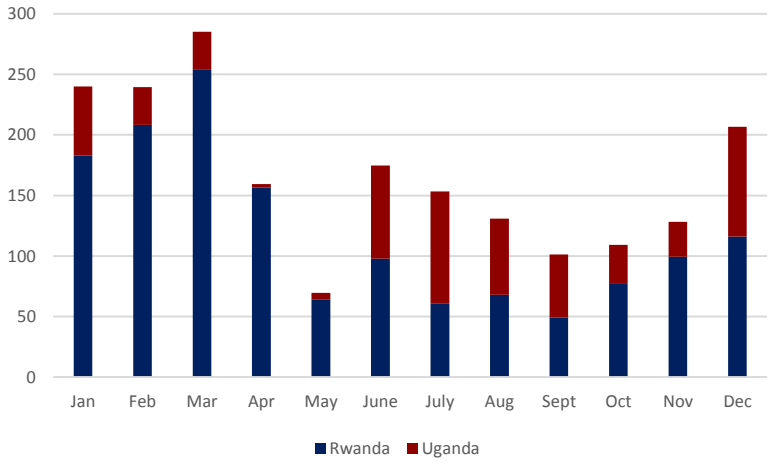
[20] Key informants indicated that internationally sourced dry beans delivered through in-kind assistance programs were less preferred to locally sourced beans because of the large difference in cooking time. Locally produced dry beans may not be as dry as imported commodities due to differences in post-harvest handling methods.

variation in the timing of harvests across all three countries, dry beans are generally available throughout the year.

NGOs and IGOs have played an important role in the expansion of dry bean production and marketing in North Kivu Province in particular. Project-level support from these institutions for access to improved inputs (seeds) and other forms of technical assistance are believed to have contributed significantly to the production trends in Figure 30 (O'Donnell, Cook, and Magistro 2015; Njingulala and Bahati 2013). Some concerns are that by providing free or heavily subsidized inputs, these efforts have simultaneously distorted the private input sector's ability to develop (O'Donnell, Cook, and Magistro 2015).

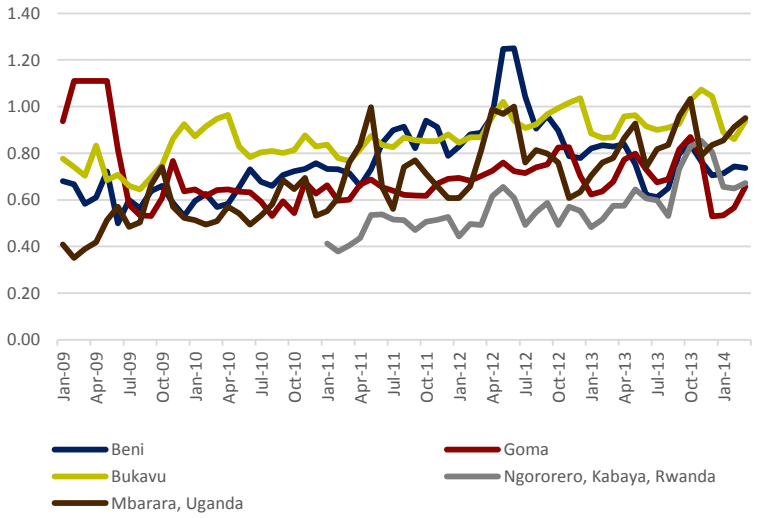
Dry bean prices vary considerably from season to season. However, seasonal price variations are fairly well transmitted from structurally surplus to deficit areas (Figure 32).

Figure 31 Average monthly dry bean imports (MT) from Rwanda and Uganda, 2012-2014



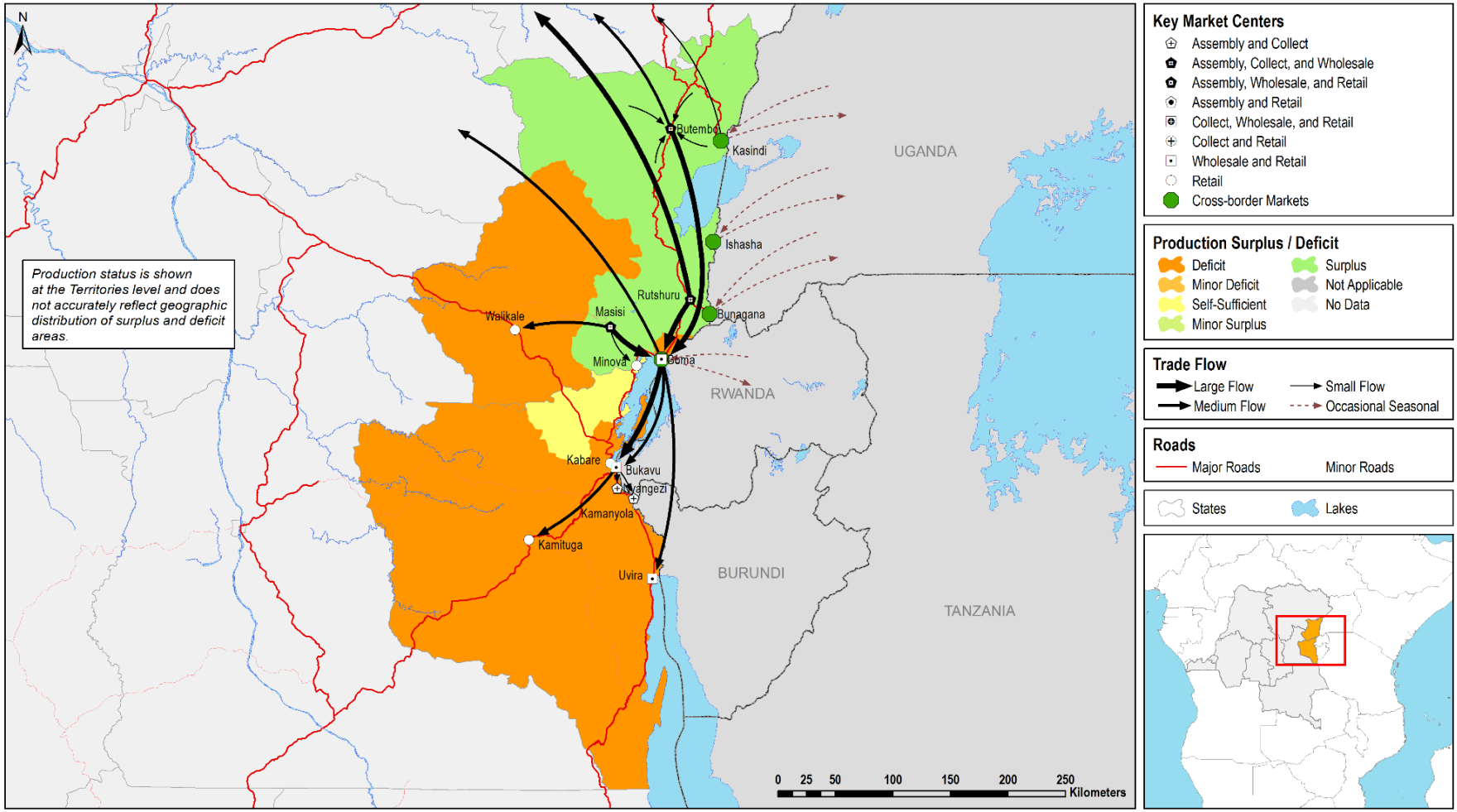
Source: FSTWG MAS database (2015).

Figure 32 Dry bean prices (US$/kg) in North and South Kivu Provinces and neighboring areas, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014), Oanda (2015), Rwanda Ministry of Agriculture (2015), and Farmgain Africa (2015).

Figure 33 North and South Kivu Provinces dry bean production and trade flow map



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

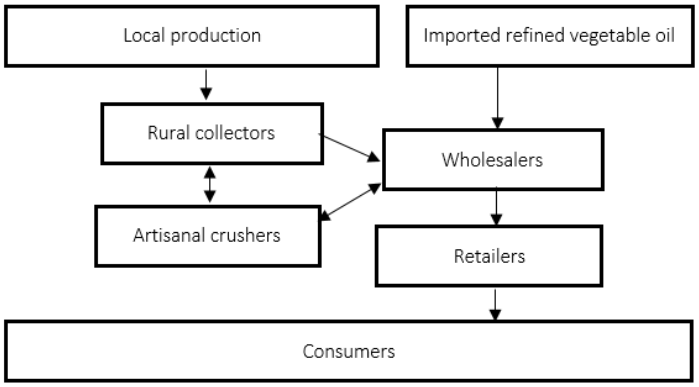
3.4 Edible oil markets in North and South Kivu

Edible oil markets in North and South Kivu Provinces are dominated by locally produced palm oil and imported refined vegetable oil. As with the other commodities studied in this report, North Kivu Province produces a significantly larger quantity than South Kivu Province and depends less (in aggregate and percentage terms) on imports to meet local needs (Table 2).

Locally produced palm oil is produced year-round, using mostly artisanal production techniques. The major surplus-producing areas include Beni toward the north of North Kivu Province and Fizi toward the southernmost tip of South Kivu Province. Other areas that supply the major consumption centers of Goma and Bukavu include Walikale territory (North Kivu Province), Kalehe (South Kivu Province), and Shabunda (South Kivu Province). Important seasonal exports go to neighboring countries via the main cross-border transit points. Those exports reach their peak between April to June and October to December.

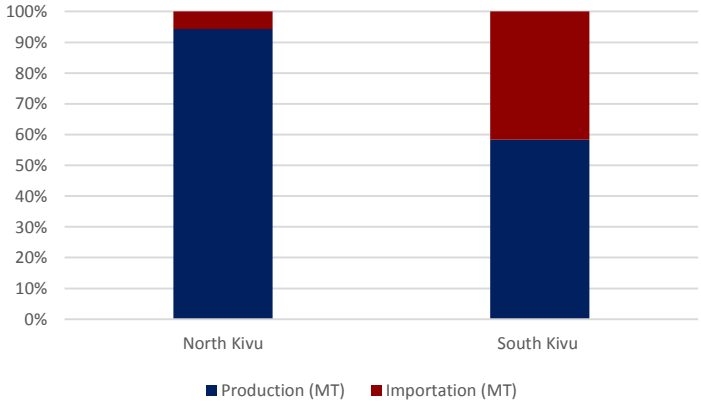
Imports of refined vegetable oil take place year-round. Those imports are largely assured through informal marketing channels and a relatively smaller number of importers (including rice importers, Datcho and Kotecha).

Figure 34 Edible oil marketing in North and South Kivu Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Figure 35 Edible oil supply sources (MT) in North and South Kivu Provinces

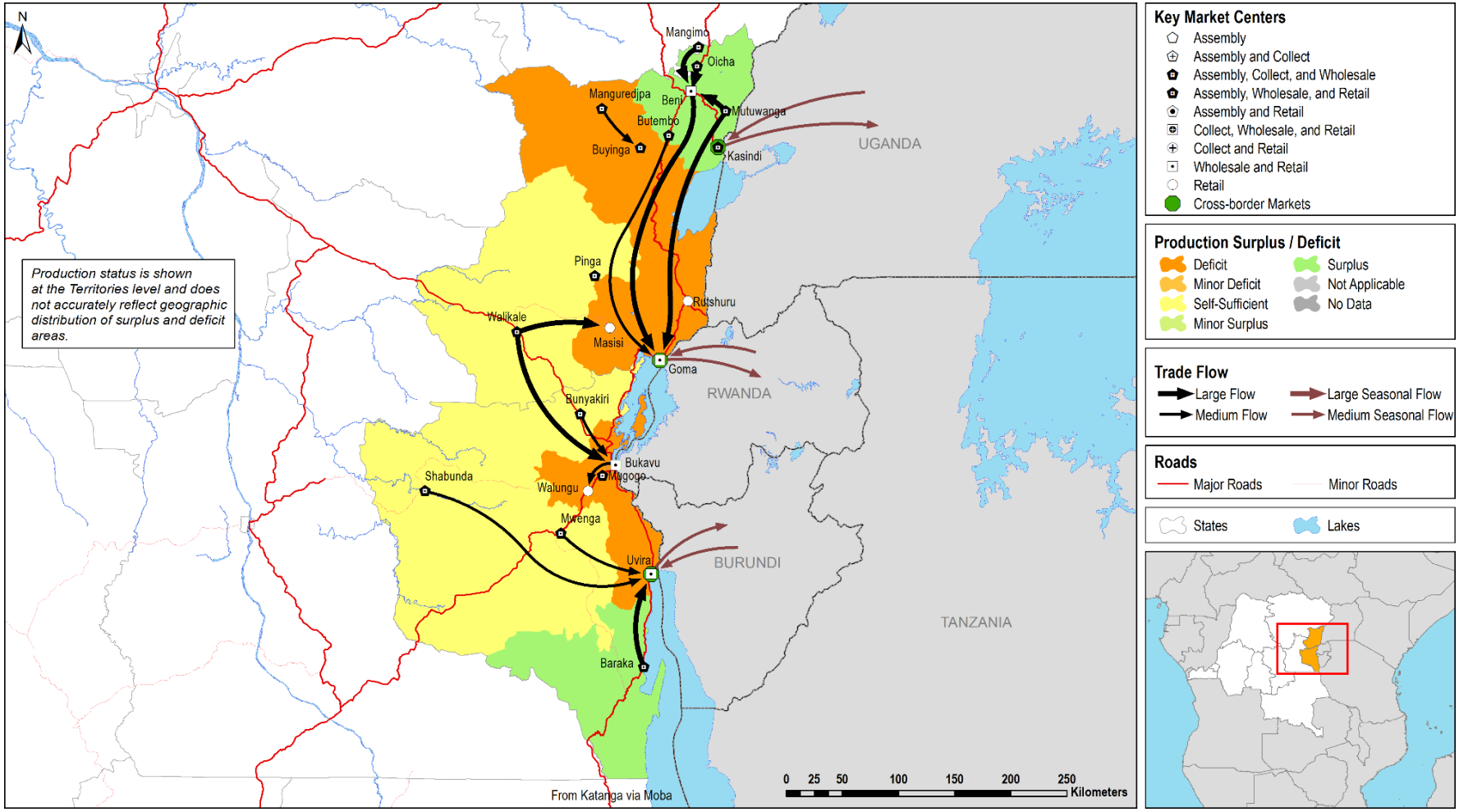


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Unlike in other provinces in eastern DRC, local palm oil is used for both human consumption and artisanal soap making. Artisanal soap is a particularly important source of demand in the "*grand nord*" territories of North Kivu Province (Beni in particular).

Local palm oil and imported refined vegetable oil are available on most rural and urban markets. Locally produced palm oil is preferred in most areas, but substitution is increasingly prevalent depending on local palm oil prices and availability. Of locally produced palm oil, palm oil sourced from Beni territory is preferred in North Kivu Province.

Figure 36 North and South Kivu Province edible oil (palm oil) production and trade flow map

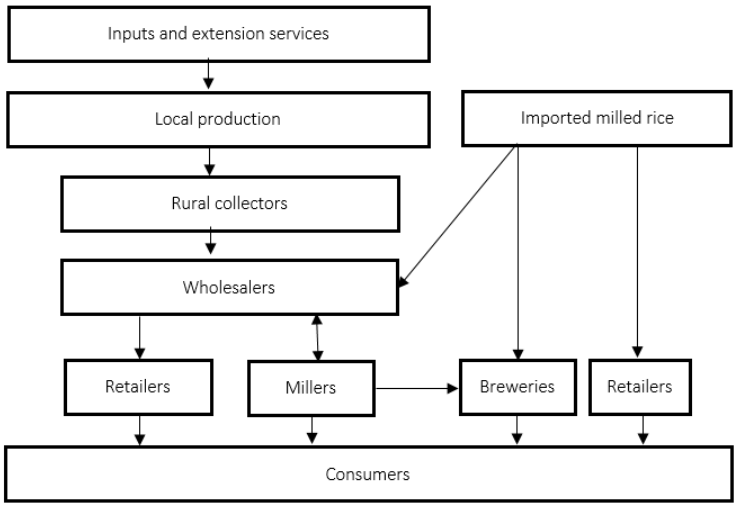


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

3.5 Rice markets in North and South Kivu

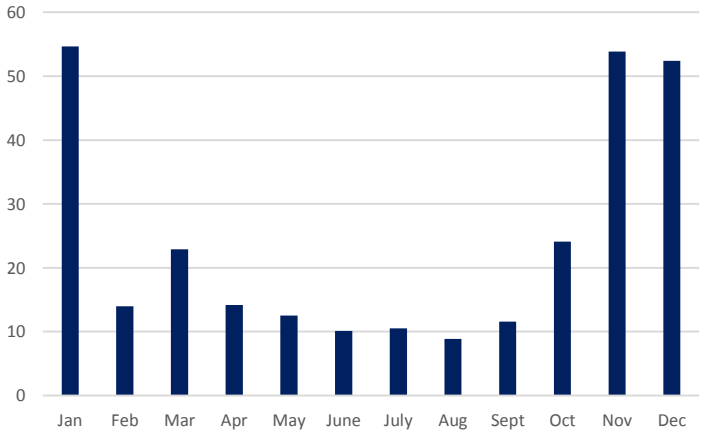
Of the commodity markets considered in this report for North and South Kivu Provinces, the ones for rice are perhaps the most dynamic. Although rice ranks behind cassava in terms of importance in the Kivu Provinces, production patterns, import volumes, and domestic marketing channels are evolving rapidly. In aggregate terms, North and South Kivu Provinces are estimated to produce enough to cover less than a quarter of local demand (SNSA 2012; Njingulala and Bahati 2013). Imports of locally produced rice from neighboring countries and international imports therefore play a very important role in meeting aggregate demand.[21] Rice in the Kivu Provinces is consumed directly as a staple food, but it is also used as a grain in the fermentation process by local breweries.

Figure 37 Rice marketing in North and South Kivu Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Figure 38 Average monthly rice imports (MT) from Rwanda, 2012-2014



Source: FSTWG MAS database, 2015.

The three main rice production systems in the Kivu Provinces are rainfed, high-altitude irrigated, and low-altitude irrigated. Rainfed rice production was once most important in areas like Shabunda, Mwenga, and Walikale (SNSA 2012). In those areas, production has declined substantially in recent years as the local artisanal mining sector has become more and more important and due to the effects of conflict and displacement (Bucekuderhwa 2005; Njingulala and Bahati 2013).[22] At the same time, irrigated rice production in the "*grand nord*" (near Beni, North Kivu Province) and in the *Plaine de la Ruzizu* (in Uvira territory of South Kivu Province) is growing. Some households affected by BXW and other plant diseases have also substituted toward rice production (Njingulala and Bahati 2013).

Local brewers in particular rely increasingly on local rice production as inputs to production to complement the use of imported rice from regional and international markets. Over half of local production in surplus-producing areas is believed to be destined for the local brewing sector. In the territories of Uvira, Beni, and Lubero, breweries work with local buyers to coordinate purchases from farmers (usually milled, broken rice). The

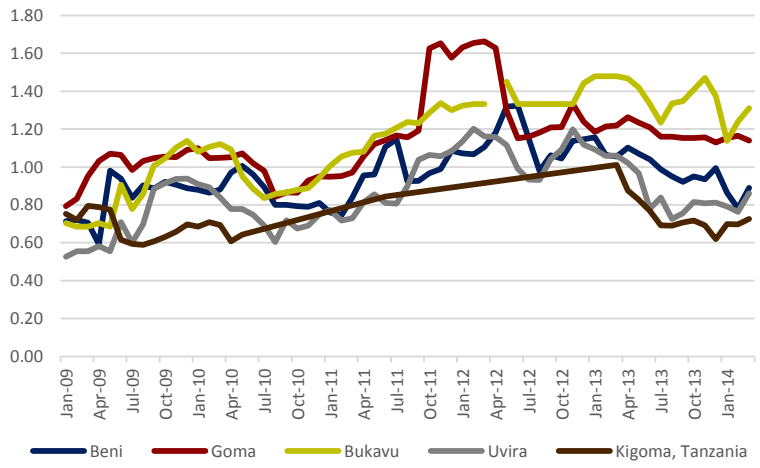
[21] Internationally imported rice, largely Pakistani, transits either via the port of Dar es Salaam to Kigoma and then across Lake Tanganyika to the DRC or via the port of Mombasa to Uganda and then into Goma.

[22] Although the study is dated, Bucekuderhwa (2005) found that none of the existing local rice mills in Shabunda and Mwenga were operational. Recent anecdotal evidence suggests that the situation has not improved since that time.

breweries have relatively stringent quality and quantity requirements and are required to work through intermediaries (including producer organizations) and therefore have more or less fixed purchase prices. In Uvira, the majority of local rice is grown as a cash crop, while the local population prefers to consume Tanzanian imports (locally produced Tanzanian rice).[23]

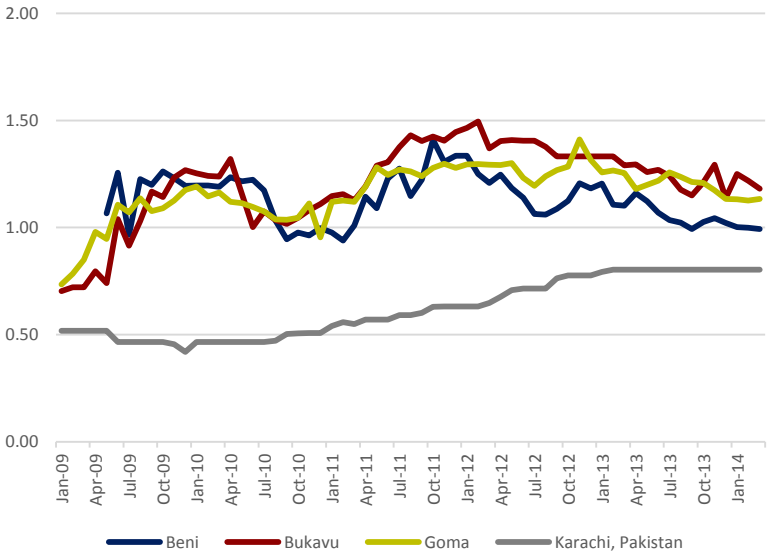
Local rice purchases by the local brewing may be contributing to relatively thinner local rice markets in some of the most productive areas, while at the same time providing a more viable/competitive market outlet for locally produced rice, as local production is not of comparable quality to regionally or internationally produced rice.[24] Price trends (Figure 39 - Figure 40) further support the idea that retail prices for local rice are not particularly competitive on domestic markets. Imported and locally produced rice prices are within a very similar range.

Figure 39 Local rice prices (US$/kg) in North and South Kivu Provinces and neighboring countries, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014), Oanda (2015), and Tanzania Ministry of Industry, Trade and Marketing (2014).

Figure 40 Imported rice prices (US$/kg) in North and South Kivu Provinces and international markets, 2009-2014

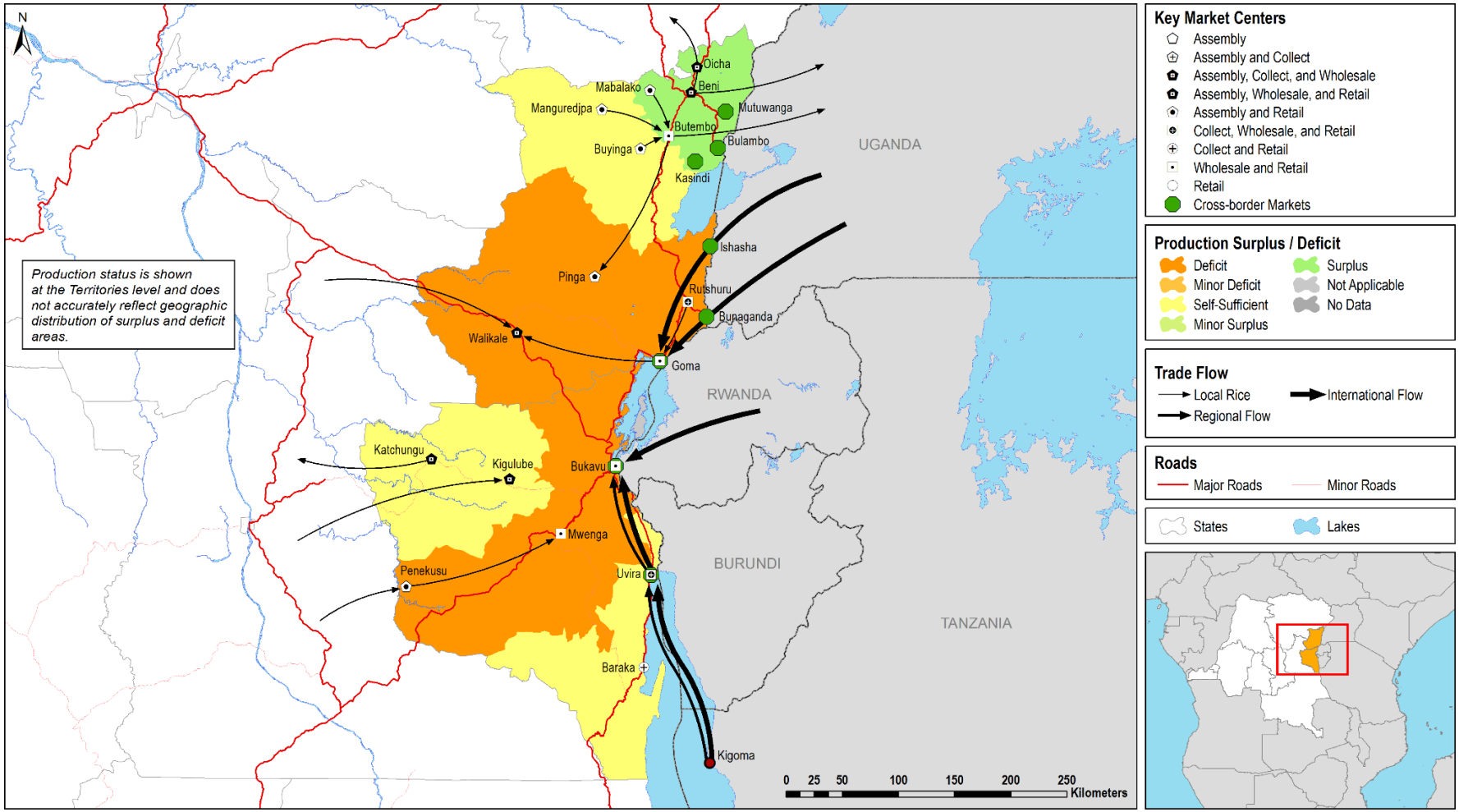


Source: Authors' calculations based on FAO AND MADR (2014), Oanda (2015), and Pakistan Bureau of Statistics (2015).

[23] Uvira has a strong history of cash crop production as the territory used to be an important cotton producing area (de Failly 2000).

[24] The assessment team did not meet directly with brewers or rice millers in either province. Other key informants provided the assessment team with this information, which was corroborated during different meetings.

Figure 41 North and South Kivu Provinces rice production and trade flow map

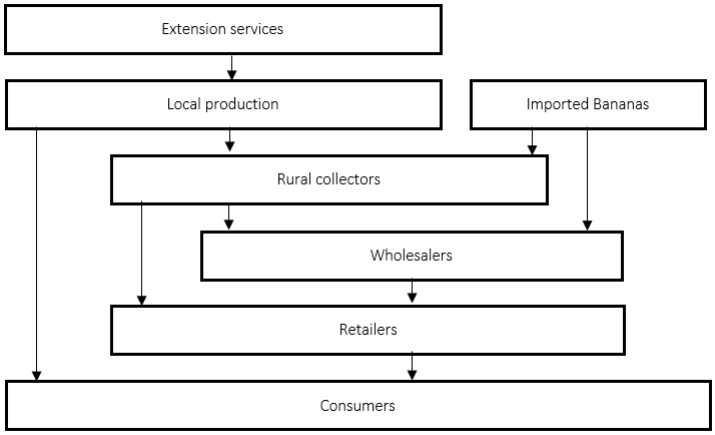


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

3.6 Banana markets in North and South Kivu

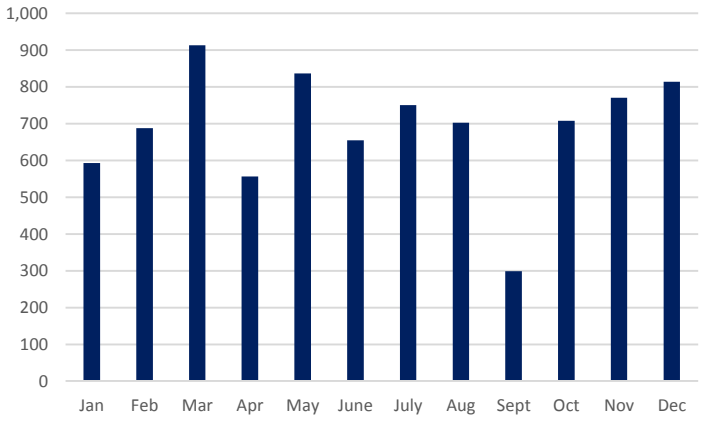
In terms of aggregate production, bananas are considered the second most important staple food produced in North Kivu Province. At the provincial level, North Kivu Province is generally self-sufficient while South Kivu Province imports small quantities from both the "*petit nord*" of North Kivu Province and neighboring Rwanda (Figure 43). The main surplus-producing territories include Masisi and Beni in North Kivu Province. Trade flows between areas take place over fairly short distances due the relative perishability and delicate nature of the crop (Figure 44).

Figure 42 Banana marketing in North and South Kivu Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Figure 43 Average monthly informal banana imports (MT) from Rwanda, 2012-2014[25]



Source: FSTWG MAS database (2015).

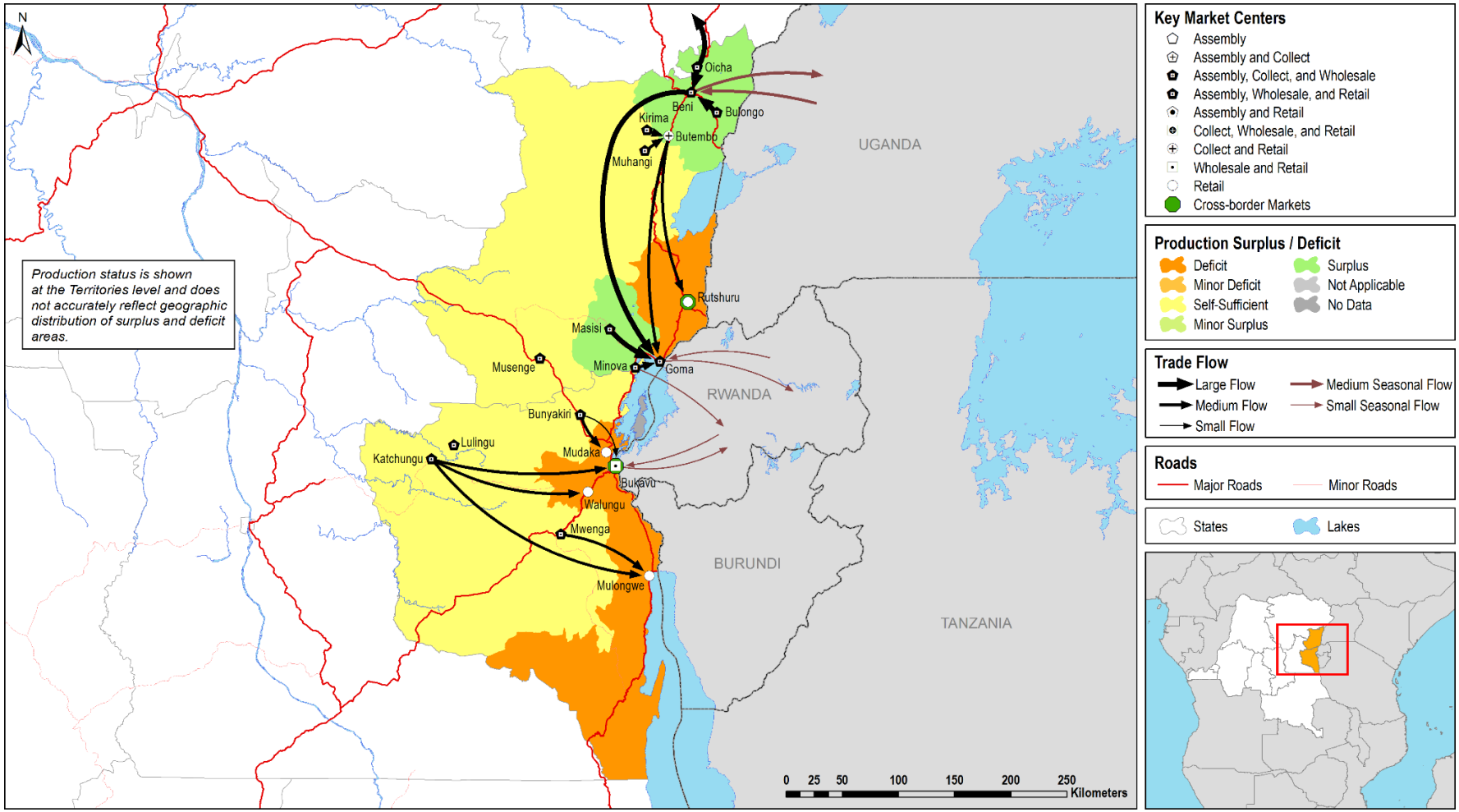
Much like for dried cassava, the marketing channels for bananas are fairly short (Figure 42). Bananas are mostly grown by small-scale producers. Once harvested, the different banana varieties have different end uses, many of which are traditionally important income sources for producing households; they occupy an important cultural place as well (O'Donnell, Cook, and Magistro 2015; Vigheri 2008). Banana plantains are sold fresh on the stalk and processed into fufu or fried. Dessert and sweet bananas are consumed fresh. Beer bananas are fermented to produce a local brew, mostly by rural women, using artisanal techniques. In Masisi, one of the local banana varieties is peeled and dried in a manner similar to that used for cassava and then processed into a flour. Due to their highly perishable nature, bananas are not stored. As they are grown year-round, storage is less of a concern than for more seasonal crops.

The presence of BXW has had a devastating effect on production in the main producing areas of the country (including the Kivu Provinces).[26] The most noticeable impact on markets is that producing households have been induced to shift toward other crops (such as cassava, maize, potatoes, and rice).

[25] Informal imports monitored from Rwanda transit through many border crossing points between the two countries.

[26] This issue and the impacts on food security in the eastern provinces of the DRC are being addressed in a separate forthcoming body of work by FEWS NET.

Figure 44 North and South Kivu Provinces banana production and trade flow map

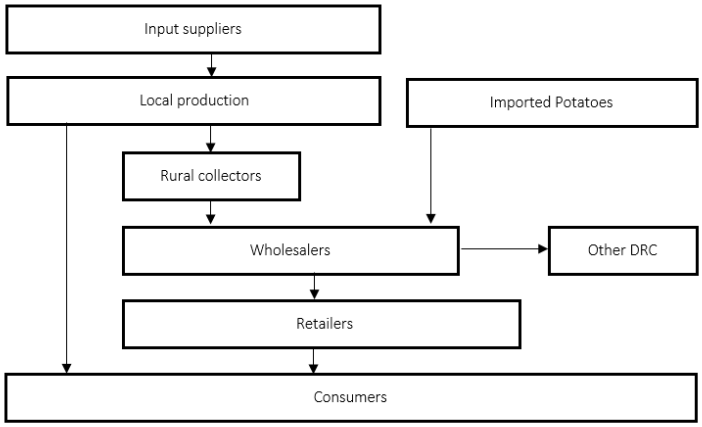


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

3.7 Potato markets in North and South Kivu

North and South Kivu Provinces jointly contribute to over three-quarters of domestic potato production in the DRC (SNSA 2012; O'Donnell, Cook, and Magistro 2015). Potato production and consumption are practiced most widely in higher altitude areas of North Kivu Province (Beni, Lubero, and Masisi territories) as well as the northernmost territories of South Kivu Province. Consumption is believed to be most intense in urban areas and in mining areas of North Kivu Province (Masisi and parts of Walikale in particular). In large parts of South Kivu Province, potatoes are not consumed at all (Figure 47).

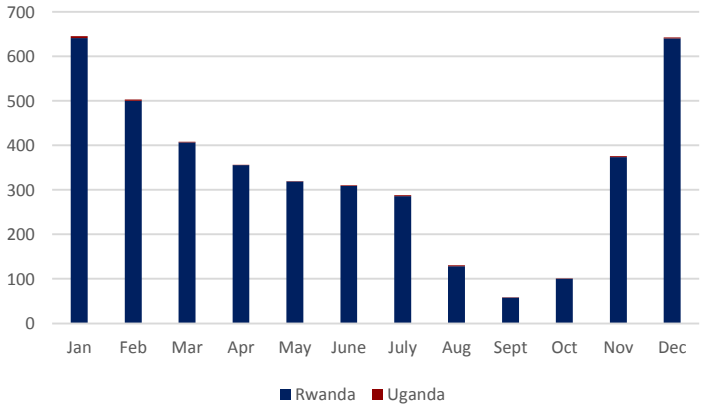
Figure 45 Potato marketing in North and South Kivu Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

Potato production (Irish potatoes as well as sweet potatoes) has increased in recent years. Producers in highland areas in particular have shifted out of banana and cassava production in areas with a particularly high prevalence of plant diseases. The varieties of potatoes now grown in those areas are largely immune to existing local plant diseases.

Figure 46 Average monthly potato imports (MT) from Rwanda and Uganda, 2012-2014



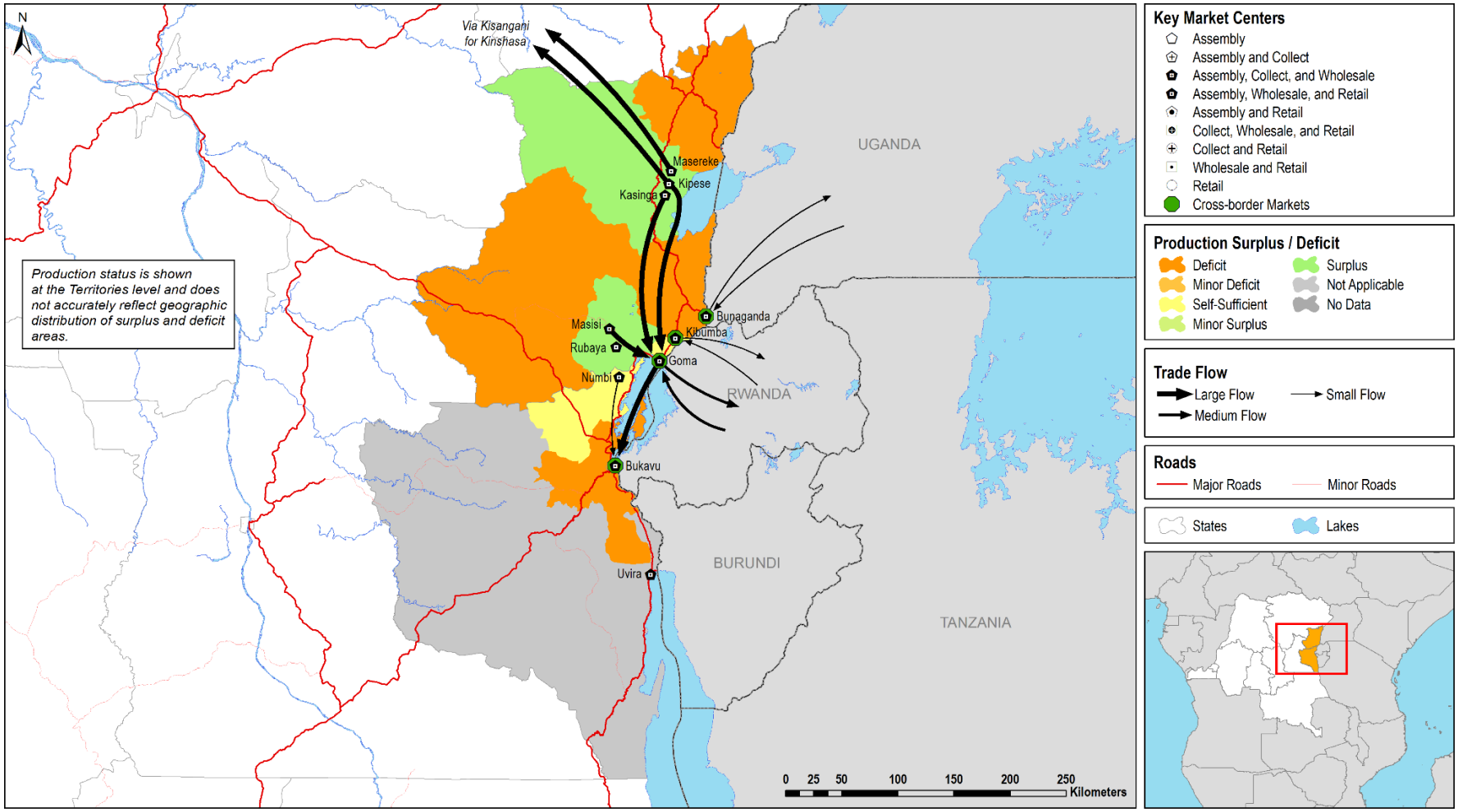
Source: FSTWG MAS database (2015).

North Kivu Province is, on aggregate, self-sufficient or produces a slight surplus that is marketed to South Kivu Province and neighboring countries. At times, potatoes are marketed directly to high-income consumers in Kinshasa (O'Donnell, Cook, and Magistro 2015; Njingulala and Bahati 2013). However, those market linkages are limited and depend heavily on the availability and cost of freight options. Potatoes are more perishable than dry beans, for example, and cannot easily withstand the extended transit period via truck and boat between North Kivu Province and Kinshasa (passing through Kisangani); although such trade flows do take place in limited quantities.[27] This generally keeps the marketing channels and distances traveled between production and consumption centers fairly short (Figure 45).

Imports of Irish potatoes from Rwanda vary considerably over the course of the calendar (Figure 46). They peak during December and January during end-of-year festivities, when local demand is greatest. Imports from Uganda also take place, but at much lower aggregate and monthly quantities.

[27] FEWS NET's understanding is that when air freight between Goma and Kinshasa was more affordable, many high-value and perishable commodities (potatoes, as well as milk, cheese, and meat) were regularly transported between these urban centers via airplane. Key informants indicate that Irish potatoes are now imported from South Africa into Kinshasa in larger quantities than via plane, road, or boat from North Kivu.

Figure 47 North and South Kivu Provinces potato production and trade flow map

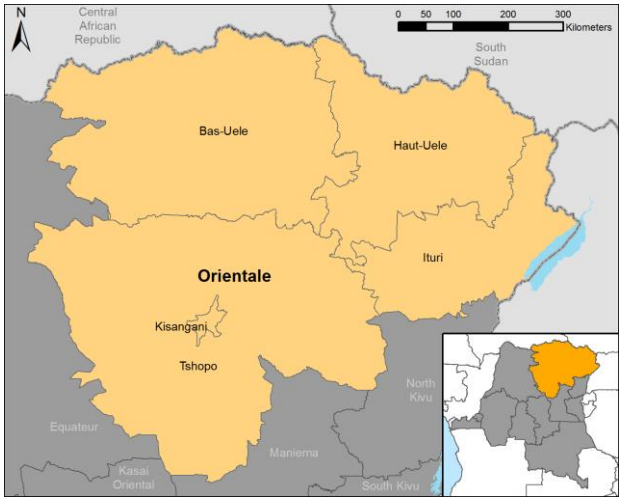


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Goma, North Kivu (May 2015).

4. Orientale Province

- This report focuses primarily on staple food markets in the Irumu and Mambas territories within Ituri District, located in the eastern part of Orientale Province. Before the war, Ituri District was the "bread basket" of Orientale Province. Today, the province is largely self-sufficient in many products, with the exception of rice and vegetable oil. Localized deficits exist, though, and vary considerably by commodity.

Figure 48 Map of Orientale Province



Source: Author's estimates based on FAO GAUL (2015).

- Although Mambasa is the largest territory in Ituri District, with an area of about 36,783 square km, it has the smallest population density, with about 14 people per square km. Mambasa territory is mostly covered by forest; hunting and mining is the main economic activity, with limited agricultural activities. In contrast, Irumu territory is the second largest, with an area of 8,183 square km and a population density of 245 people per square km. The long-term effects of conflict and displacement are the primary causes of declining food production and marketing in Orientale Province.

Cassava (manioc) is by far the most important staple food produced and consumed in Ituri District and in Orientale Orientale Province more generally (Table 7;

- Table 8). Other important staple foods include maize, dry beans, bananas, local rice, sweet potatoes, groundnuts, and imported rice. Edible oil (either locally produced palm oil or imported refined vegetable oil) is also consumed by most households and with all meals, although its quantities might be small per meal.

Table 6 Sources of commodity supply in Orientale Province (MT) [(a)]

	Cassava [(b)]	Maize [(c)]	Dry beans [(d)]	Edible Oil [(e)(f)(g)]	Milled rice [(h)(i)]	Bananas
Local production	1,974,332	97,917	16,282	3,000	70,874	221,763
Imports [(j)]	2,203	20,208	5,611	100	23,586	303
Other DRC supply	0	0	500	0	0	0
Total supply	1,976,535	118,125	21,893	12,100	94,459	222,066

Note:
(a) Local production based on average 2005-2011 data unless otherwise specified.
(b) Cassava imports include both fresh cassava and cassava flour. Cassava flour is converted into the fresh equivalent using a conversion factor of 1 MT fresh = .33 MT dried.
(c) Imports of maize include both maize grain and maize flour.
(d) Dry beans are sourced from North Kivu and transit via the southeastern part of Orientale on the way to Kisangani. Some of that production is consumed on site and a portion also continues on to Kinshasa.
(e) Assumes provincial production of approximately 30,000 MT of palm kernels and a crushing rate of 10% (AGRER 2006).
(f) Of palm oil produced in Orientale Province, one-third is estimated to be processed industrially and two-third artisanally (AGRER 2006).
(g) Imports of palm oil are mostly informal flows from Uganda.
(h) Milled rice assumes a milling rate of 65%.
(i) Imports of milled rice are mostly formal flows rice from international markets that transit through Uganda.
(j) Imports are from international or regional markets, from or via Uganda.

Source: Authors' calculation based on SNSA (2012), FAO STAT (2015), AGRER (2006); FEWS NET workshop proceedings Bunia (May 2015); OCC (2015).

Table 7 Average agricultural production (kg) per capita in Orientale Province, 2006-2011 [(a)]

Province/District	Maize	Rice [(b)]	Cassava	Banana	Dry Beans	Edible Oil [(c)]
Orientale	9.50	10.54	191.35	19.34	1.56	0.0012
Bas-Uele	8.43	13.00	127.09	28.67	0.03	N/A
Haut-Uele	16.35	24.04	246.44	17.93	0.31	N/A
Ituri	11.90	3.82	189.37	12.62	4.22	N/A
Tshopo	0.40	0.58	15.09	3.29	N/A	N/A

Note: (a) Province-level per capita averages were calculated based on the entire provincial population; district-level per capita averages were calculated after excluding urban populations in the district as many urban centers comprise distinct districts with near-zero production.
(b) Paddy rice.
(c) Production data only available at the province level.

Source: Authors' calculations based on SNSA (2012), Akakpo, Randriamamonjy, and Ulimwengu (2014), and FEWS NET (2015a).

Table 8 Ranking of commodities consumed, in order of importance, by district in Orientale Province

Product/District	Mambasa (Ituri)	Irumu (Ituri)	Djibu (Ituri)	Majaji (Ituri)	Aru (Ituri)	Haut Uele	Bas Uele	Tshopo
Cassava	1	1	1	1	1	2	2	1
Maize grain/flour	3	3	3	3	3	5	5	4
Beans	5	2	2	2	6	4	6	
Bananas	4	6	4	5	5	1	1	3
Rice-local	2	7	7	7	4	3	3	2
Sweet potatoes	7	5	6	4	7	N/A	N/A	N/A
Peanuts	6	8	8	6	2		4	5
Rice-imported	8	4	5	8	8	*	*	*

Rank 1= Most important, 8 = least important, N/A = not consumed or limited consumption

Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

- Orientale Province has a bimodal rainfall regime, with two distinct growing seasons, season A and season B. Mid-February to mid-May and mid-July to mid-October are wet months. Mid-October to mid-February and mid-May to mid-July are dry months.
- Four main marketing basins exist in Orientale Province. The largest marketing basin is centered around the large commercial town of Kisangani in Tshopo District. Kisangani is directly linked to Kinshasa via the Congo River, while trade with the rest of the province (including the easternmost districts) is quite limited. The second main marketing basin is centered around Bunia, in Ituri District, and includes trade with neighboring Uganda and the *"grand nord"* of North Kivu Province. The third most important marketing basin is located in Isiro (Haut-Lele). A fourth marketing basin, centered around Buta in Bas-Lele District, is the least dynamic of the four in terms of the variety and quantity of goods traded. Varying production and consumption patterns and generally poor infrastructure limit the extent to which trade takes place between these areas.
- Several factors influence agricultural productivity in Orientale Province. Closely related factors impede increased production and marketing and are consistent with other provinces considered in this report, including (but not limited to): inadequate access to high-quality inputs (including seeds); unpredictable rainfall patterns; inadequate government support to the agriculture sector (for example, low budgets and lack of agricultural subsidies), including a lack of extension services and technical supervision or the implementation of existing agricultural development policies; limited access to land (prevalent in Isiro and eastern Ituri); and pests and diseases (for example, BXW). Indeed, at times policies are implemented in Kinshasa but are not observed in far-reaching areas, such as eastern Orientale Province. Other factors that affect production and contribute to structural food deficits include theft (even in gardens), mining (which reduces the supply of agricultural labor in some areas), limited use of improved inputs, low farm gate prices,

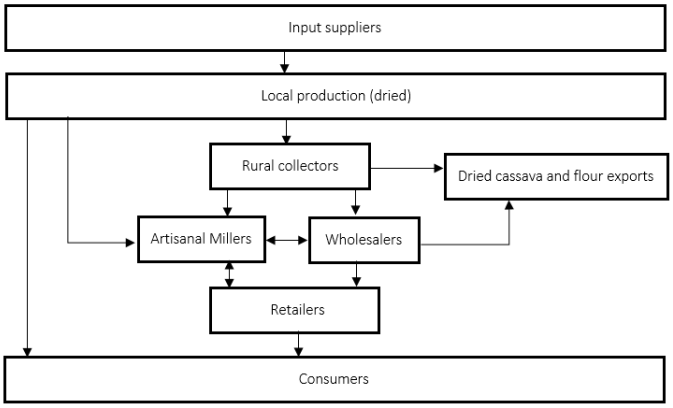
and lack of value addition and processing. Producers and traders therefore must take into consideration many other factors apart from prices in making their production and marketing decisions.

- Poor infrastructure further affects economic activities in the province. Trade between Orientale Province (Kisangani) and Kinshasa has historically been driven by boat transport along the Congo River. Orientale Province has no tarmac roads and most secondary roads in Ituri District are murum (gravel). The feeder roads in most areas are in very poor condition. Many bridges are made of wood, are poorly maintained, and break down often. The poor state of roads and bridges makes the movement of staple crops impossible or very expensive, which results in a high cost of food for both rural and urban consumers and low crop incomes for producing households.
- Unlike the southwestern part of the province, river transport is not used in Ituri District. The Kisenyi port on Lake Albert is not used to transport staple foods from Uganda to the DRC. The port has a privately owned ferry that transports people and some higher-value and perishable products like fish or tomatoes (from Uganda). Most goods transported into and within the eastern part of Orientale Province (including Ituri District) are carried by trucks of varying capacities depending on destination, customers, and commodities. The causes of the variation are road conditions (which vary by dry and wet season) and vendor size. As in the Kivu Provinces, FUSO trucks of up to 10 MT are the most commonly used vehicle by local traders. Pickup trucks capable of carrying 2-3 MT are also common. Relatively larger trucks of about 20 MT are used to import goods from Uganda to Bunia.
- Offering bribes on the roads is a standard operating procedure in Ituri District and enables speed of movement. Bribes are generally small (about 500 CDF, or US$0.50, per stop), but typically occur at many points along a given road. For example, ten checkpoints exist along the 75-km road linking Bunia to Komanda. As long as the bribes are paid, traders incur little to no harassment at these checkpoints. However, traders and administrators reported significant insecurity and theft on roads.
- The availability of storage facilities is generally a challenge for both the private sector and NGOs across Orientale Province, including Bunia town and Ituri District. For the private sector, one large permanent warehouse can store up to 100 MT. NGOs and WFP, on the other hand, have reverted to using rub-halls, temporary shared storage facilities, or keeping imported commodities in Uganda until as close to the time of distribution as possible (Annex 6).
- Women participate at various levels of marketing chains. In particular, cassava trade is dominated by small-scale women traders in Bunia. Retail-level sales of most commodities are by women as well. Men are much more active in livestock trade (and butcheries) and mining activities.

4.1 Cassava markets in Orientale

Cassava is the most important crop produced and consumed in Orientale Province. In addition to being a foodstuff (consumed fresh, as fufu, or roasted), cassava is used to produce a local alcohol in Orientale Province. Cassava is available and consumed throughout the year by both rich and poor households in rural and urban areas. However, wealthier households have a more diverse diet and consume other starches (like rice, maize, and bananas, among others).

Figure 49 Cassava marketing in Orientale Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

Cassava is widely produced in all parts of Orientale Province. Between 2006 and 2011, Orientale Province produced over 2 million MT (MMT) of fresh cassava, representing just under 20 percent of total cassava production in the DRC (SNSA 2012). Over that period, Ituri District was the most productive within Orientale Province (Annex 5).

Mahagi, Aru, Banalia, and Bondo are areas with major surpluses while Irumu, Poko, Bambesa, Dungu, and Opala have minor surpluses. Mambasa, Djugu, Buta, and Bafwasande are self-sufficient while Bunia, Kisangani, and Isiro are all deficit areas (Figure 52).

Three separate marketing basins exist for cassava in Orientale Province, most likely because of the widespread production of cassava across the province and the poor road infrastructure between districts.

- The largest marketing basin is around the Kisangani area, in Tshopo District. Cassava typically flows from Bambesa and Buta in Bas-Uele District, Banalia, Basoko, Yahuma, Isagi, Opala, Ubundu, and Bafwasende to Kisangani.
- The second basin is around the Bunia area in Ituri District. Cassava flows from Mahagi, Djungu, and Irumu to Bunia town (Ituri District). Cassava also flows from Mahagi and Aru to Durba and Watsa and into West Nile in Uganda.
- The third basin is around the Isiro area in Haut-Uele District. Cassava flows from Niangara, Rungu, Poko, and Wamba to Isiro. Some cassava flows from Bondo in Bas-Uele into CAR.

The main actors in the cassava marketing channel include farmers, processors, wholesale traders, retail traders, and consumers (Figure 49). Farmers typically sell dry cassava chips to processors who mill the cassava into flour. Farmers may also sell dry cassava chips to traders and directly to consumers. The processors sell cassava flour to traders who also sell flour to consumers.

Although cassava and cassava flour are available year-round, some variation arises in the weekly quantities traded, particularly in deficit areas. In Bunia, for example, the quantities traded per week vary from 20 MT during the low season (December to May) to 30 MT during the high season (June to November) (Table 9). Likewise, some seasonal variation occurs in dried cassava and cassava flour prices (Figure 50 - Figure 51).

Table 9 Quantities of dried cassava traded in Bunia Central Market, Orientale Province

Cassava [(a)]	Trucks/week	MT/truck	Weeks	Quantity (MT)
Trucks in high season (June-November)	3	10	26	780
Trucks in low season (December-May)	2	10	26	520
Total				1,300

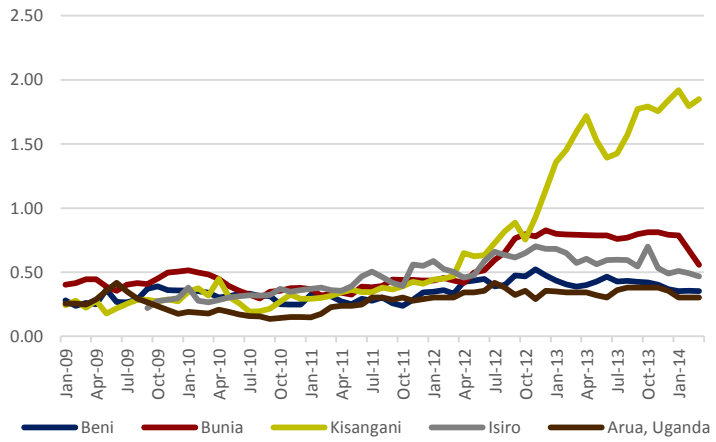
Note: (a) The quantities listed here refer only to the quantities traded in Bunia Central Market (one of many markets in Bunia town).

Source: Authors' calculations based on field assessment.

Cassava trade is dominated by small-scale women traders in Orientale Province, and in Ituri District more specifically. For example, about ten traders, predominantly women, combine to fill a FUSO truck with cassava and other crops. The quantities of commodities such as cassava that traders buy and sell depend on the season and route. Three big cassava stores operate in Bunia Central Market, each with about seven to ten traders. In terms of entry and exit requirements, trade licenses (*License de commerce*) are required to start a large-scale business. Small-scale traders pay taxes (*péage de taxe*) in the market.

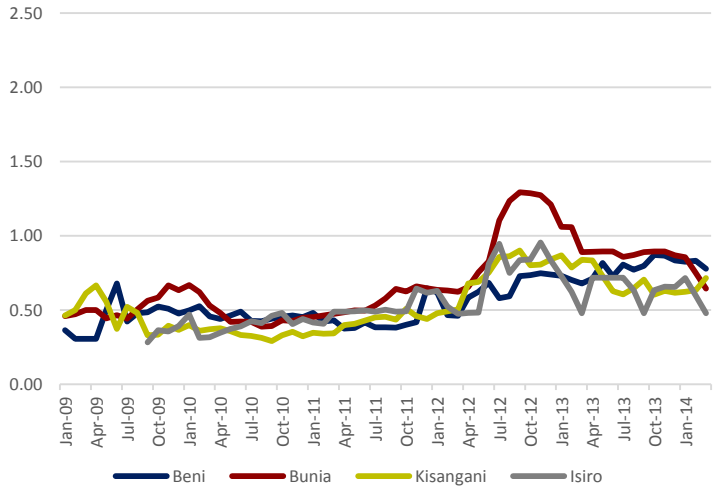
No single trader seemed to have the capacity to influence prices or quantities sold. Although markets are liberalized, the government can regulate large-scale-traders believed to be charging excessive prices or earning excessive profits. The assessment team found that in Ituri District, and elsewhere in Orientale Province, adequate quantities of cassava were available to meet local needs.

Figure 50 Dried cassava prices (US$/kg) in Orientale Province and neighboring countries, 2009-2014



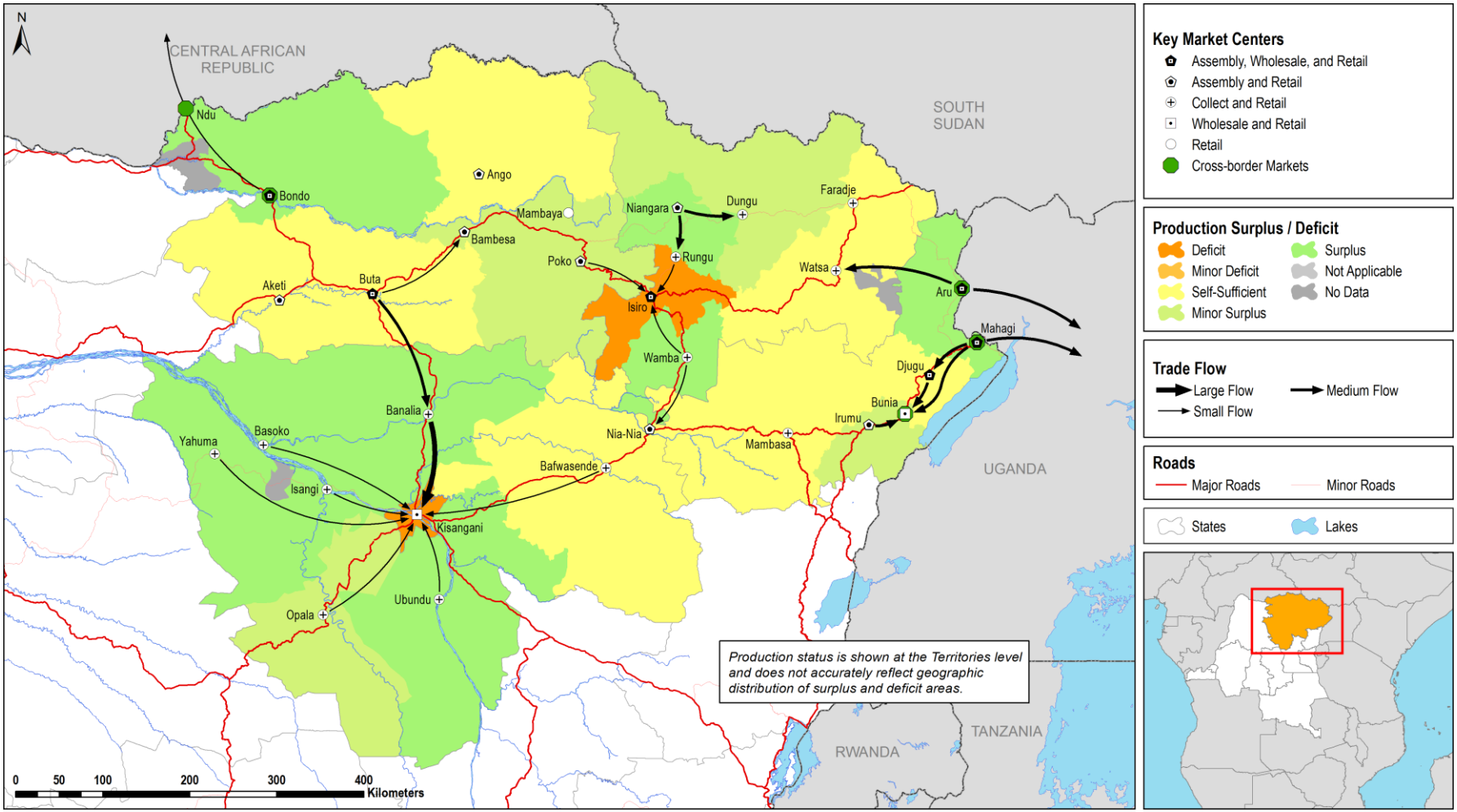
Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Farmgain Africa (2015).

Figure 51 Cassava flour prices (US$/kg) in Orientale Province, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015).

Figure 52 Orientale Province cassava production and trade flow map



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

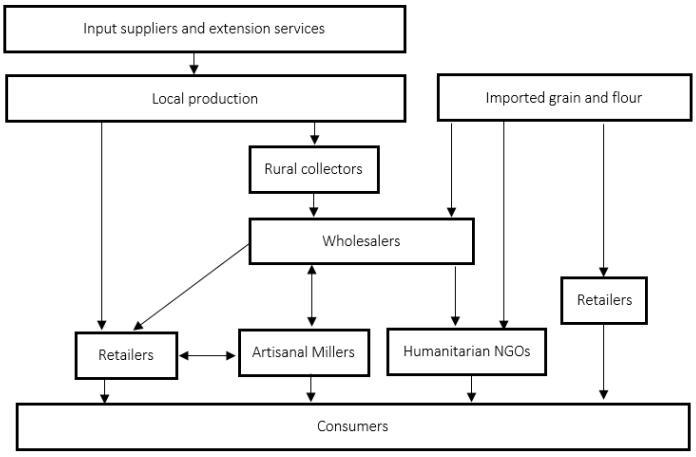
4.2 Maize markets in Orientale

Although maize is only the third or fourth most important staple food in Orientale Province, it is the second most important crop in the southeastern parts of the province, including Ituri District. Maize is consumed fresh, milled into a flour to make fufu, or milled for livestock feed. Maize is likewise used in the production of alcohol (including but not limited to beer).

Maize production in Orientale Province contributes to nearly 10 percent of national production. Within Ituri District, maize is produced in each territory, with Djugu and Mahagi the most productive. Surpluses exist in Mahagi, Djugu, Aru, Poko, Banalia and Bondo, while, Kisangani and Isiro do not produce enough to meet local needs. All other areas in the province produce either a slight surplus or are self-sufficient (Figure 57).

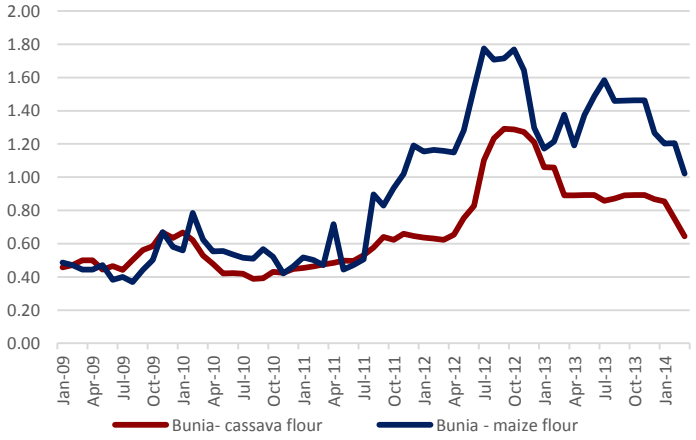
In the easternmost parts of the province, the two grades of maize flour are local and imported. Finely milled maize flour arrives from neighboring Uganda, while a coarse maize flour is produced locally. The milling capacity, or processing capacity more broadly, is quite limited in Orientale Province (and Ituri District more specifically) due to a limited and erratic power supply.

Figure 53 Maize marketing in Orientale Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

Figure 54 Maize flour and cassava flour prices (US$/kg) in Bunia town, Orientale Province, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014) and Oanda (2015).

Maize grain and flour are eaten primarily during the post-harvest months of December-February and July-September. Maize grain and flour are eaten in the whole of Orientale Province and in both rural and urban areas, and by rich and poor households. Households with high disposable incomes prefer the fine milled flour from Uganda while those with low disposable incomes (middle-income earners) mostly buy locally milled coarse flour. Maize and maize flour are often substitutes for cassava, but maize flour is far more expensive than cassava flour (Figure 54).

As for cassava, three main maize marketing basins exist in Orientale Province and roughly follow the same geographic scope:

- The largest marketing basin is around the Kisangani area in Tshopo District. Maize flows from Banalia, Isagi, Opala, Ubundu, and Bafwasende to Kisangani.
- The second marketing basin is around the Bunia area in Ituri District. Maize flows from Mahagi, Djugu, Mambasa, and Irumu to Bunia town (Ituri District). Some maize is also traded from Irumu and Mambasa to the "*grand nord*" of North Kivu Province (Oicha and Beni). Some maize flows from Mahagi to Aru and into

West Nile in Uganda; maize flour is likewise imported from western Uganda into the Bunia area. These trade patterns are similar to those observed between North and South Kivu Provinces and neighboring areas of Rwanda and Uganda.

- The third marketing basin is around the Isiro area in Haut-Uele District. This basin is small, with maize flowing from Rungu and Poko to Isiro.

More actors are involved in maize marketing channels in Orientale Province than in cassava (Figure 53). These include farmers, input dealers, extension workers, processors, wholesale traders, retail, food aid agencies (WFP), and consumers. Farmers receive extension services and purchase inputs from input dealers. After harvest, farmers sell maize to wholesalers, who in turn sell to processors (millers), retailers, and food assistance organizations such as WFP. Processors sell maize and maize flour to retailers and consumers.

Although maize and maize flour are available year-round, some variation arises in the weekly quantities traded, particularly in deficit areas. In Bunia, for example, the quantities traded per week vary from just over 30 MT during the low season (December to May) to over 60 MT during the high season (June to November) (Table 10). Likewise, some seasonal variation exists in maize and maize flour prices (Figure 55 - Figure 56).

Although maize is consumed throughout Orientale Province, there are displaced populations located in Ituri District that are accustomed to selling distributed maize flour to earn cash to purchase other items. The assessment team also found that some food assistance beneficiaries use maize flour to brew alcohol.[28]

Table 10 Estimated quantity of maize grain traded in Bunia Central Market, Orientale Province

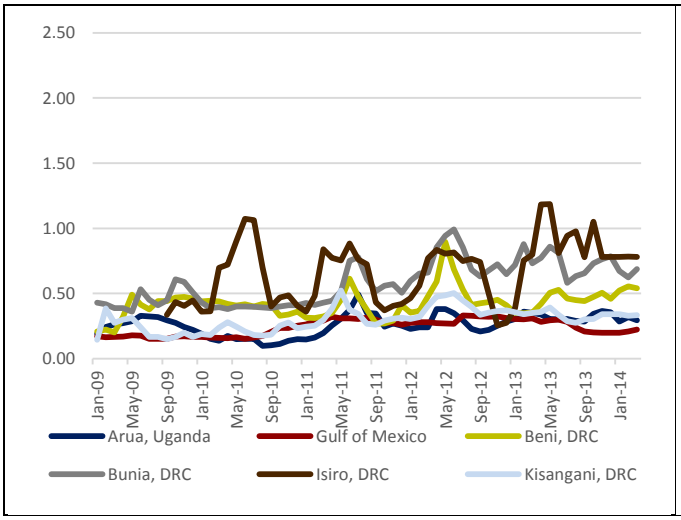
Maize [(a)]	Trucks/week	MT/truck	Weeks	Quantity
Trucks in high season (June-November)	4	10	26	1,040
Trucks in low season (December-May)	2	10	26	520
Pickups in high season (June-November)	8	3	26	624
Pickups in low season (December-May)	4	3	26	312

Note: (a) The quantities listed here refer only to the quantities traded in Bunia Central Market (one of many markets in Bunia town).

Source: Authors' calculations based on field assessment.

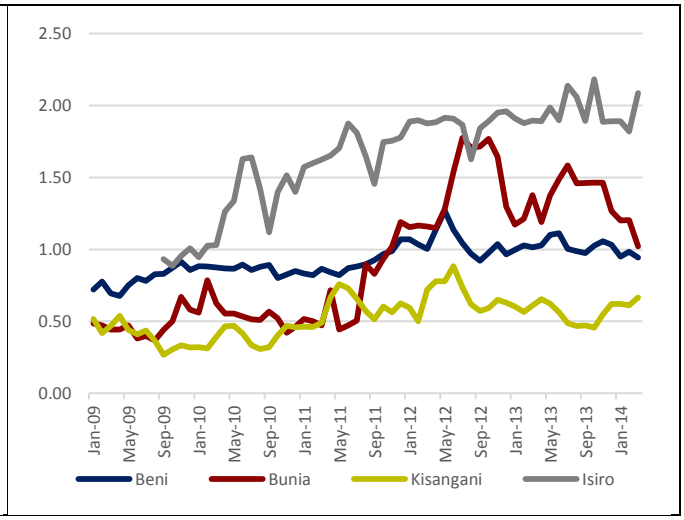
[28] Personal communication with traders in Ituri district, May 2015.

Figure 55 Maize prices (US$/kg) in Orientale Province and regional and international markets, 2009-2014



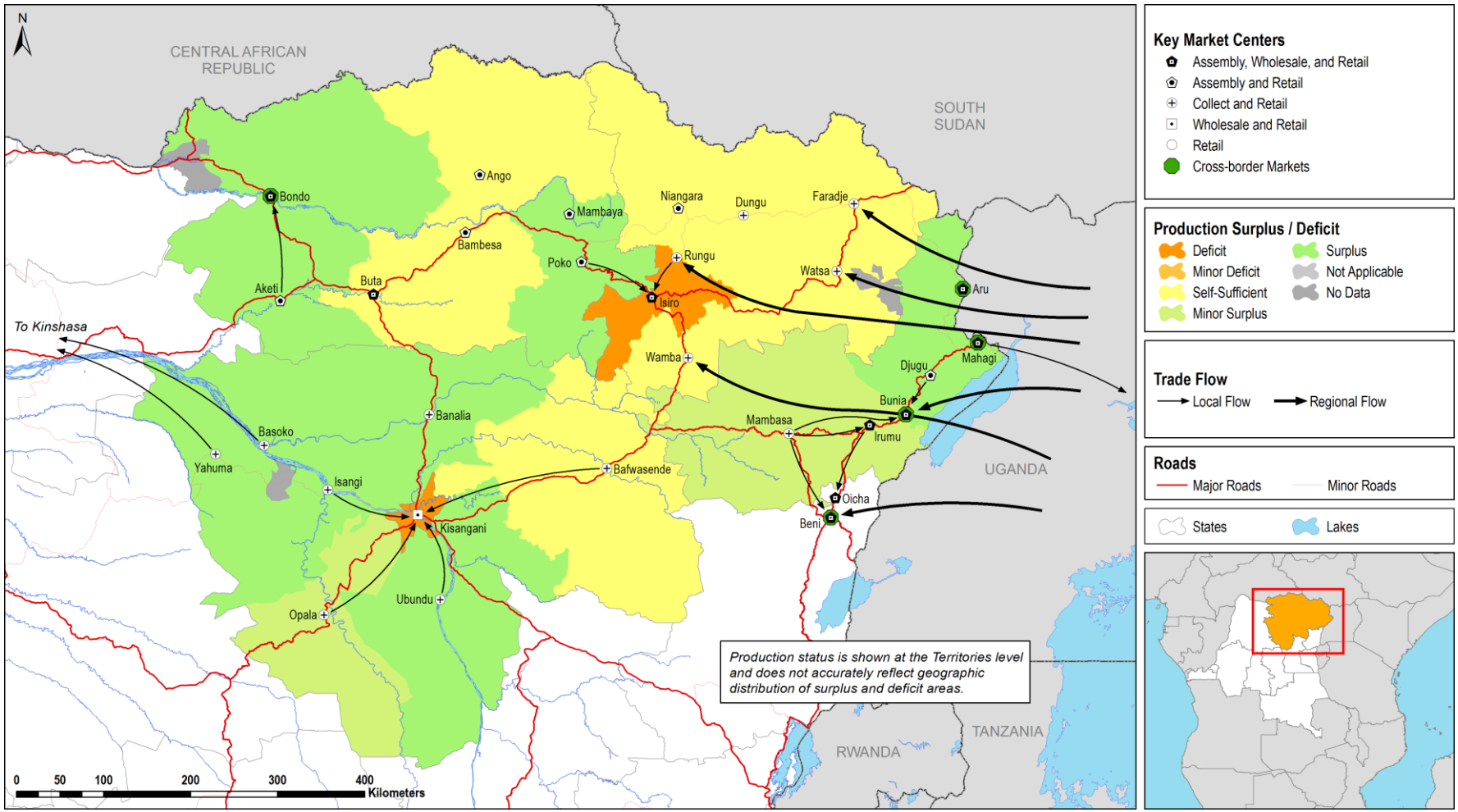
Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Farmgain Africa (2015); USDA (2015).

Figure 56 Maize flour prices (US$/kg) in Orientale Province, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014) and Oanda (2015).

Figure 57 Orientale Province maize production and trade flow map



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

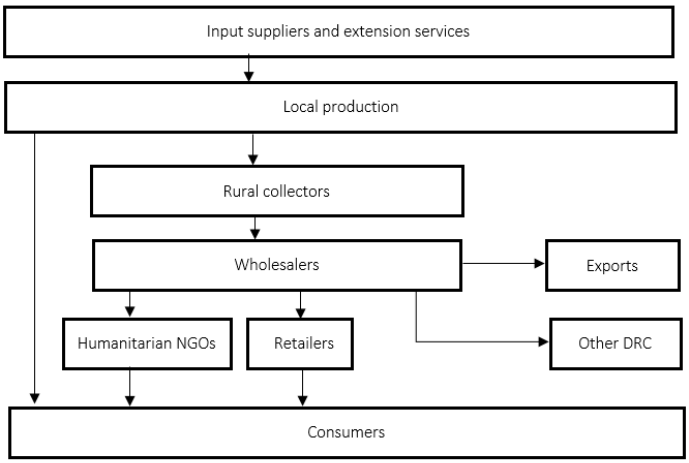
4.3 Dry bean markets in Orientale

Beans were reported to be the third most important crop in Ituri District. Boiled beans are consumed throughout the year in the whole of Orientale Province by both rich and poor households. They are substitutes for other legumes such as peas and cowpeas. Beans are a very important crop because they are eaten as a complement with all other foods, such as maize, rice, bananas, cassava (fufu and *chikwange* (steamed cassava)), sweet potatoes, and yams.

Beans are mostly produced in the northeastern part of Orientale Province. In 2011, Orientale Province produced about 16.5 MMT of beans, representing about 14 percent of total bean production in the DRC. Within Ituri District, the territories of Mahagi, Djugu, and Aru are the main producers, followed by Mambasa and Irumu. Irumu, Mahagi, and Djugu are surplus areas while Aru, Bambesa, and Buta have minor surpluses. Mambasa and Dungu are self-sufficient while Kisangani, Isiro, Banalia, Isangi, Opala, Basoko, and Poko are deficit areas.

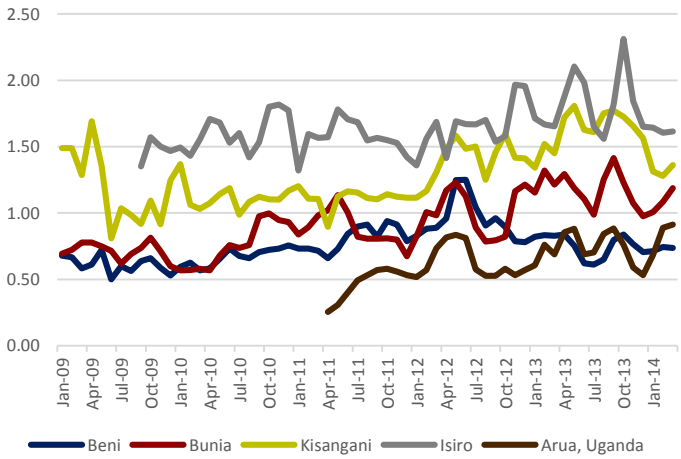
Unlike cassava and maize, beans in Orientale Province have one large marketing basin, centered at Bunia in Ituri District (Figure 60). This marketing basin spans as far west as Kinshasa, into the western part of Uganda, and south to the "*grand nord*" of North Kivu Province. Dry beans flow from Mahagi, Djugu, and Irumu to Bunia from where major shipments are taken to Kisangani, Kinshasa, and Isiro. A lot of beans also flow from Irumu to Beni in North Kivu Province from where they are transported to deficit markets of Kisangani and Kinshasa. Significant quantities of beans are transported from Djugu, Mahagi, and Aru into West Nile in Uganda. Some beans from Faradje flow northwards to Southern Sudan while some flow southwards to Watsa from where they continue to Isiro and Aru. To a limited extent, beans are exported to CAR from Bondo. A small marketing basin also exists around Bambesa, from where beans flow to the towns of Ango and Buta.

Figure 58 Dry bean marketing channels in Orientale Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

Figure 59 Dry bean prices (US$/kg) in Orientale Province and neighboring Uganda, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Farmgain Africa (2015).

The main actors in dry bean marketing include farmers, input dealers, and extension workers, while NGOs, FAO, and the government provide inputs (Figure 58). Farmers sell beans to both wholesalers and retailers. Wholesalers sell beans to retailers, exporters, consumers, and food assistance organizations such as WFP. Food assistance organizations distribute the food to consumers. The bean markets in Bunia Central Market and in Bunia town are very competitive, with over 100 traders, mostly small-scale. Although no actors are able to exert

market power, the quality of dry beans sold on markets in Orientale Province is an issue, as the high moisture content discourages purchases by some institutions.

Table 11 Estimated quantity of dry beans traded in Bunia Central Market, Orientale Province

Dry beans [(a)]	Trucks/week	MT/truck	Weeks	Quantity
Trucks in high season (June-November)	5	10	26	1,300
Trucks in low season (December-May)	3	10	26	780
Pickups in high season (June-November)	15	3	26	1,170
Pickups in low season (December-May)	10	3	26	780

Note: (a) The quantities listed here refer only to the quantities traded in Bunia Central Market (one of many markets in Bunia town).

Source: Authors' calculations based on field assessment

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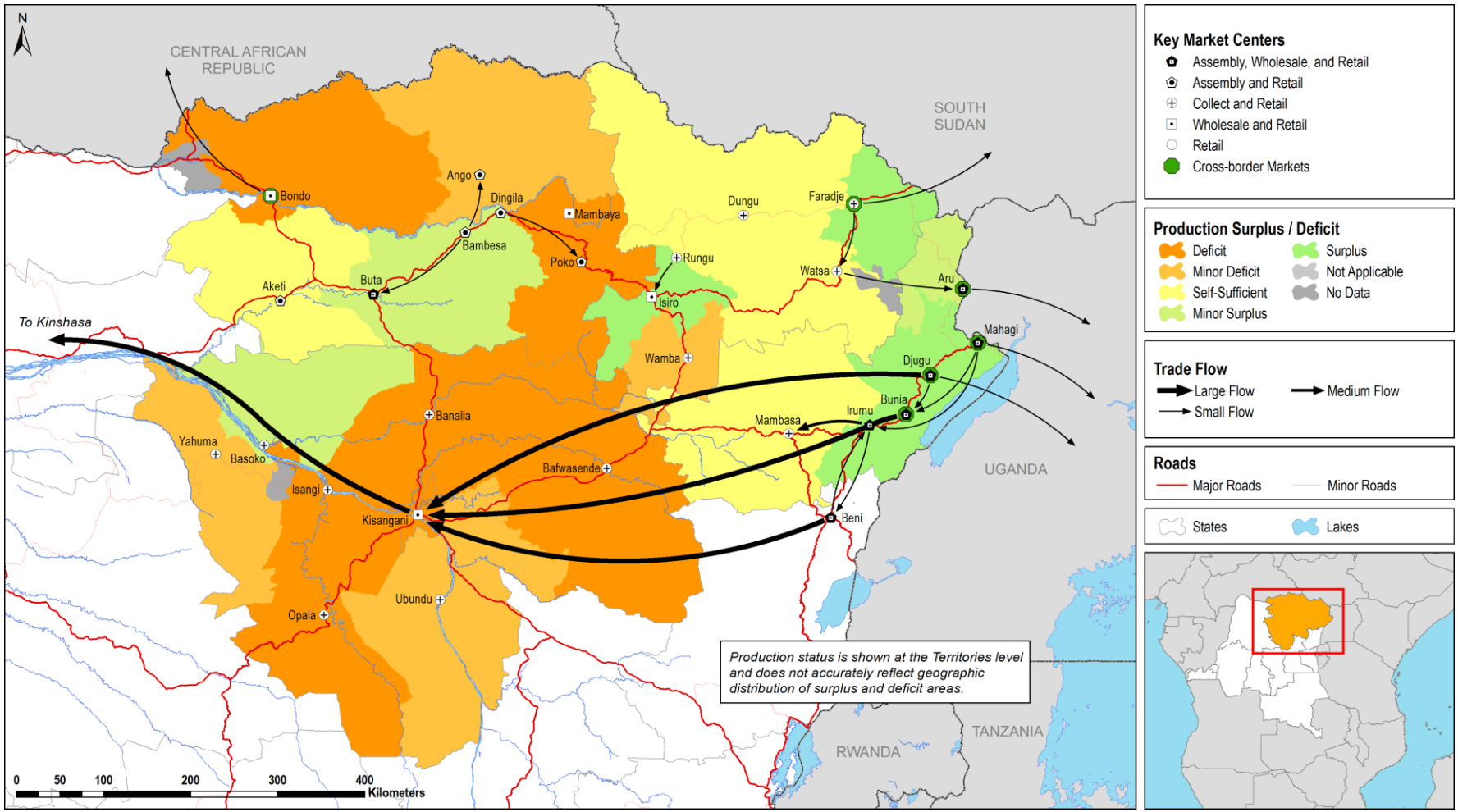
Figure 60 Orientale Province dry bean production and trade flow map

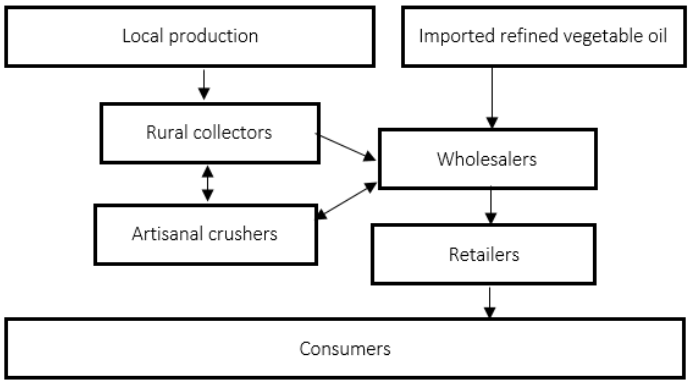


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

4.4 Edible oil markets in Orientale

Palm oil is used to cook many dishes and is therefore a complementary commodity to many crops. It is consumed throughout the year and preferred in both rural and urban areas by both the rich and poor. Local palm oil can be substituted for imported vegetable oil. The rate at which palm oil is substituted for imported oil (the income effect) increases significantly with an increase in income. Local palm oil is therefore an inferior good compared to imported vegetable oil.

Figure 61 Edible oil marketing in Orientale Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

National production figures for palm oil and many other cash crops are only available in aggregate terms. The FEWS NET assessment team found that palm oil production patterns vary considerably across Orientale Province. Isiro and Poko are surplus territories, while Bambesa and Banalia are self-sufficient, and Djugu, Aru, Kisangani, Buta, Dungu, and Bunia do not produce enough to meet local needs (Figure 62).

Palm oil has two marketing basins. The first one is centered around Kisangani in Tshopo District. In this area, palm oil moves from the main production areas of Bafwasende, Banalia, Basoko, Lokutu (Usine), Isagi, Imbono (Usine), Opala, and Ubundu to Kisangani. The second marketing basin combines the Bunia (Ituri District) and Iriso (Haut-Uele District), with the latter the main source and the former the main destination marketing basin. The Buta (Bas-Uele District) marketing basin is small and seems to be isolated from the rest of the marketing basins in Orientale Province.

Table 12 Estimated quantity of vegetable oil traded in Bunia Central Market, Orientale Province

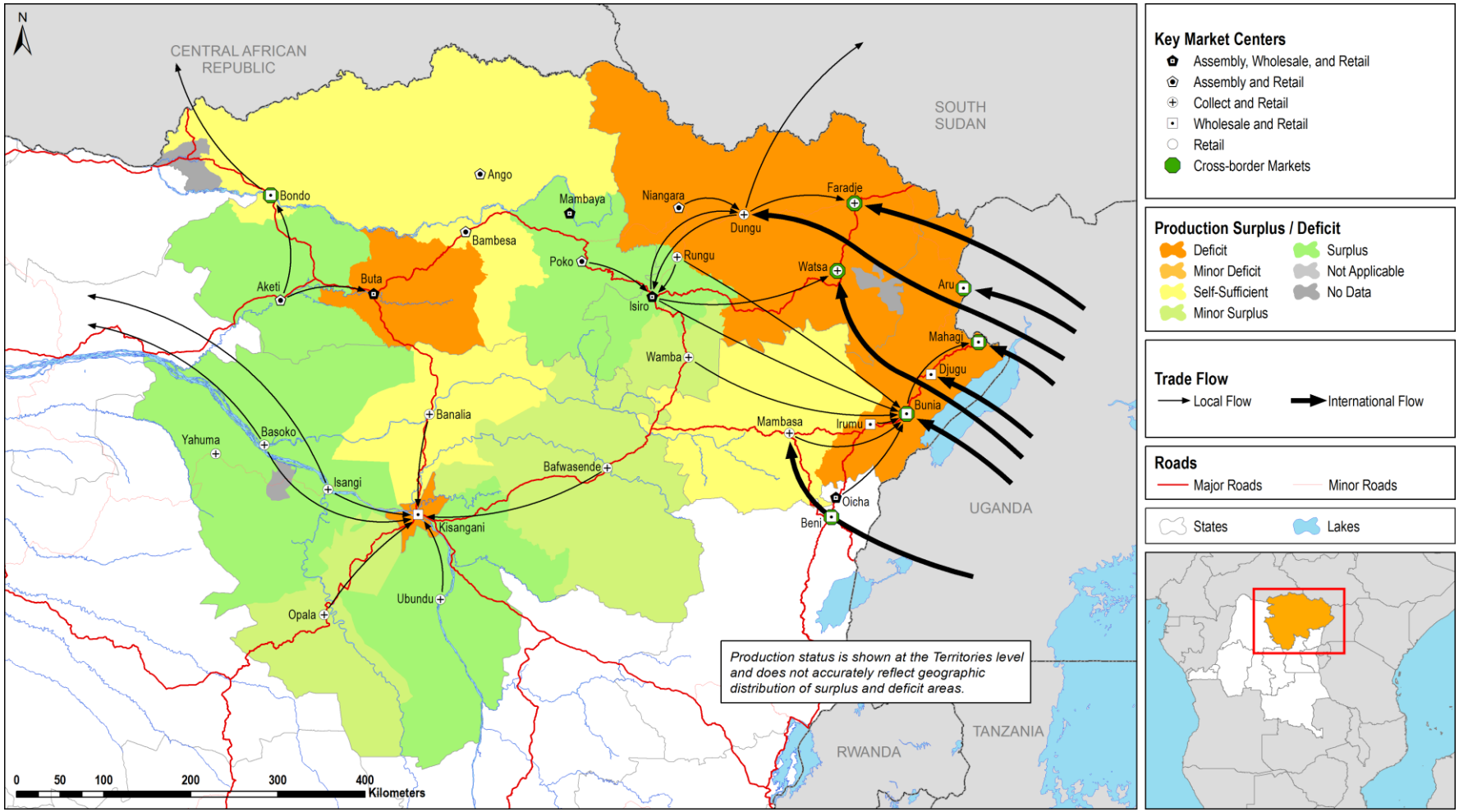
Imported vegetable oil [(a)]	Trucks/week	MT/truck	Weeks	Quantity
Trucks	3	15	52	2,340
Total				2,340
Local palm oil [(a)]	**Trucks/week**	**MT/truck**	**Weeks**	**Quantity**
Trucks in high season (June-November)	5	10	26	1,300
Trucks in low season (December-May)	3	10	26	780
Pickups in high season (June-November)	10	3	26	780
Pickups in low season (December-May)	3	3	26	234

Note: (a) The quantities listed here refer only to the quantities traded in Bunia Central Market (one of many markets in Bunia town).

Source: Authors' calculations based on field assessment.

Significant amounts of imported oil enter Orientale Province from West Nile in Uganda. The final destination markets for imported vegetable oil are Faradje, Watsa, Aru, Mahagi, Djugu, and Bunia. According to oil traders, the size of the imported oil market in Bunia Central Market is about 2,340 MT per annum. Three trucks each of about 15 MT enter the market every week from Uganda. The size of the palm oil market is estimated at about 3,000 MT per annum. In the high season (June-November), about five trucks of 10 MT and ten pickups of about 3 MT enter the market every week. In the low season (December-May), about three trucks of 10 MT and three pickups of about 3 MT enter the market every week. More than ten large-scale traders of imported oil operate in Bunia and more than 13 large-scale traders of local palm oil operate in the Bunia Central Market.

Figure 62 Orientale Province edible oil production and trade flow map



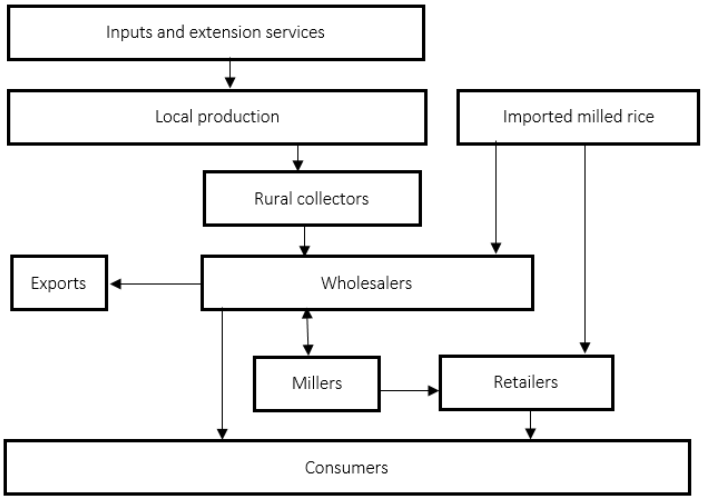
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

4.5 Rice markets in Orientale

Both local and imported rice are eaten steamed (white), boiled (white), and fried (*pilawu*). Rice is also used to make alcohol. Seasonality in local rice consumption depends on the production season and location. For example, local rice is consumed throughout the year in Tshopo District, a major rice producer, while it is consumed mostly in the months of November to February in Ituri, Haut Uélé, and Bas Uélé.

Local rice is preferred throughout Orientale Province while imported rice is preferred in urban areas. Both local and imported rice are consumed by poor and rich households. Rice-producing households in Tshopo District consume local rice almost exclusively. Both local and imported rice are substitutes for cassava, bananas, sweet potatoes, yams, and maize grain. Local and imported rice are complements with beans, vegetables, meat, and fish.

Figure 63 Rice marketing in Orientale Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

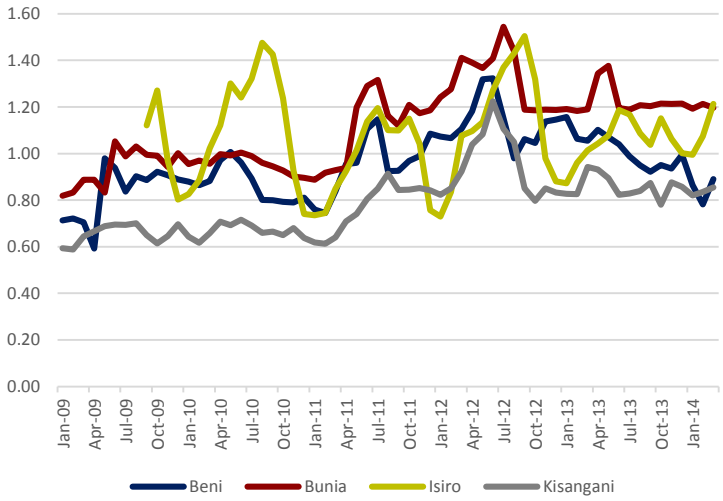
Rice is produced in many parts of Orientale Province. On average, 40 percent of all rice in the DRC is produced in Orientale Province. Local rice markets are very integrated in Orientale Province compared to those of other staples such as cassava, bananas, and maize. This could be attributed to rice's relatively longer shelf life. The largest marketing basin for rice is around Kisangani in Tshopo District. In this marketing basin, rice moves from the main production areas such as Bafwasende, Banalia, Isangi, and Opala to Kisangani. The Kisangani (Tshopo District) marketing basin is integrated with the Buta (Bas-Uele District) marketing basin, as significant quantities of rice move from Aketi to Buta, Kisangani, and the northern parts of Bas-Uele. The Buta (Bas-Uele District) marketing basin is also integrated with the Iriso (Haut-Uele District) marketing basin, since rice flows from Bambesa to Poko and up to Isiro. Finally, the major marketing basins of Kisangani (Tshopo District) and Bunia (Ituri District) are integrated, since rice flows from Bafwasende to Mambasa in Ituri District. Local rice flows from Ituri District (Irumu) to North Kivu (Beni).

Rice is imported into Orientale Province from Uganda. This rice is mostly from Pakistan or Vietnam; it is only repackaged into bags and re-exported into the DRC from Uganda. It enters Orientale Province through the Mahagi border and flows up to Aru, Mahagi, Djugu, Bunia, and Isiro. The overall implication is that local rice, beans, and imported oil can be easily procured regionally and moved to relatively larger areas in Orientale Province.

Rice markets are characterized by a much larger number of actors compared to other staple food markets in Orientale Province. The main actors in the rice marketing channel include farmers, extension workers, input providers (NGOs, FAO, and government), storage providers, processors, wholesalers, retailers, exporters, and consumers (Figure 63). Typically, the government provides extension services to farmers. The government, NGOs, and FAO also provide inputs to farmers. Farmers produce and sell rice to paddy storage owners and processors. Processors sell milled rice to wholesalers, retailers, and milled rice stores, which in turn sell to consumers. Wholesalers sell to exporters to Uganda, CAR, and South Sudan. Wholesalers also sell to NGOs and humanitarian organizations that distribute rice to consumers, for example, as food assistance.

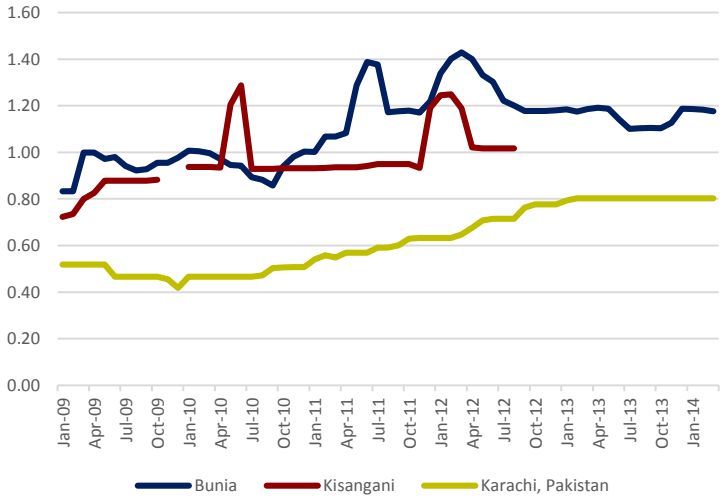
Although both local and imported rice are available in Ituri district, the number of local rice traders in Bunia is very limited. This is largely due to the prevalence of imported rice sourced from neighboring Uganda. The prices of imported rice seemed competitive and were much lower than those of local rice (Figure 64 - Figure 65).

Figure 64 Local rice prices (US$/kg) in Orientale Province and neighboring areas, 2009-2014



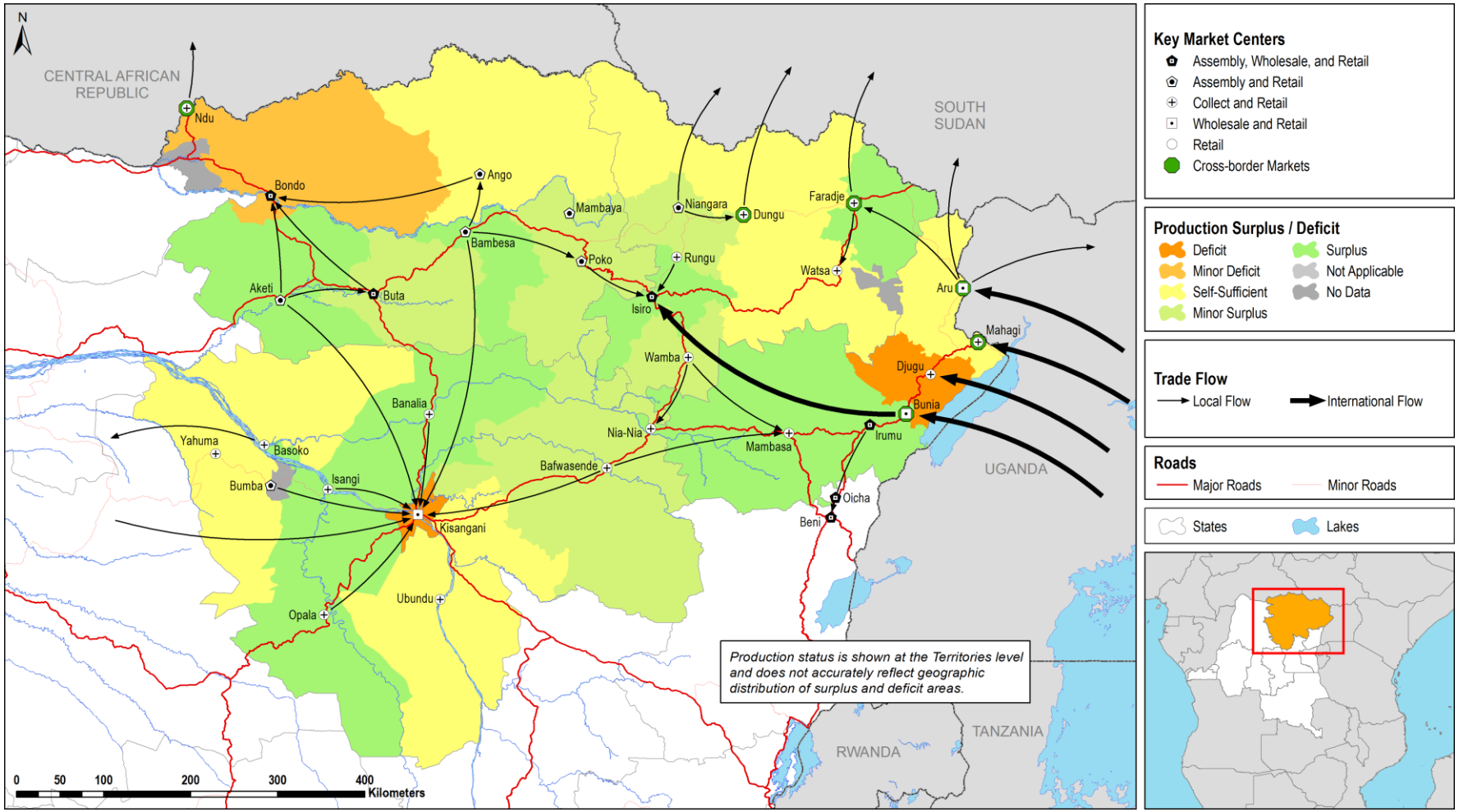
Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015).

Figure 65 Imported rice prices (US$/kg) in Orientale Province and international markets, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Pakistan Bureau of Statistics (2014).

Figure 66 Orientale Province rice production and trade flow map



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

4.6 Cooking banana markets in Orientale

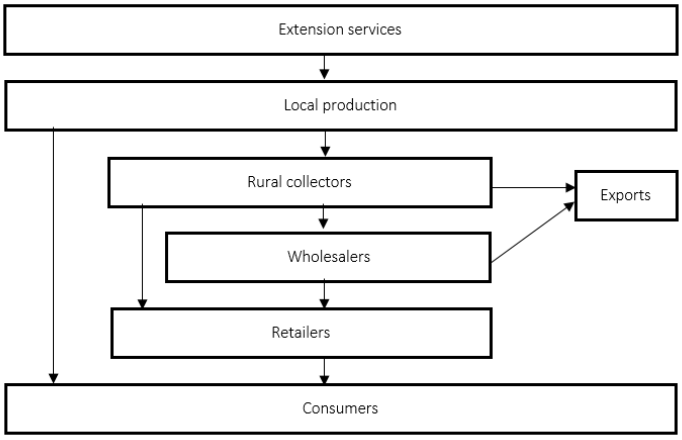
Bananas are harvested and consumed year round throughout much of Orientale Province. Plantain bananas are substitutes for cassava, sweet potatoes, potatoes, yams, and taro. They are complements with vegetables, fish, beef, beans, and other legumes.

Four types of bananas are available in Orientale Province, including plantain bananas (commonly called *gonja* in Uganda), sweet, small bananas (*ndizi* in Swahili), large, sweet bananas (*bogoya* in Uganda), and green bananas (*matooke* in Uganda). The dominant types are plantain bananas, followed by *matooke* and the sweet types. This study focuses on the plantain banana. Plantain bananas are pilled after ripening and boiled, baked, or deep fried. They are also used to produce alcohol (gin).

Bananas are widely produced across Orientale Province. On average, between 2006 and 2011, nearly half of the bananas in the DRC were produced in Orientale Province (SNSA 2012).

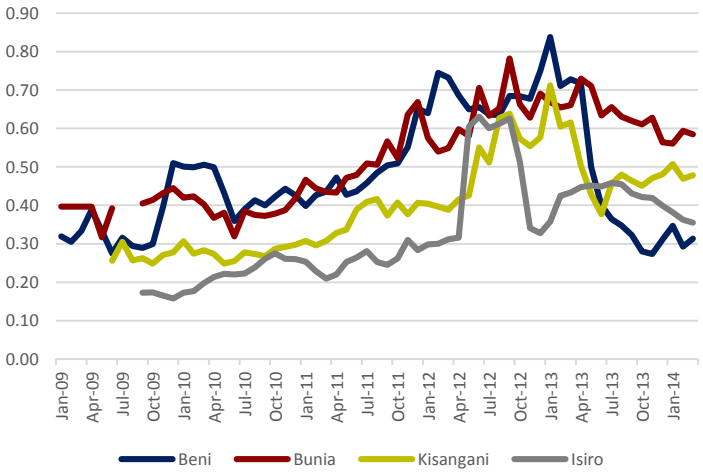
Two large and two small marketing basins for bananas exist in Orientale Province (Figure 69). The large ones are centered in Kisangani (Tshopo District) and Bunia (Ituri District) while the small ones are centered at Isiro (Haut-Uele) and Buta (Bas-Uele). In the first marketing basin, bananas flow from Bafwasende, Banalia, Isangi, and Ubundu to Kisangani. The second major marketing basin for bananas is around Bunia in Ituri District. In this marketing basin, bananas flow from Mambasa, Irumu, and Djugu to Bunia and from Mambasa and Irumu to North Kivu Province (Beni and Butembo). Some bananas flow from Mahagi into West Nile in Uganda. As with the other crops, the two other minor marketing basins are centered at Isiro in Haut-Uele and at Buta in Bas-Uele. Cooking banana prices (Figure 68) display quite a bit of seasonality, roughly following the time of year when availability is at its peak or lowest points.

Figure 67 Cooking banana marketing in Orientale Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

Figure 68 Cooking banana prices (US$/kg) in Orientale Province, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015).

The main actors in the banana marketing channel include farmers, extension workers, and NGOs and FAO disease control assistance (Figure 67). Farmers sell bananas to retailers who in turn sell to consumers. The government and development partners provide limited extension services to farmers through the Inspecteur Provincial à l'Agriculture, Pêche et Elevage. None of the many small-scale traders can influence market power in

the DRC's banana subsector, but the market is still not efficient because of other sources of inefficiencies such as poor roads, poor storage facilities, and corruption, all of which tend to increase food prices to consumers.

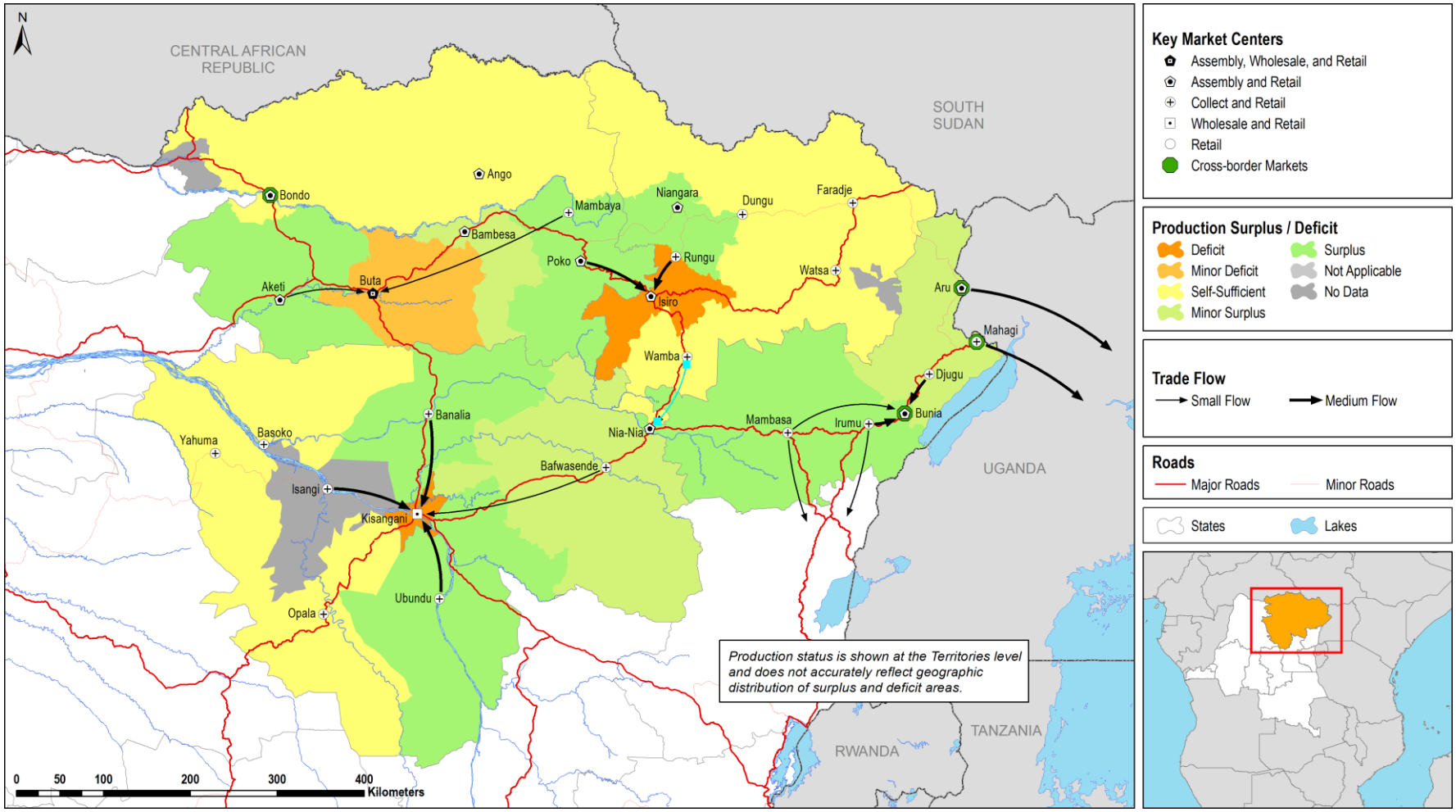
Table 13 Estimated quantity of cooking bananas traded in Bunia Central Market, Orientale Province

Bananas [(a)]	Trucks/week	MT/truck	Weeks	Quantity (MT)
Trucks in high season (June-November)	5	6	26	780
Trucks in low season (December-May)	3	6	26	468

Note: (a) The quantities listed here refer only to the quantities traded in Bunia Central Market (one of many markets in Bunia town).

Source: Authors' calculations based on field assessment.

Figure 69 Orientale Province cooking banana production and trade flow map

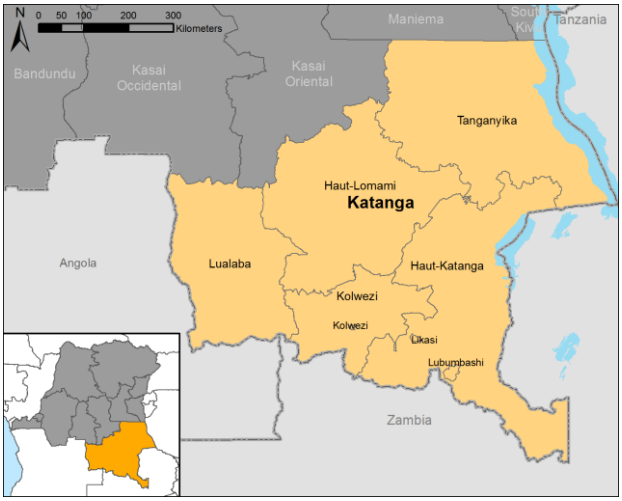


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Bunia, Orientale Province (May 2015).

5. Katanga Province

- Maize and cassava are the main staple foods in Katanga Province, a slight deviation from national trends. Other widely available staple foods include legumes (dry beans, cowpeas, and groundnuts), palm oil (local and imported), rice (local and imported), and sweet potatoes. In the northern part of the province, two distinct seasons (season A and season B) exist, much as in South Kivu Province, while in the central and southernmost districts, rainfall is unimodal, much like neighboring Zambia.

Figure 70 Map of Katanga Province



Source: Author's estimates based on FAO GAUL (2015).

- In Katanga Province, three strongly integrated main marketing basins are driven by agro-climatology, available infrastructure, and geography. The first is located in the southern Katanga Copper Belt area, which extends from the Zambian border and includes the main consumption centers of Lubumbashi and Kolwezi. Food availability in this southern marketing basin is largely dependent on commodity flows from Zambia (via the Kasumbalesa border point). The second strongly integrated marketing basin is centered around Kalemie (an important lake port) on the northeastern part of the province, and includes Kongolo, Kabalo, Nyunzu, and Moba as well as markets in Tanzania (including the lake port of Kigoma). The third main marketing basin is located in the central-western part of the province, bordering Kasaï Oriental Province. The demise of the national railway system has led to more localized marketing basins, whereas in the past, trade flows spanned larger distances across the province.
- Trade linkages with neighboring Maniema were historically stronger than they currently are, largely due to the lack of transportation options (railroad) and reduced production as the local mining sector grew. Likewise, some limited trade flows between Katanga and South Kivu Provinces via Lake Tanganyika.
- Three areas of Katanga Province are relatively isolated and hence only indirectly involved in the three marketing basins described above. The first is located in the central-eastern part of the province, centered around Pweto. Some trade occurs between Pweto and Lubumbashi and Moba, as well as neighboring Zambia, but those market linkages are quite limited. The second is also in the central-eastern part of the province and includes the towns of Manono and Mitwamba. This area is isolated mainly due to frequent conflict and insecurity. The third is located in the southwestern part of the province, including the western part of Lualaba District, areas that border Angola.
- Katanga Province production is surplus in groundnuts (trade flows go as far north as Bukavu, South Kivu Province), self-sufficient in cassava, and structurally deficit in all other commodities, including maize, the most important staple food consumed in Katanga Province. Other commonly consumed foods include dry beans (a mix of cowpeas, mixed dry beans, and dry green beans), palm oil (unrefined, locally produced palm oil, and refined imported palm oil are easily substituted), and rice (locally produced and imported from both regional and international markets).

Table 14 Sources of commodity supply (MT) in Katanga Province

	Cassava	Maize [b]	Dry beans [c]	Edible oil [d]	Milled rice [e][f]
Local production [a]	2,761,782	855,000	16,070	5,000	7,461
Imports [g]	0	1,995,000	37,497	10,000	141,753
Other DRC supply	negligible	negligible	negligible	negligible	negligible
Total Supply	2,761,782	2,850,000	53,567	15,000	149,214

Note: (a) Local production based on average 2005-2011 data unless otherwise specified.
(b) Maize production and import volumes were estimated during the FEWS NET stakeholder workshop and are much larger than official government estimates.
(c) Dry beans are sourced from Tanzania.
(d) Oil imports consist mainly of refined vegetable oil, sourced from international markets.
(e) Milled rice assumes a milling rate of 65%.
(f) Imports of milled rice are mostly formal flows rice from international markets that transit through Zambia and informal flows of Tanzanian rice.
(g) Imports are from international or regional markets, from or via Zambia and Tanzania.

Source: Authors' calculation based on SNSA (2012), FAO STAT (2015), AGRER (2006); FEWS NET workshop proceedings Lubumbashi (May 2015); OCC (2015); Traffics (2015); O'Donnell, Cook, and Magistro (2015); FEWS NET ACTESA Cross border trade database (2015).

Table 15 Average agricultural production (kg) per capita in Katanga Province, 2006-2011 [a]

Province/District	Maize	Rice [b]	Cassava	Banana	Dry Beans	Edible Oil [c]
Katanga	22.84	1.09	262.63	1.02	0.54	0.0005
Haut-Katanga	21.22	0.59	269.67	1.12	0.80	N/A
Haut-Lomami	15.40	0.25	311.54	0.91	0.31	N/A
Lualaba	11.48	1.08	249.74	0.66	0.18	N/A
Tanganyika	61.01	4.86	510.30	2.43	1.45	N/A

Note: (a) Province-level per capita averages were calculated based on the entire provincial population; district-level per capita averages were calculated after excluding urban populations in the district as many urban centers comprise distinct districts with near-zero production.
(b) Paddy rice.
(c) Production data only available at the province level.

Source: Authors' calculations based on SNSA (2012), Akakpo, Randriamamonjy, and Ulimwengu (2014), and FEWS NET (2015a).

Table 16 Ranking of commodities consumed, in order of importance, by district in Katanga Province

Product/District	Haut-Katanga	Haut-Lomani	Lualaba	Tanganika	Kolwezi
Cassava	4	2	1	2	3
Maize grain/flour	1	1	2	1	1
Dry beans	3	3	3	3	4
Rice-local	5	4	N/A	4	N/A
Rice-imported	2	5	4	5	2

Legend Rank 1= Most important, 5 = least important, N/A = not consumed or limited consumption.

Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

- Conflict has been a persistent issue in the northern and central parts of the province and has forced thousands of people to leave their homes.[29] More than 45,000 people were displaced in Malemba-Nkulu, Mitwaba, and Manono between April and June 2015 alone (USAID/OFDA 2015b). The total displaced population in Katanga was estimated at over 300,000 as of June 30, 2015 (USAID/OFDA 2015b; OCHA 2015). The most conflict-afflicted towns are located in maize deficit areas that are either linked with markets in other surplus-producing areas (such as in Nyunzu), or are relatively isolated and rely on limited local supplies (such as in Malemba-Nkulu, Mitwama, and Manono). Persistent levels of insecurity in these areas limit the

[29] This includes the areas in and around the town of Nyunzu in the north and Malemba-Nkulu, Mitwaba, and Manono in the central areas of the province.

availability of supplies by disrupting local production capacity and trade flows. Evaluations conducted by humanitarian organizations found that more than 80 percent of affected households were experiencing a lack of access to fields and markets (USAID/OFDA 2015a). Recent assessments indicate that many IDPs from Mitwamba territory have returned to their homes since the beginning of 2014, but they face many challenges that may in turn affect local agricultural production and market activities.

- The effects of conflict have led to a north-to south migration to the southern area of the province, mainly Lubumbashi. A more abrupt influx of IDPs from South Kivu Province migrating to the same areas has also occurred. As a result, Lubumbashi and its surrounding area's population density and consumer demand continue to grow, setting it apart structurally from the rest of the province. More than half of the entire population of Katanga Province (approximately 9 million) now lives in the greater Lubumbashi area.
- Agricultural production in Katanga Province is largely driven by small-scale, subsistence agriculture, practiced by roughly 75 percent of the rural population. Most production is rainfed, with limited use of improved inputs or mechanization. The majority of production is therefore vulnerable to rainfall variation. Increasingly large-scale, modernized production systems, particularly for maize, are arising in the greater Lubumbashi area. These modern agricultural production systems often include more than one crop, including oilseeds like soy (for livestock feed) and palm as well as fruit orchards, and are also often part of a vertically integrated production system for either maize flour (for direct human consumption), beer brewing, or livestock feed (for soy in particular). Three main growing seasons occur in the year, with the most important one taking place from December to March, which corresponds with the main season in Zambia.
- As an import-dependent province, important staple food flows exist across borders with Zambia at Kasumbalesa and Pweto, and with Tanzania at Kalemie. At both border points, the direction of flow of food is almost exclusively into the DRC, but the flow volume, level of formality, and degree of regulation at each of these important border markets vary widely. High regulation costs and time requirements, along with the lack of infrastructure and capacity to prohibit flows to bypass the formal border checkpoint at Kasumbalesa, have encouraged the informal, unregulated flow of almost all staple food across the border, in small quantities (accounting for approximately 90 percent of all flows into the DRC at this border point).[30] The deficiency of production and higher prices in Kasumbalesa and the surrounding areas also create food security and price incentives for the DRC to allow the informal flows of staple food from Zambia. In contrast, the staple food flows from Tanzania at Kalemie are almost entirely formal, regulated, and large-scale. Located on the shore of Lake Tanganyika across from Tanzania, it is more feasible to physically monitor all flows coming into Kalemie from Tanzania. One small-scale and one large-scale port in Kalemie are the only places where boats can dock. The large port is challenged by its deteriorating public infrastructure, much of which is no longer functional, despite some support from the private sector. Maize flour, palm oil, and beans are the main food commodities imported from Tanzania to Kalemie, in addition to many processed food items.
- The state of local transport and infrastructure is dichotomous in Katanga Province: while both are in good condition around Lubumbashi, they are in very poor condition throughout the rest of the province. Outside of Lubumbashi, roads between markets, production centers, and consumption centers are in poor condition and often not safe for travel. Transport of supplies is very time-consuming and the roads are sometimes impassable, inhibiting the flow of produce from farms to and between markets. The roads linking Lubumbashi with Kasumbalesa, the market on the Zambian border, to the south and with Kolwezi, to the north, are in good condition and secure, enabling large trucks and a high volume of traffic to pass. The

[30] Personal communication with border officer, May 2015.

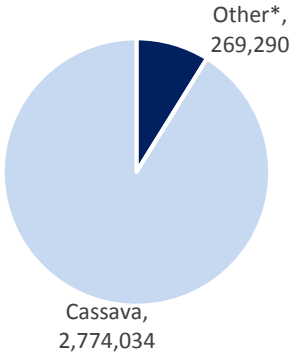
national railway is underfunded and is not a reliable mode of transport as it runs on a highly irregular schedule, which is not conducive for supporting marketing by the private sector.

- Storage is generally not available outside of major consumption centers, making it difficult for the private sector to smooth local availability over the course of the year. The greatest storage capacity is in the southern part of the province, particularly in the greater Lubumbashi area (Annex 6). Storage capacity at the province's major border crossing points varies considerably. In Kasumbalesa, there is very limited storage. Formal trade flows are often left on the truck for days while the transporter waits to receive approval to cross the border, before continuing on to the greater Lubumbashi area. Informal trade flows arriving via Kasumbalesa by small-scale traders are often stored in traders' homes. In contrast, in Kalemie there is a moderate amount of storage capacity at the port, while local FEC members maintain storage facilities throughout the town.
- Processing infrastructure is very concentrated in Lubumbashi where large industrial plants are located. Maize and cassava, the main staple foods for the province, are largely milled artisanally elsewhere and a large volume of industrially milled maize flour is imported from neighboring Zambia and Tanzania. These challenges contribute to an agricultural production system that is not systematically competitive enough (from a price perspective) to encourage local production in the presence of less expensive imports from Zambia and Tanzania in particular.
- An important activity and source of income in the province, mining has impacted agricultural production and the agricultural system as a whole. Mining has long been a dominant sector in the southern part of the province due to the mineral supplies, proximity to infrastructure and markets in the Copper Belt region of Zambia, and the lack of agricultural production activities in the area. The growth of the mining sector and agricultural production in the northern area have a strong inverse relationship. Production in the northern area used to be much greater but has recently declined as mining activities increased. The recent influx of mining company purchase stations in the northern area provided income opportunities for artisanal mining, which has higher returns than agriculture given the high transaction and transport costs in the agriculture system created by poor infrastructure. This has drawn much of the farming population into mining and transformed the area from one of subsistence farming to a market-based area as more of the population relies on markets for food supplies.
- The structure of staple food markets is generally competitive in Katanga, in that individual actors are not able to exert market power and barriers to entry to agricultural production and marketing are fairly limited. Although there are many actors at nearly every level of the marketing chain, this does not mean that commodity prices themselves are particularly competitive elsewhere in the DRC or regionally. Evidence in support of this notion includes the very low (or nonexistent) volumes of trade from Katanga toward neighboring provinces and the large volumes of relatively cheaper imported commodities (particularly for maize, dry beans, and rice) from neighboring Zambia and Tanzania.

5.1 Cassava markets in Katanga

Cassava is the most important staple food produced in Katanga Province (Figure 71). However, in terms of aggregate consumption it has been gradually replaced by maize, especially in the major consumption areas. Production levels in the province meet aggregate needs, making Katanga Province self-sufficient in cassava. The main producing areas are in the upper northeast (Kabalo and Kongolo areas), lower southeast corner (bordering Zambia), and the central to southwest side of the province bordering Angola. Cassava is a very resilient crop and can survive drought and flooding, making it an easy crop to grow and an important source of food for very poor farmers. Cassava is largely produced for household consumption, making trade flows far more limited for cassava than for other crops (Figure 75). Within the province, cassava flows by train, truck, or bike from the central, surplus areas south to the consumption centers of Likasi and Kolwezi, which are located in the cassava-deficit area. Some limited amounts are exported to neighboring provinces (Kasaï Oriental, Maniema, and South Kivu Provinces) as well as to Angola. Some flows may occur along the Zambian border as well, but the volumes of cassava traded are small and highly localized.[31]

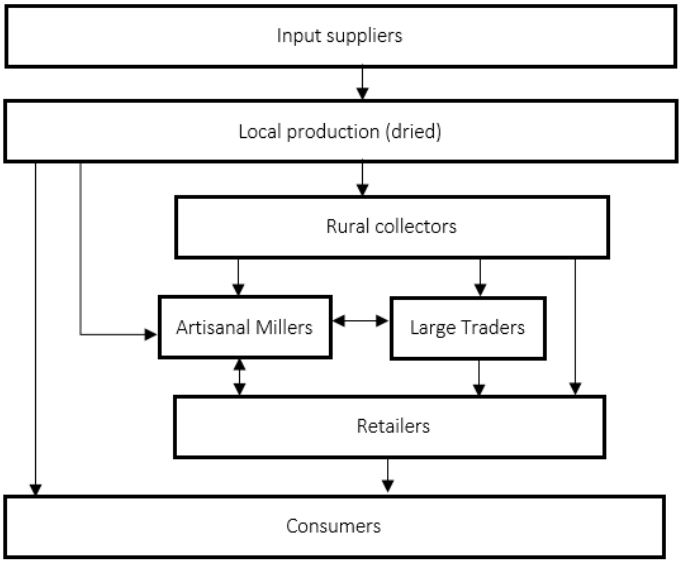
Figure 71 Average production (MT) in Katanga Province, 2006-2011



Source: Authors' calculations based on SNSA (2012).

Note: *Other includes maize, rice, dry beans, and banana.

Figure 72 Cassava marketing in Katanga Province

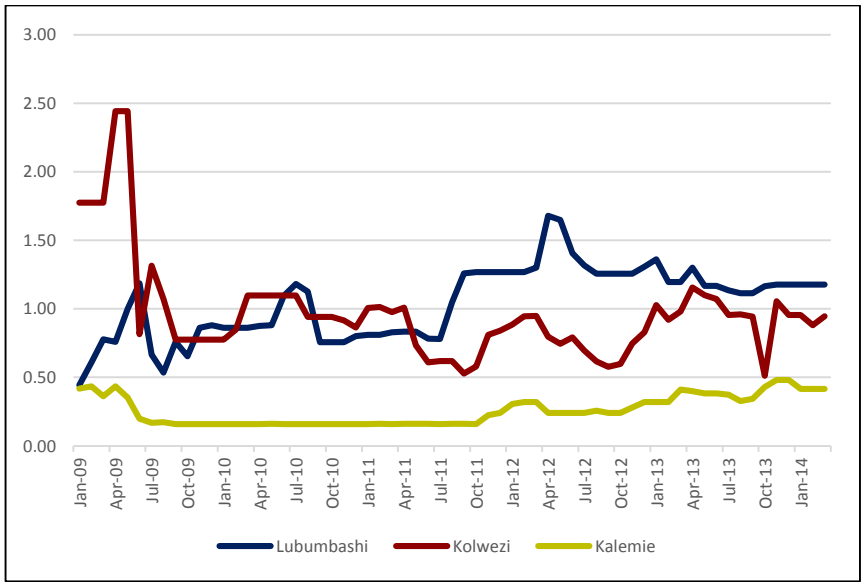


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

Like maize, cassava is primarily consumed as flour. The household-consumption orientation of cassava makes the marketing channels fairly short and simple, with only artisanal processing involved. Small women's assembly groups form the focal point of the cassava value chain. Ten percent of local production goes to fresh consumption (less than one percent) and the brewing industry, while the majority (approximately 90 percent) is pooled and bought in dried form by these groups, who mill the dry cassava into flour themselves or pay a local artisanal miller to do so, and then sell the cassava flour on the markets or to wholesalers. Wholesalers then export or process the dried cassava for local sale.

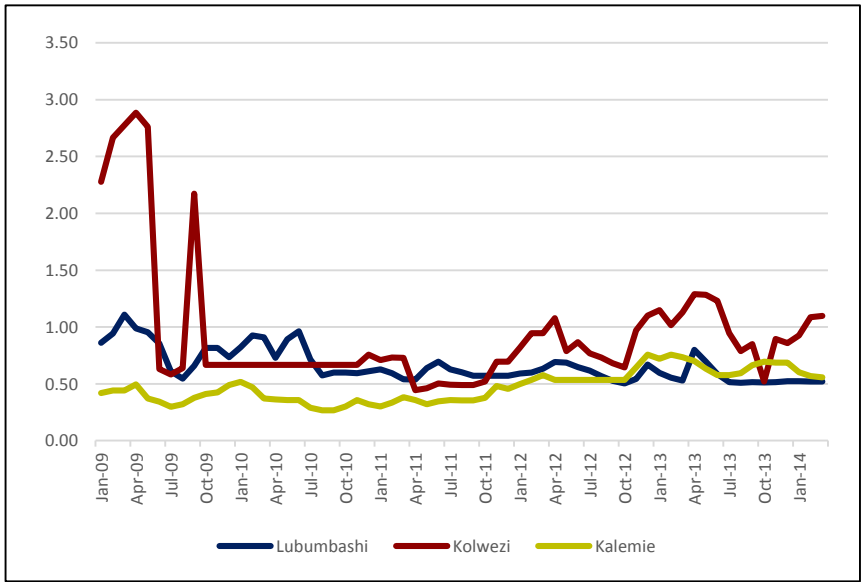
[31] This statement applies to cassava only, as Zambia is an important source of other commodities (including but not limited to maize) in Pweto.

Figure 73 Cassava prices (US$/kg) in Katanga Province and regional markets, 2009-2014



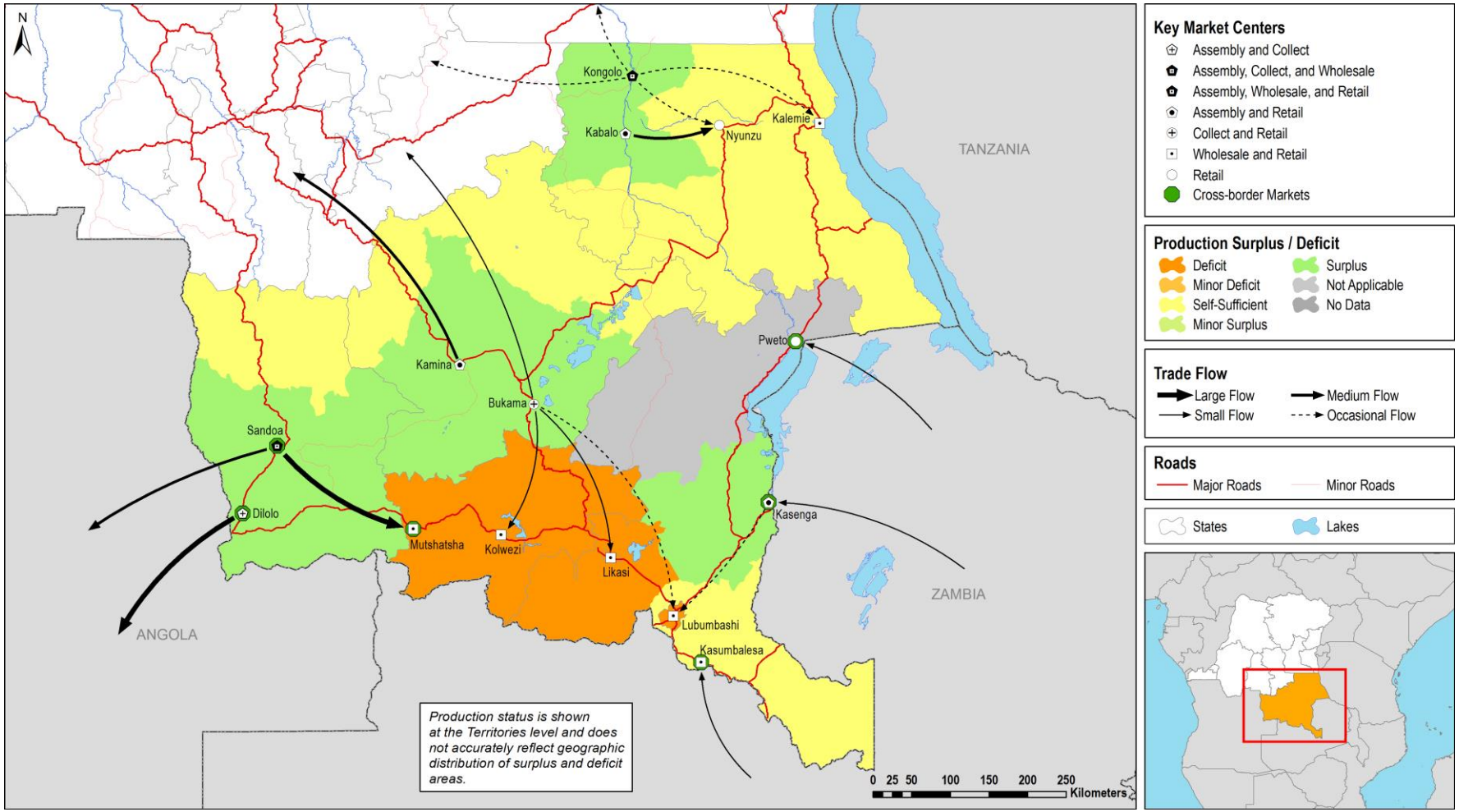
Source: Authors' calculations based on FAO AND MADR (2014) and Oanda (2015).

Figure 74 Cassava flour prices (US$/kg) in Katanga Province, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014) and Oanda (2015).

Figure 75 Katanga Province cassava production and trade flow map



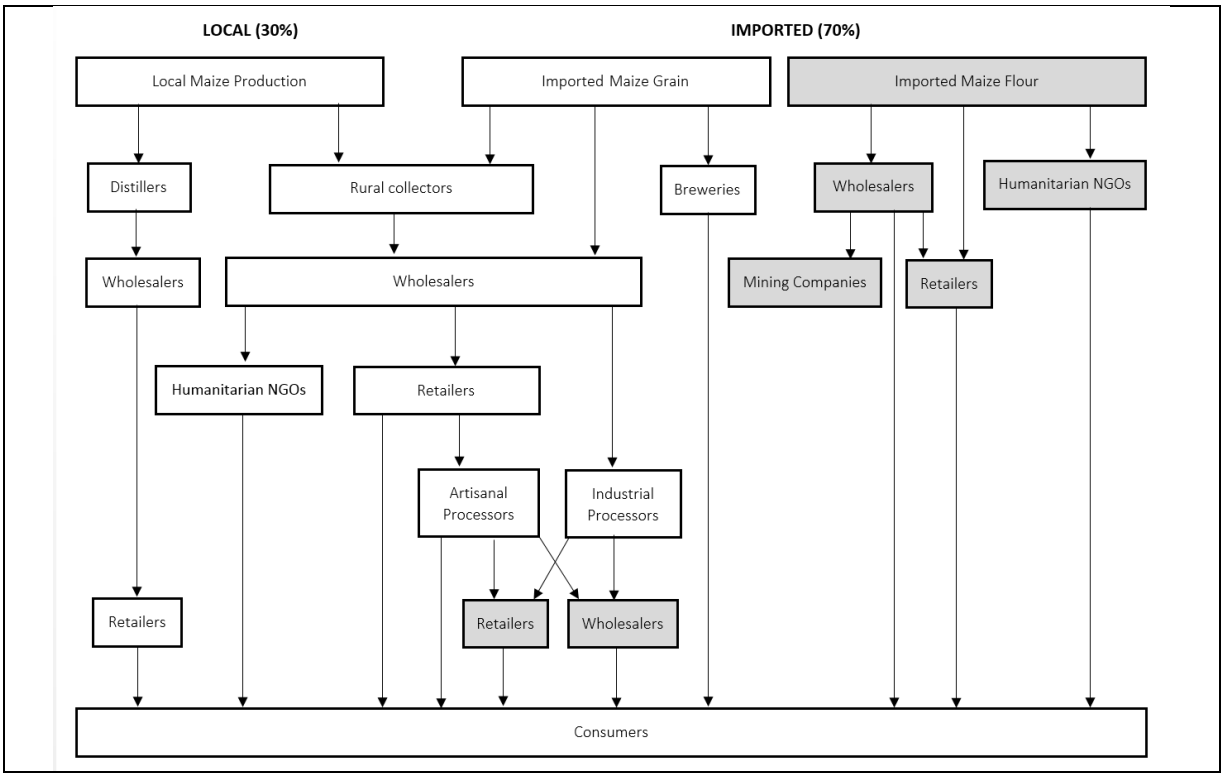
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

5.2 Maize markets in Katanga

Katanga Province is structurally deficit in maize production and imports large volumes of maize, mostly in the form of flour (maize meal), from neighboring Zambia and Tanzania (Figure 80). Therefore, while maize is the second most important crop produced in Katanga Province, total maize supply and consumption is believed to now exceed that of cassava (Table 14). The main surplus-producing territories are located along the northern edge of the province, including Kaniama, Kabongo, Kabalo, and Kongolo, which border the Kasaï Provinces, and Moba territory, located on Lake Tanganyika on the eastern side of the province. As in other parts of the country, maize is primarily consumed in the form of fufu, which is made from maize flour.

With local maize contributing only 30 percent of the total maize supply in Katanga Province and the remaining 70 percent coming through flows from Tanzania and Zambia, the cross-border flows and linkages are very strong (Figure 76 and Figure 79). Overall, maize trade flows in Katanga Province are generally from the few surplus areas and neighboring Tanzania and Zambia to the province's main consumption centers, and to Kasaï Oriental and Occidental Provinces. In the southern half of the province, flows are oriented toward the larger consumption centers of Lubumbashi and Kolwezi from neighboring Zambia and Tanzania, as well as the western part of the province. An estimated 80-90 percent of the maize sold in Lubumbashi is from Zambia. In the northern half of the province, maize flows seasonally from production surplus areas to consumption centers in neighboring deficit areas, including Kalemie and Kamina, as well as to the Kasaï Provinces to the northwest year-round, and from Tanzania to Kalemie (Figure 80).

Figure 76 Maize marketing in Katanga Province



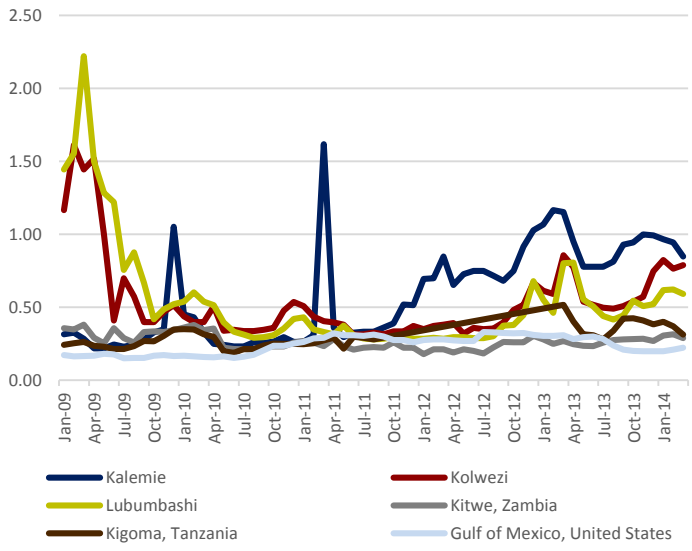
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

Note: Marketing chain elements shaded in grey are for maize flour.

Maize marketing channels vary across the province. In Lubumbashi and Kolwezi, marketing channels are vertically integrated with small- to large-scale producers, processors, and traders. Large-scale producers in these areas are more modern, using inputs imported from Zambia or South Africa, and are part of a vertically integrated production system for either maize flour (for direct human consumption), beer brewing, or livestock feed (for soy in particular). Outside of Kolwezi and Lubumbashi, processing plants are limited and much smaller and production is mainly small-scale. For this reason, milling is largely done at an artisanal level and a great deal of maize flour is imported from Tanzania and Zambia, where processing is much more developed.

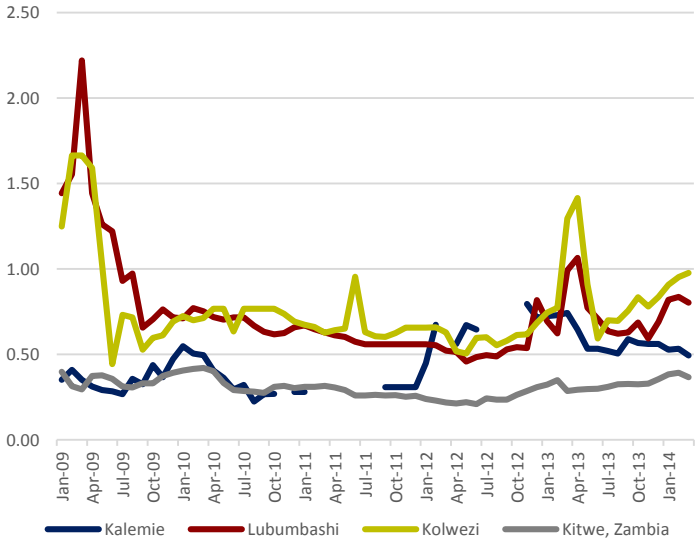
Local production is estimated to contribute only 30 percent of total maize grain supply in Katanga Province. Of local production, 2-3 percent is saved as seeds (usually 15-25 kg of 800 kg are used per hectare), 5 percent is consumed as fresh maize, up to 10 percent is processed and consumed as local alcohol, 2-3 percent is estimated as post-harvest losses, and 80 percent is sold to wholesalers. Retailers purchase maize grain from wholesalers (intermediaries) and have it milled into flour by "*moulins domestiques*" (household-level maize mills), with only a small percentage going to industrial processing. Of imported maize grain, the majority (approximately 90 percent) goes to industrial mills and small percentages go to artisanal processors and livestock production. There are intermediaries between processors and consumers along each marketing channel.

Figure 77 Maize prices (US$/kg) in Katanga Province and regional and international markets, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Tanzania Ministry of Industry, Trade and Marketing (2014); Zambia Central Statistics Office (2014); USDA (2015).

Figure 78 Maize meal prices (US$/kg) in Katanga Province and regional markets, 2009-2014

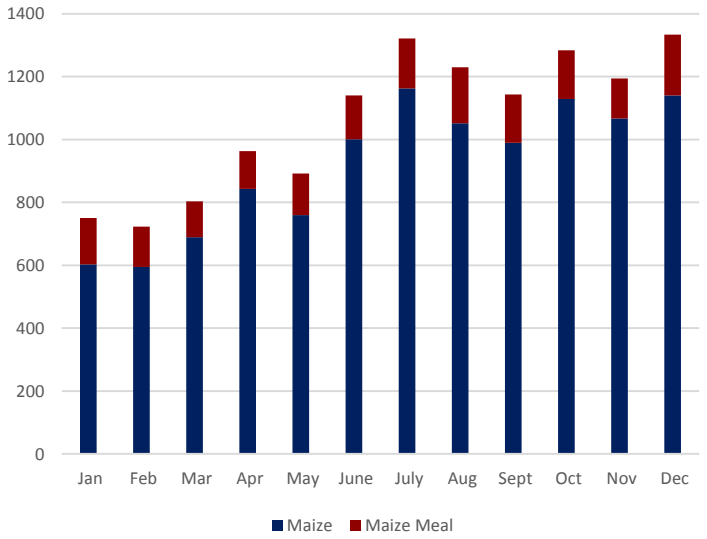


Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Zambia Central Statistics Office (2015).

Mining companies mostly buy maize flour from intermediaries because of agreements with the government that prohibit them from importing directly. Mining companies are required by the provincial government to cultivate 500 ha of maize as a way to support diversity in the provincial economy and limit dependency on mineral extraction. Mining companies often meet this requirement through sharecropping or interlinked cropping arrangements with rural populations in which the company rents land and provides inputs to producers. The producers then repay the company in-kind at the time of harvest at a pre-agreed-upon price. By supporting cultivation of land that was already being cultivated, these schemes may help augment yields but do not contribute a significant additional amount to local food availability.

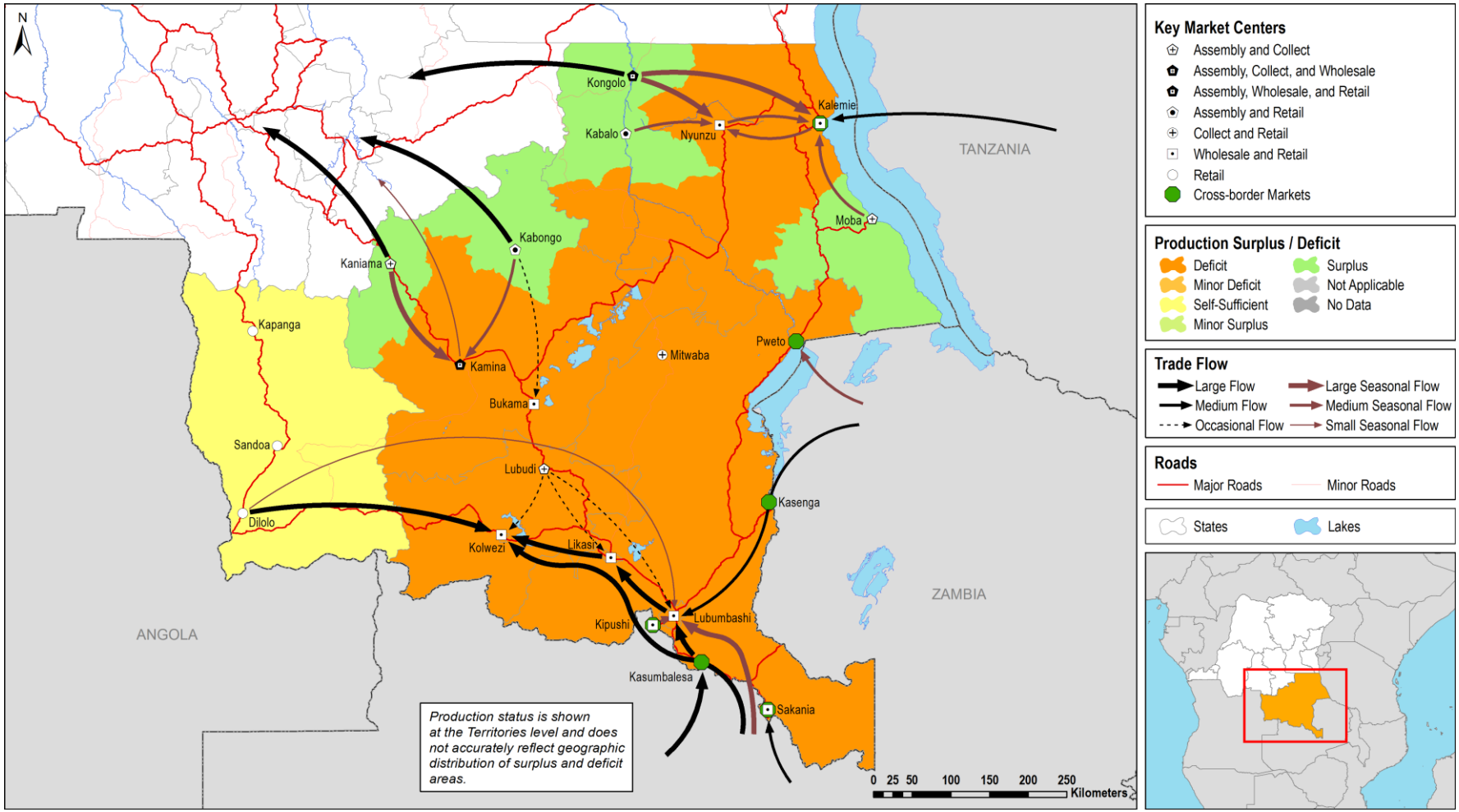
Humanitarian organizations import maize flour and purchase maize grain from local markets. WFP and other humanitarian organizations import directly themselves. The WFP imports an estimated 70 percent of its maize supplies and purchases the remaining 30 percent from local sources.

Figure 79 Average monthly informal maize and maize meal imports (MT) from Zambia, 2012-2014



Source: Authors' calculations based on ACTESA database (2015).

Figure 80 Katanga Province maize production and trade flow map



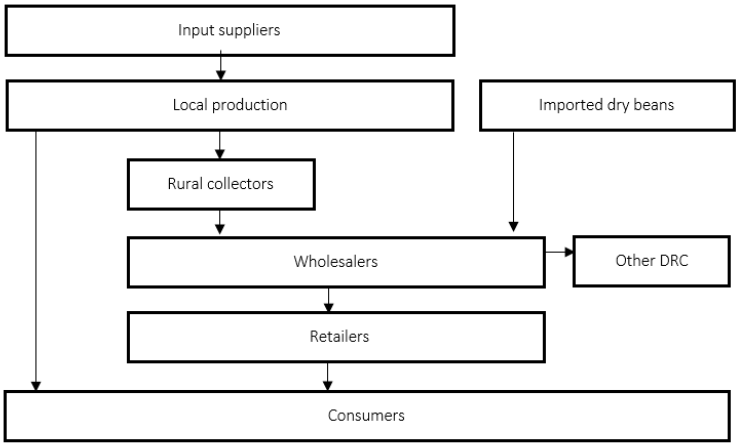
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

5.3 Dry bean markets in Katanga

Beans are an important staple food in Katanga Province and include a mix of cowpeas, mixed dry beans, and dry green beans. The surplus-producing areas are mostly located in the central and northern areas bordering Kasaï Oriental Province. Located in the surplus areas, Likasi supplies beans to Kolwezi and Lubumbashi. Important flows of beans occur from Moba up Lake Tanganyika to Kalemie, which then flow west to deficit areas of Nyunzu and Kongolo. Beans also flow to the neighboring Kasaï Provinces from the northern territories along the provincial borders. Beans come into Katanga Province from Zambia and Tanzania, mostly through Kasumbalesa and Kalemie border points, respectively.

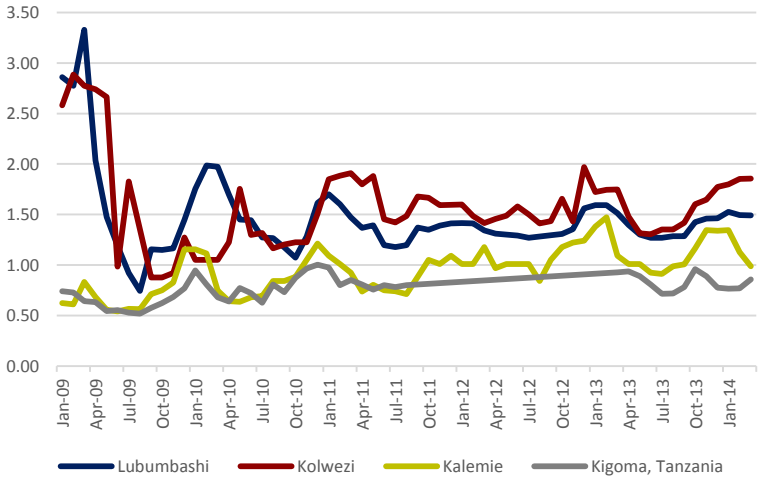
Seventy percent of total bean supplies in Katanga come from local production, with imports contributing the remaining 30 percent. The marketing chains are very basic, flowing from the source (farmer or importer) either directly to retailers or to wholesalers and then retailers. Humanitarian agencies purchase imported beans from wholesalers.

Figure 81 Bean marketing in Katanga Province



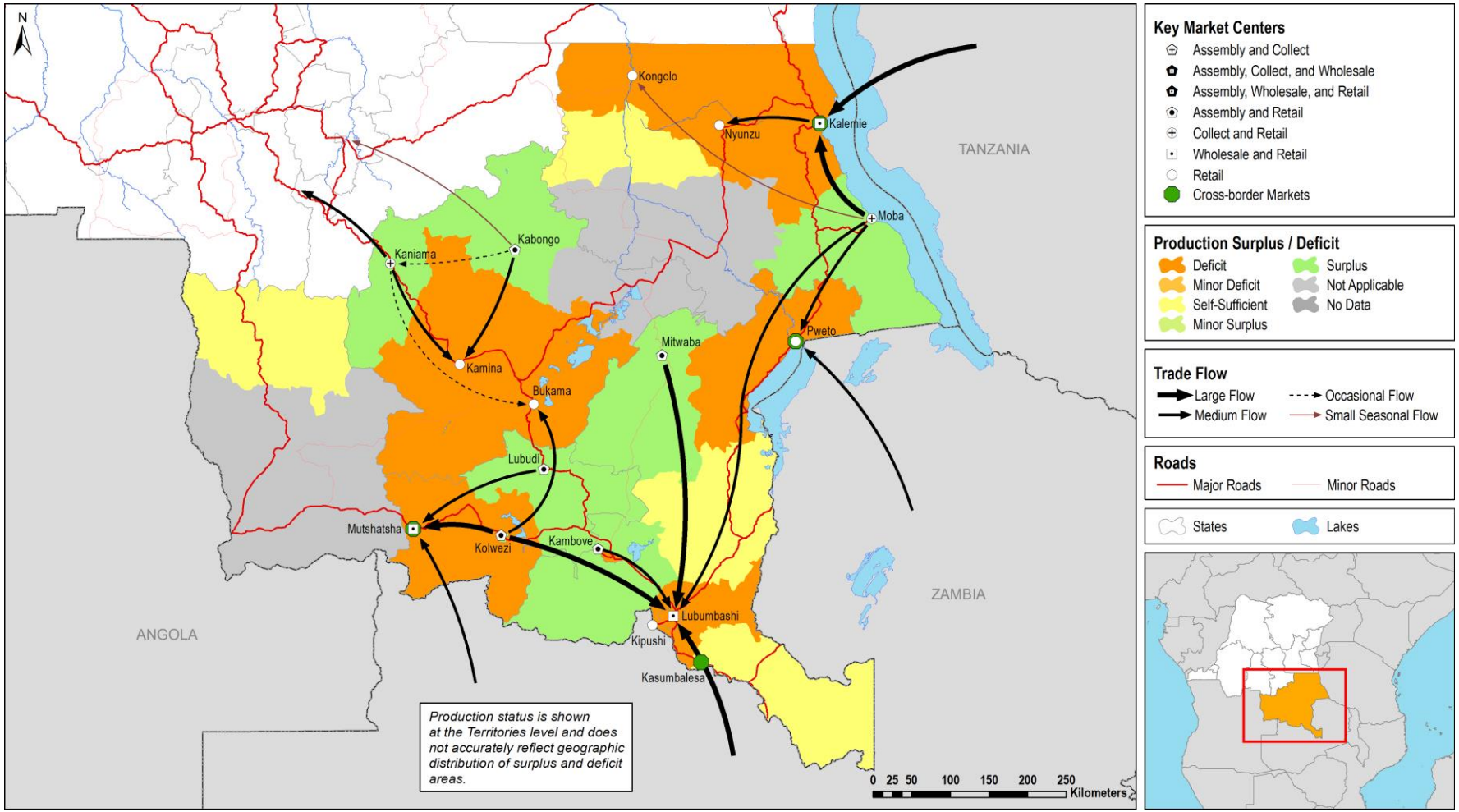
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

Figure 82 Dry bean prices (US$/kg) in Katanga Province and regional markets, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Tanzania Ministry of Industry, Trade and Marketing (2014).

Figure 83 Katanga Province dry bean production and trade flow map



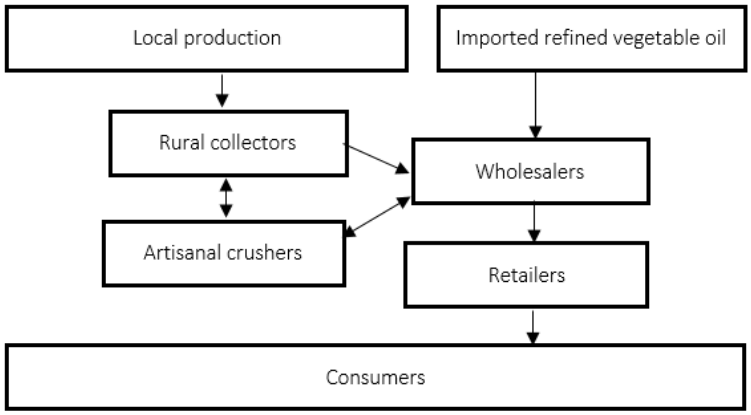
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

5.4 Edible oil markets in Katanga

The edible oils available in Katanga Province include locally produced palm oil and imported refined vegetable oil.

Katanga Province is structurally deficit in palm oil and relies heavily on international imports for up to 75 percent of the total supply. Within the province, Kabongo and Kabalo are the only two surplus-producing areas. Supplies flow from these two areas to the main consumption centers of the province and toward the Kasaï Provinces. The marketing chain for palm oil is very simple, going directly from the source (local production, or regional and international imports) to wholesalers and retailers.

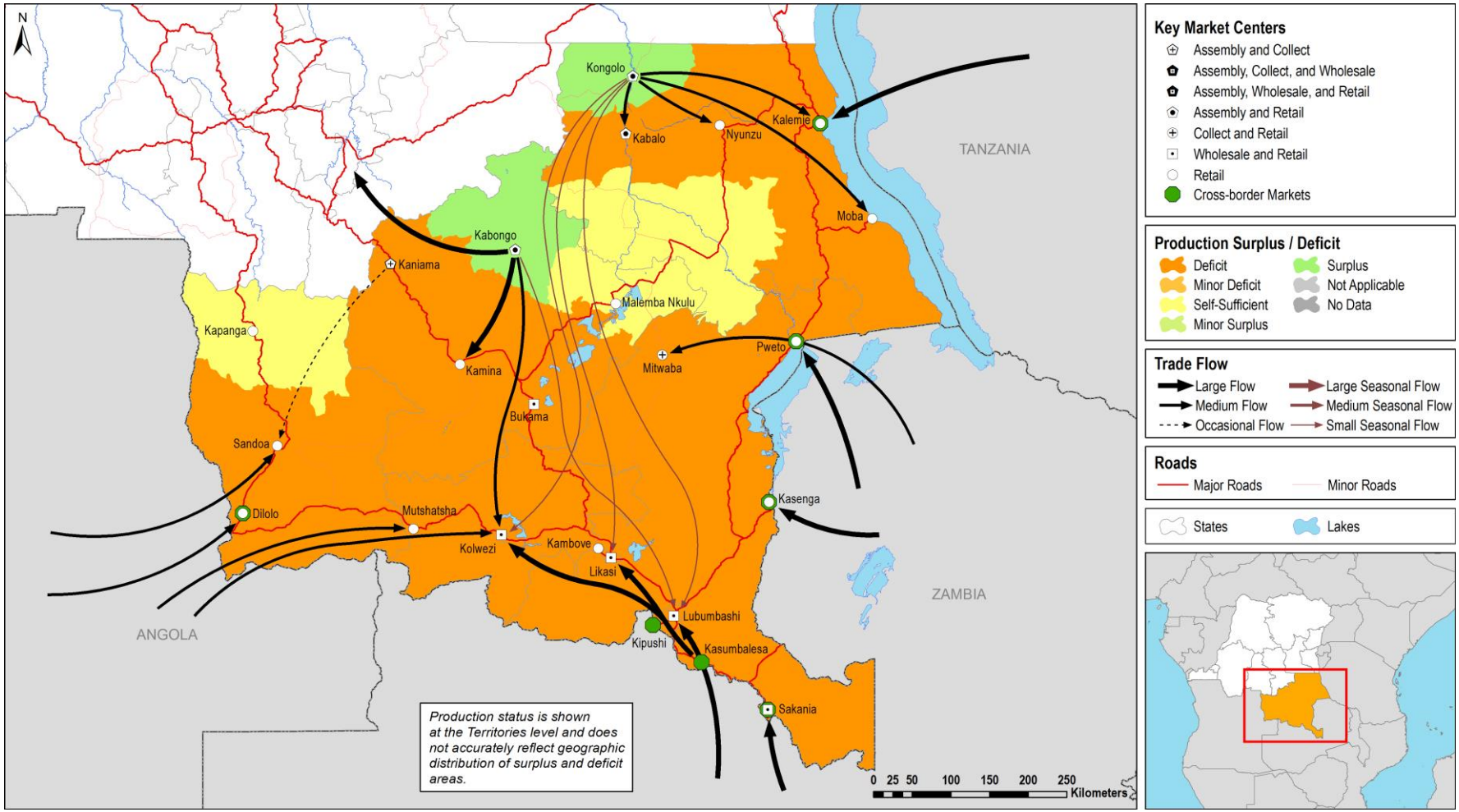
Figure 84 Edible oil marketing in Katanga Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

Although the province is highly dependent on imports to meet local needs, only a small number of vegetable oil importers exist (Brunelin 2011). These importers are mainly located in the province's main points of entry (greater Lubumbashi area and Kalemie), and, as elsewhere, they import other products as well.

Figure 85 Katanga Province edible oil production and trade flow map

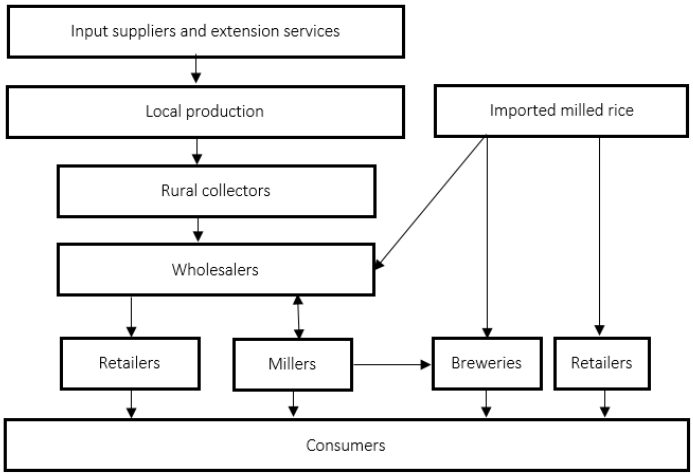


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

5.5 Rice markets in Katanga

Katanga Province is structurally deficit in rice and has minimal local production, contributing less than 5 percent of the total provincial rice supply. Only three small areas of the province are rice surplus producing: near Kasomeno (in the southeast corner bordering Zambia); the area between Kamina and Kolwezi (central); and Kabalo (north). Consumption is highest in the densely populated areas in the southernmost part of the province and almost no rice is consumed in the western territories (bordering Angola).

Figure 86 Rice marketing in Katanga Province



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

Trade flows reflect this consumption demand distribution, with the heaviest flows of rice in the province going to the main consumption centers of Lubumbashi, Kolwezi, and Likasi from the nearby surplus areas, as well as from neighboring Tanzania and, to a lesser extent, Zambia. Imported rice volumes from regional markets account for about 10 percent, while international imports account for the remaining 85 percent of total rice supply in Katanga Province. Reflecting these trends, domestic rice prices are above international rice prices, and are highest in Lubumbashi and Kolwezi, where demand is highest. Rice from Vietnam (30% broken) is the most consumed variety because it is the cheapest, followed by Pakistani rice (medium quality), and then rice from Thailand, which has the highest quality (10-20% broken) but is also the most expensive variety. Like cassava, the marketing chain for rice is relatively short. Local production and regional imports go almost exclusively to retailers, while international imports go to wholesalers. From wholesalers, rice is then distributed to breweries and retailers.

Figure 87 Local rice prices (US$/kg) in Katanga Province and regional markets, 2009-2014

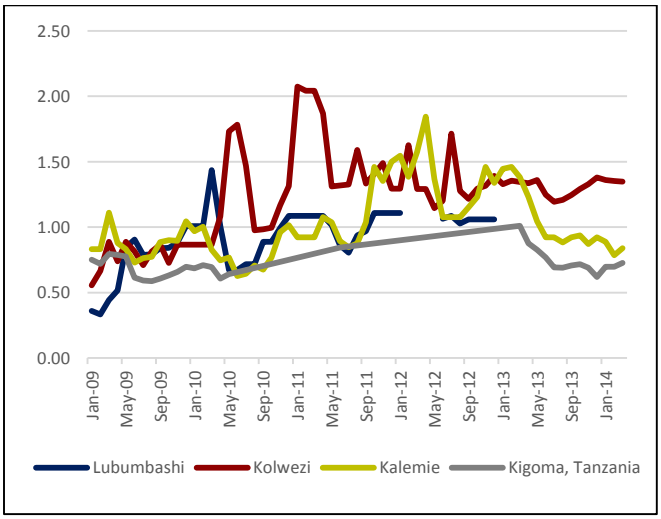
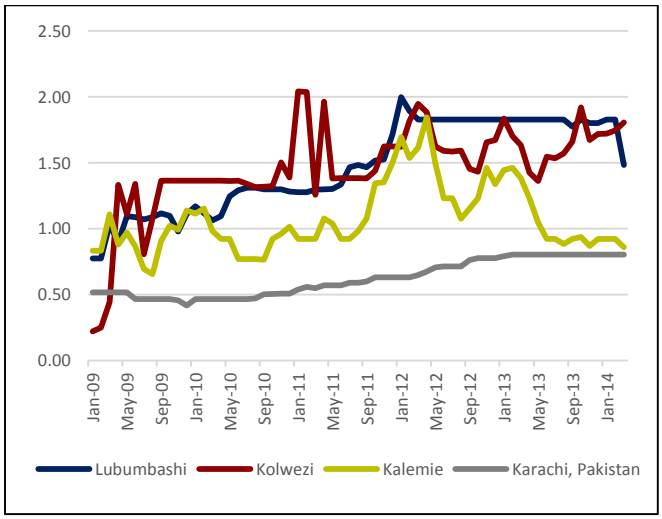
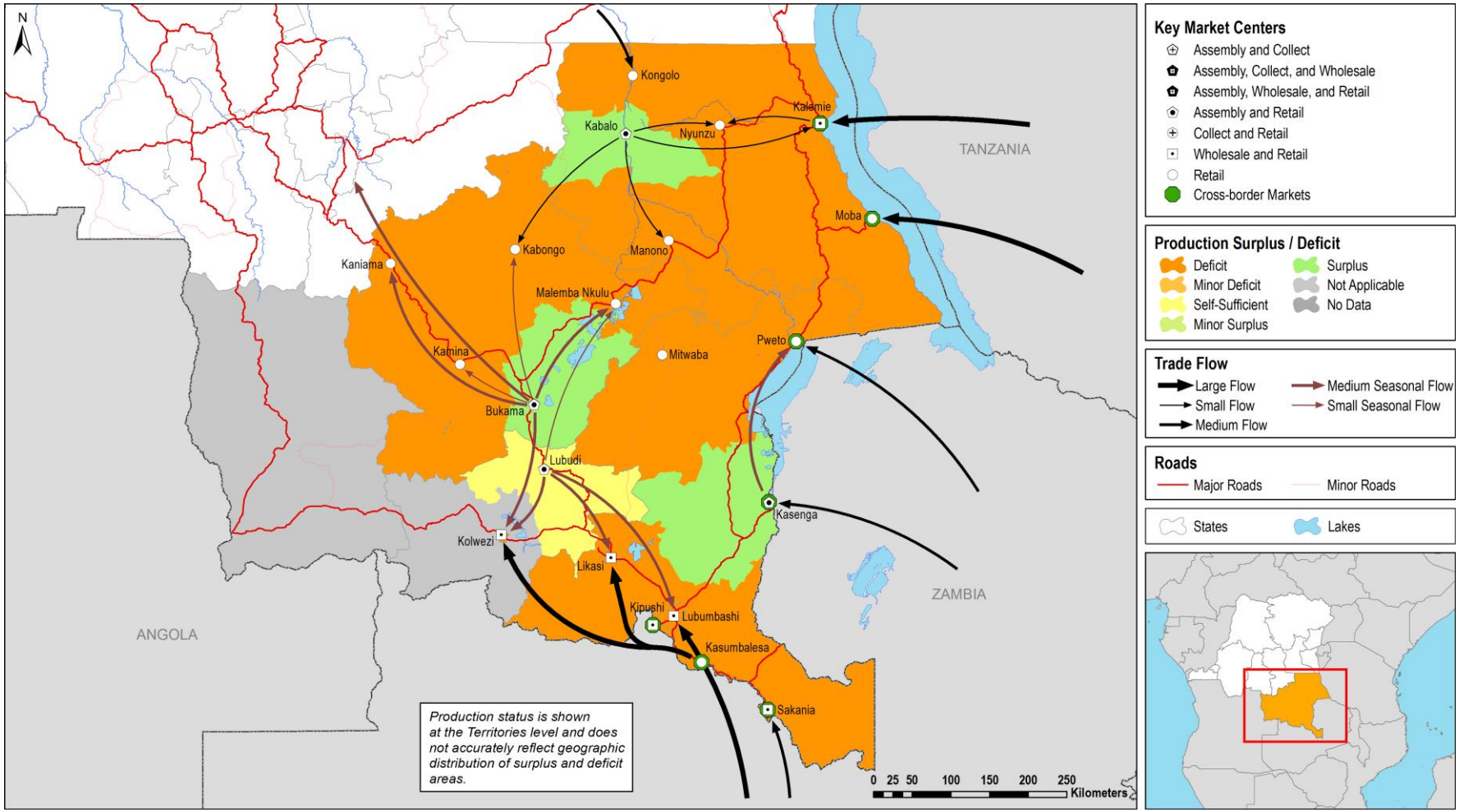


Figure 88 Imported rice prices (US$/kg) in Katanga Province and international markets, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Tanzania Ministry of Industry, Trade and Marketing (2014); Pakistan Bureau of Statistics (2014).

Figure 89 Katanga Province rice production and trade flow map

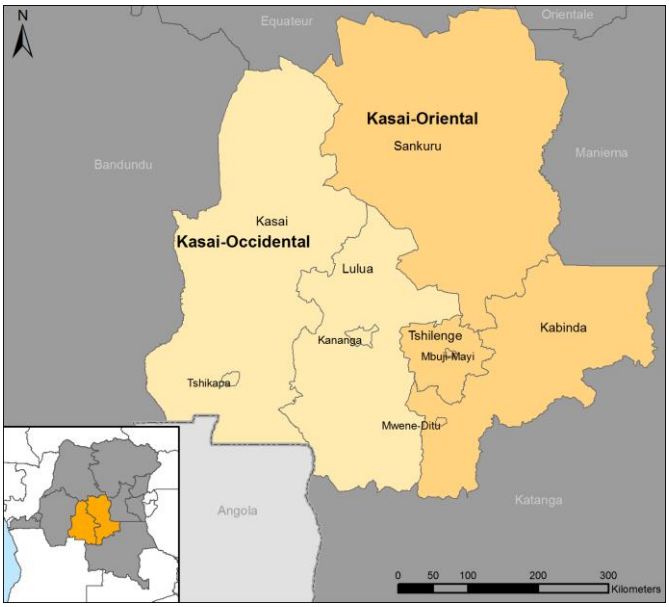


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Lubumbashi, Katanga Province (May 2015).

6. Kasaï Oriental and Kasaï Occidental Provinces

- The variety of staple foods produced and consumed in the Kasaï Provinces reflects the national trend, but with slightly more rice consumed by the population in the western part of Kasaï Oriental Province (Sankuru) and more maize consumed in Kasaï Occidental Province. Cassava is most commonly blended and pounded with maize meal to make fufu, creating a healthier dish than cassava or maize alone. Cassava, maize, legumes (including cowpeas, groundnuts, and other dried beans to a lesser extent), rice, and plantains are generally the staple foods in the Kasaïs. Irish and sweet potatoes are grown but play a less important role in daily dietary habits in the Kasaïs. Palm oil is an important crop in the Kasaïs as the only oil alternative is refined vegetable oil imported from international markets via Katanga Province.

Figure 90 Map of Kasaï Oriental and Kasaï Occidental Provinces



Source: Author's estimates based on FAO GAUL (2015).

- Approximately 5.4 million inhabitants live in Kasaï Occidental Province, and 6.6 million in Kasaï Oriental Province. The land mass in Kasaï Occidental Province is about 60,000 square miles, while Kasaï Oriental Province has about 67,000 square miles. Inhabitants in both provinces speak the same languages (including but not limited to Tshiluba) and share much of the same culture.
- Staple foods are produced by small-scale producers in both Kasaïs. Both provinces have a bimodal rainfall regime, with two distinct growing seasons, one from January to mid-May and a second from August to November (Annex 4). Minor differences exist in production and consumption trends in the two Kasaïs given the dense rain forest in the northern part of Kasaï Oriental Province in the Sankuru District, and in the Luiza District, where high savannah plains are found. It is also notable that the presence of CMD has significantly decreased the production and consumption of cassava in much of the Luiza District. In parts of each region, two growing seasons are possible, with some crops and harvests ongoing nearly year-round. These two provinces are nearly self-sufficient in terms of aggregate food availability (Table 17), although district-level differences exist.
- Agricultural production and marketing trends are quite similar between the two Kasaïs. Most staple food trade that does take place is intra-regional, with two main marketing basins: one surrounding Kananga and a second surrounding Mbuji-Mayi and south to include Mwene-Ditu. Trade by bicycle is extensive from Sankuru south to both provincial capital cities. Markets and trade flows for locally produced commodities circulate within and between the two provinces, western to eastern, and between the capital cities of Kananga and Mbuji-Mayi. Market linkages with neighboring provinces and countries are weak. Some rice produced in Sankuru is destined for Bandundu (and beyond) and is shipped by boat from Luebo. Up to one-third or one-half of maize supply in the Kasaïs may be sourced from Katanga Province (both maize grown in Katanga and imported from Zambia). However, it is important to note that the trade flows are not in the same volume or at the same intensity as trade flows between Zambia and Katanga due to friction in the marketing system created by the very poor state of infrastructure (including but not limited to roads). Occasionally some maize originating from Katanga Province (from local production or in transit from

Zambia) is sold to traders in Kinshasa after transiting through the Kasaïs. Likewise, some limited amounts of legumes (cowpeas) and maize are exported to Angola via Kasaï Occidental Province. Regardless of the lateral nature of the markets for locally produced and traded staple foods, all goods are generally competitive, with a large enough number of buyers and sellers of any given commodity during any given day. As discussed below, a number of factors negatively affect the performance of staple food markets.

Table 17 Sources of commodity supply (MT) in Kasaï Oriental and Kasaï Occidental Provinces [(a)]

		Cassava	Maize[(b)]	Dry beans	Palm Oil [(c)]	Milled rice [(d)(e)]
Kasaï Oriental	Local production	1,156,392	191,929	45,000	10,000	35,640
	Imports	0	60,000	0	unknown quantity	unknown quantity
	Other DRC supply	0	30,000	negligible	negligible	0
	Total Supply	1,156,392	281,929	45,000	over 10,000	over 35,640
Kasaï Occidental		Cassava	Maize[(b)]	Dry beans	Palm Oil [(c)]	Milled rice [(d)(e)]
	Local production	958,229	169,329	15,000	20,000	9,040
	Imports	0	50,000	0	unknown quantity	unknown quantity
	Other DRC supply	0	30,000	negligible	negligible	5,000
	Total Supply	958,229	249,329	15,000	over 20,000	over 14,040

Note:
(a) For all commodities, there are trade linkages between the two Kasai provinces, especially in the border areas. However, with the exception of milled rice, quantifying the volumes is very difficult and not attempted here.
(b) Other DRC supply is from Katanga and imports are from Zambia (and transit through Katanga Province) in the form of both maize grain and maize meal/flour. Up to one- third or one-half of maize supply in both Kasai provinces is likely sourced externally.
(c) All palm oil produced in the Kasai provinces is processed artisanally (AGRER 2006). There are also imports of refined palm oil sourced from international markets (transiting via Katanga Province). However, those volumes are limited and are not estimated here.
(d) Milled rice assumes a milling rate of 65%.
(e) Other DRC supply of milled rice in Kasaï Occidental Province is sourced from the northern districts of Kasaï Occidental Province (Sankuru area in particular). There are also some imports of internationally sourced milled rice via Katanga Province, but those volumes are not estimated here.

Source: Authors' calculation based on SNSA (2012), AGRER (2006); FEWS NET workshop proceedings Mbuji-Mayi, Kasaï Oriental Province (May 2015).

Table 18 Average agricultural production (kg) per capita in Kasaï Oriental and Kasaï Occidental Provinces, 2006-2011 [(a)]

Province/District	Maize	Rice[(b)]	Cassava	Banana	Dry Beans	Edible Oil [(c)]
Kasaï Occidental	31.82	2.62	187.58	1.93	0.00	0.0005
Kasai	N/A	N/A	N/A	N/A	N/A	N/A
Lulua	31.82	2.62	187.58	1.93	0.00	N/A
Kasaï Oriental	36.61	7.24	218.64	2.71	0.13	0.0005
Sankuru	23.31	21.77	262.40	4.49	0.06	N/A
Tshilenge	41.47	0.00	169.86	0.90	0.15	N/A
Kabia	77.22	2.01	384.53	4.20	0.29	N/A

Note:
(a) Province-level per capita averages were calculated based on the entire provincial population; district-level per capita averages were calculated after excluding urban populations in the district as many urban centers comprise distinct districts with near-zero production.
(b) Paddy rice.
(c) Production data only available at the province level.

Source: Authors' calculations based on SNSA (2012), Akakpo, Randriamamonjy, and Ulimwengu (2014), and FEWS NET (2015a).

- The main agricultural technology used in the two Kasaï Provinces involves forest clearing and burning followed by cropping for two to three years before leaving a current field due to decreasing soil fertility. Complete regeneration of cultivated land requires 7-8 years to reestablish soil fertility. Forest cover requires 15-20 years. Uncontrolled burning of the interforest savanna prevents the accumulation of organic matter in those soils and limits their agricultural value (van Wambeke 1974). This system of cultivation, known by various names (including slash-and-burn or shifting cultivation), means that at any given time, one

household may have under its purview up to ten or more fields, most of which are fallow. This system is based on extensification rather than intensification: in other words, acquiring more land to cultivate rather than increasing yield on fields already cultivated. Cropping and wood harvesting pressures have caused considerable loss of original forest, and in some cases have reduced fallow periods between cropping cycles to as little as three years. Reduced fallow periods result in lower yields (per land area) and encourage farmers to increase crop production area to maintain total crop production. This is a key contributor to the decline in crop production in the Kasaï Provinces.

Table 19 Ranking of commodities consumed, in order of importance, by district in Kasaï Oriental and Kasaï Occidental Provinces

Product/District	Kasaï	Lulua	Kabinda	Sankuru	Tshilenge
Cassava	2	2	1	2	1
Maize grain/flour	1	1	2	3	2
Dry beans	3	3	4	4	4
Rice-local	5	5	N/A	1	N/A
Rice-imported	N/A	N/A	N/A	N/A	N/A
Groundnuts	4	4	3	5	3
Legend Rank 1= Most important, 6 = least important, N/A = not consumed or limited consumption.					

Source: Authors' estimates based on FEWS NET workshop proceedings Mbuji-Mayi, Kasaï Oriental Province (May 2015).

- Increasing population pressures in the traditional agriculture sector (as in other food crop-producing areas of the country) and the generally sandy soils of this region of the country in particular have resulted in similar practices of shorter fallow periods between cropping cycles and the cultivation of ever-increasing areas. The gallery forests are being cut to supply the demand for fuelwood and more fertile agricultural soils. This is particularly true in the savannah areas in the southern parts of the Kasaï Provinces.
- Yields per land area are declining, requiring more land (generally more marginal) to be brought into production. Crops tolerant of a poorer nutrient base are increasingly grown in spite of their poorer quality for human nutrition, particularly cassava. Cultivation of degraded soils results in higher plant densities (as farmers attempt to sustain and increase production), less soil cover, and greater soil erosion.
- Household labor is the primary input to production, and given the current system/technologies in practice, labor is the principal constraint to increased agricultural production and another key factor to the decline in crop production in the Kasaïs. The physical availability of land and soil fertility are not major constraints to increasing agricultural production in the Kasaïs. However, labor productivity is generally low and few incentives exist to intensify production. For example, the same fertilizer that costs US$25-$30 in Katanga Province costs US$100 in either Kasaï Province. Improved varieties of seed are available at the research station in Ngandajika but are not accessible to the majority of farmers in the Kasaïs.
- The physical isolation of the two Kasaï Provinces with respect to the rest of the country is reflected in the deterioration in or lack of infrastructure throughout, including within the provincial capitals of Kananga and Mbuji-Mayi. The two Kasaïs are landlocked provinces within a country that is nearly landlocked. Nowhere in either Kasaï is there municipal 24-hour electricity. Both capital cities generate less than ten hours of electricity per day and frequently less than six hours. Running water requires electricity in most instances and is thus limited. The deeply eroded or nonexistent infrastructure has both direct and indirect effects on agricultural production and marketing (including transportation, processing, and storage, among others).
- At present, the only paved road within the two provinces outside of the capital cities of Kananga and Mbuji-Mayi originates in Mbuji-Mayi and ends in Mwene Ditu. This road was paved in 1976 with some more recent maintenance. No graded or sanded/graveled roads exist in either Kasaï. While several donor projects are working on road maintenance in the Kasaïs, there is little evidence of any major progress and many plans for

road improvements are stalled or never started. Few large trucks (half-container equivalents) use the roads and those that do transport higher-valued fuel and consumer goods including processed foods consumed by higher-income populations, not bulk agricultural commodities that make up the majority of the consumption basket for poor and very poor households. Small trucks are an even less common sight. The most common mode of transport for agricultural goods is the bicycle. These "*bicycle commerçants*" carry loads of maize and rice up to 200-250 kg on the muddy, sandy, torn-up roads of the Kasaïs. A recent study by l'Université de Lubumbashi (UNILU 2011) suggests that "*bicycle commerçants*" have very limited opportunities to earn a profit from their work, creating strong disincentive effects. However, in their absence, the limited trade linkages that do exist would likely grind to a halt.

- A project initiated by the African Development Bank in late 2014 has begun a portion of the road south of Kananga that will continue down to the border with Angola and continue through Kananga to Mbuji-Mayi to Katanga Province. Until or unless a paved, quality road is built in and through the Kasaïs, incentives will remain low for increasing agricultural output, as market signals from consumption centers are not easily transmitted to surplus areas and vice versa. The cost of inputs will remain high until consistent and reliable fuel and other goods become less costly.
- While the state-owned train (*Société Nationale des Chemins de Fer du Congo/*SNCC) is said to run through both Kasaï Provinces, it runs erratically, if at all.[32] To date, the Chinese investment in the SNCC has not extended to the portions of the line running through the Kasaïs, leaving only limited air traffic and dangerous overland transport services for transport.
- Aside from road and train, the DRC's extensive waterways present some opportunities for transporting goods into the Kasaï Provinces.
    - The port of Ilebo is regularly used to bring goods up the river from Kinshasa, which are then sold in the town of Luebo (over 20 km away). Barges are not able to come directly to Luebo due to sand drifts on the riverbed. Therefore, goods are offloaded onto smaller boats at the port and transported to the final destination. Facilities in Luebo include limited storage owned by the government, a newly built private facility, and storage facilities owned by the Catholic dioceses. Caritas, in conjunction with WFP, has brought in-kind assistance into Kasaï Occidental Province in the past five years, although in limited quantity. Transportation from Kinshasa to the port of Ilebo is viable, but large-scale, overland transport and distribution of commodities beyond Luebo would be very difficult.
    - The port at Bene Debele is another option that presents fewer obstacles. This port is located approximately 100 km south of Lodja. State-owned storage facilities are there, and a ferry crosses the river with some regularity. The road to Lodja is nominally passable by mid-sized trucks, small trucks, four-wheel drive vehicles, and bicycles. The trip from the port by truck is two to three hours.
- Storage facilities outside of the ports described above are scarce in the Kasaï Provinces, though one of the integrated infrastructure projects of CTB (Coopération Technique Belge) has built a number of sizeable market structures that include storage facilities. CTB has also built modest-sized commodity warehouses in numerous villages. At the river ports of Bene Debele and Luebo, ONATRA (*Office National des Transports*) storage is available, along with facilities owned by the Catholic dioceses in Luebo and a commercial operator (Annex 6).
- The influence of diamond mining in each Kasaï Province differs currently. Small-scale, informal alluvial diamond digging (also known as artisanal diamond mining) is usually undertaken by individuals, families, or groups using very basic equipment, such as sieves and pans, to search for diamonds. The majority of small-

[32] No train ran in the Kasaï Provinces during the assessment period.

scale alluvial diamond digging is defined as "informal" because it is often undertaken on land that is neither licensed nor regulated for the mining activities taking place, or the diamonds are not sold through licensed dealers, the most common issue in the Kasaïs. In 1982, the government of the DRC (then Zaire) began allowing individuals to mine for diamonds, an activity previously restricted to contracted and licensed companies. The two principle diamond mines in the DRC are in the Kasaïs. La Société Minière de Bakwanga (MIBA) is located in Mbuji-Mayi adjacent to the city, with industrial-quality diamonds mined at that location. At one time over US$2.5 million per month was paid out to workers, contractors, and other businesses linked to the mine.[33] Over the last ten years, that has trickled down to approximately US$100,000 per month. Alluvial mining is still active, with numerous diamond buyers vying for the purchase of each diamond found. One section of the city is beleaguered with diamond-buying enterprises, with storefront after storefront offering to buy diamonds at the best price. In an interview with the CEO of MIBA, FEWS NET staff were told that no scale-up of the mine is planned in the next several years, but the company is open to partnering in diamond or other types of mining. Tshikapa, south of Kananga, is the second location of diamond mining in the Kasaïs. This active mine contributes approximately 12 percent to Kasaï Occidental Province's economy. The mining area of Tshikapa is deficit in nearly all basic staple foods, with the highest prices of food in both Kasaïs. At one time, both regions had above-average purchasing power of the population because of diamond mining. As a result of the still active mining around Tshikapa, Kasaï Occidental Province retains some of this purchasing power and is the wealthier of the two Kasaïs.

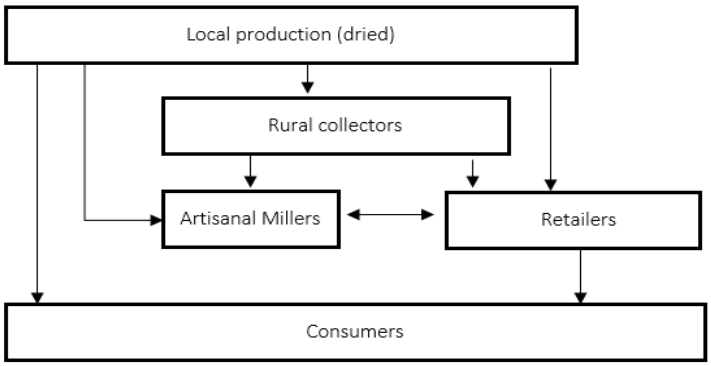
- The Kasaïs have always been modestly food deficit, importing maize, cassava, and groundnuts from neighboring Bandundu and Katanga Province in the past. Farmers in the region have a reputation for being dynamic and enterprising, however (USAID Zaire 1990). In the 1970s, there were two large area development projects in the Kasaï Provinces, both of which had maize as their major focus. The PMKO project (*Projet Mais Kasaï-Oriental*) around Tshilenge in Kasaï Oriental Province was funded by the World Bank through 1987. Another World Bank-supported project, PRODALU (*Projet de Developpement Rural de Lulua*, or Lulua Rural Development Project), in Kasaï Occidental Province focused on maize production through 1990.
- Markets in the Kasaï Provinces are much thinner than elsewhere in the country. Although some markets play the role of wholesale markets, they are few and limited to those linked with major markets in neighboring provinces or countries (for example, Mwene Ditu, which receives supplies of maize from Katanga Province and neighboring Zambia). Marketing of agricultural commodities takes place between Kananga and Mbuji-Mayi, but it not possible to say those markets are particularly well integrated. Rather, between those two consumption centers, as in the rest of the Kasaïs, market linkages exist but no true marketing corridor. This is due in large part to the heavily deteriorated state of local infrastructure and the resulting dependence on small-scale traders (discussed above), which together make it very difficult for commodities to circulate easily within the provinces.
- Industrial milling is not done in the Kasaï Provinces, attributable to a combination of factors. The poor road network system creates friction in the marketing system, making it difficult for industrial millers to efficiently use large-scale processing technology that one might find in Katanga (for example) due to limited and unpredictable throughput. The very limited availability of electricity and strong dependence on diesel generators are likewise major constraints. Milling therefore takes place via small-scale village mills that are owned and operated by individuals (not cooperatives). Otherwise, all industrially milled maize is sourced via Katanga Province (both local and imported maize meal from Zambia).

[33] Personal communication with Mr. Dieudonne Kasanda, Administrative Director of MIBA, Mbuji Mayi, May 21, 2015.

6.1 Cassava markets in Kasaï Oriental and Kasaï Occidental

Cassava is the most important staple food produced and consumed in Kasaï Oriental and Kasaï Occidental Provinces (Table 17; Annex 5). As is the case elsewhere in the country, cassava can be harvested throughout the year. It is transformed or eaten raw, roasted, or made into tapioca or *tshikuanga* (a preparation that includes bananas and peanuts and is portable since it is made into bars and packaged in banana leaves). Cassava is used to make local liquor, and its leaves, high in protein and some micronutrients, are used regularly as the base for a sauce.

Figure 91 Cassava marketing in Kasaï Oriental and Kasaï Occidental Provinces



Source: Authors' estimates based on FEWS NET workshop proceedings Mbuji-Mayi, Kasaï Oriental Province (May 2015).

Both provinces are generally self-sufficient in cassava (Table 17). Localized deficit areas exist between the urban centers of Kananga and Mbuji-Mayi, Lubefu District (west of Mbuji-Mayi), and Tshikapa District (east of Kananga). The main surplus-producing territories include the Luiza District in Kasaï Occidental Province, Mwene Ditu and Ngandajika in Kasaï Oriental Province, and Demba, west of Kananga. CBSD and CMD continue to have a negative impact on production in some of the more productive areas of the provinces, most notably the surplus-producing Luiza District, with implications for local food availability.

Trade flows for cassava are largely oriented toward the consumption centers of Kananga and Mbuji-Mayi, with the former serving as a transit point for trade between the two provinces. Distribution channels are short throughout the Kasaïs, with much of the production remaining close to production points, including local retail markets. The three deficit areas in the Kasaïs are: the area surrounding Lubefu (Kasaï Oriental Province, to the east); the area between Mbuji-Mayii and Kananga; and the territory of Tshikapa.

Dried cassava is milled by artisanal millers in the Kasaï Provinces (Figure 91). Using diesel engines or electricity from the grid (where available), small- or modest-sized mills mill dried cassava, which is self-limiting given the dearth of accessible electricity in the Kasaïs. Cassava trade is dominated by women.

Figure 92 Dried cassava prices (US$/kg) in the Kasaï Provinces and elsewhere in the DRC, 2009-2014

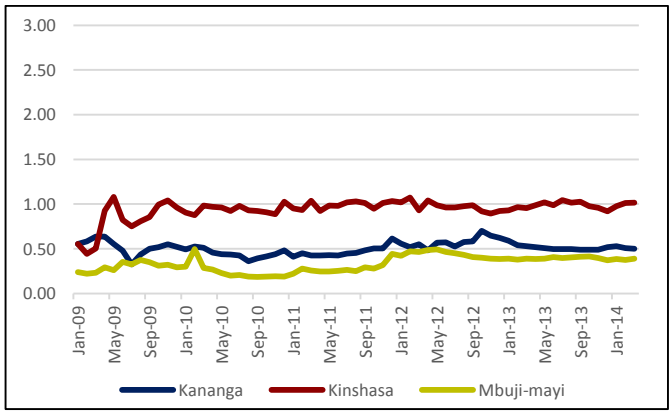
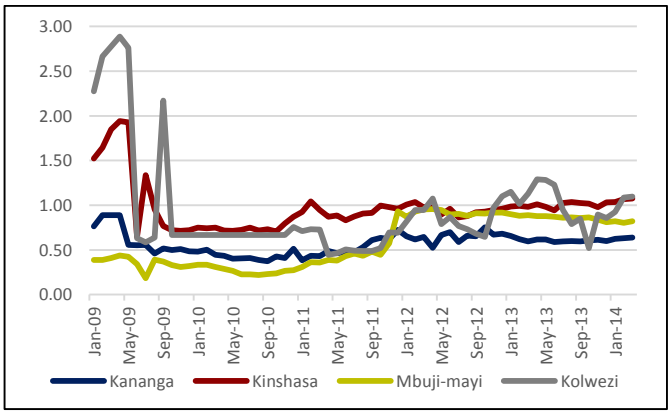
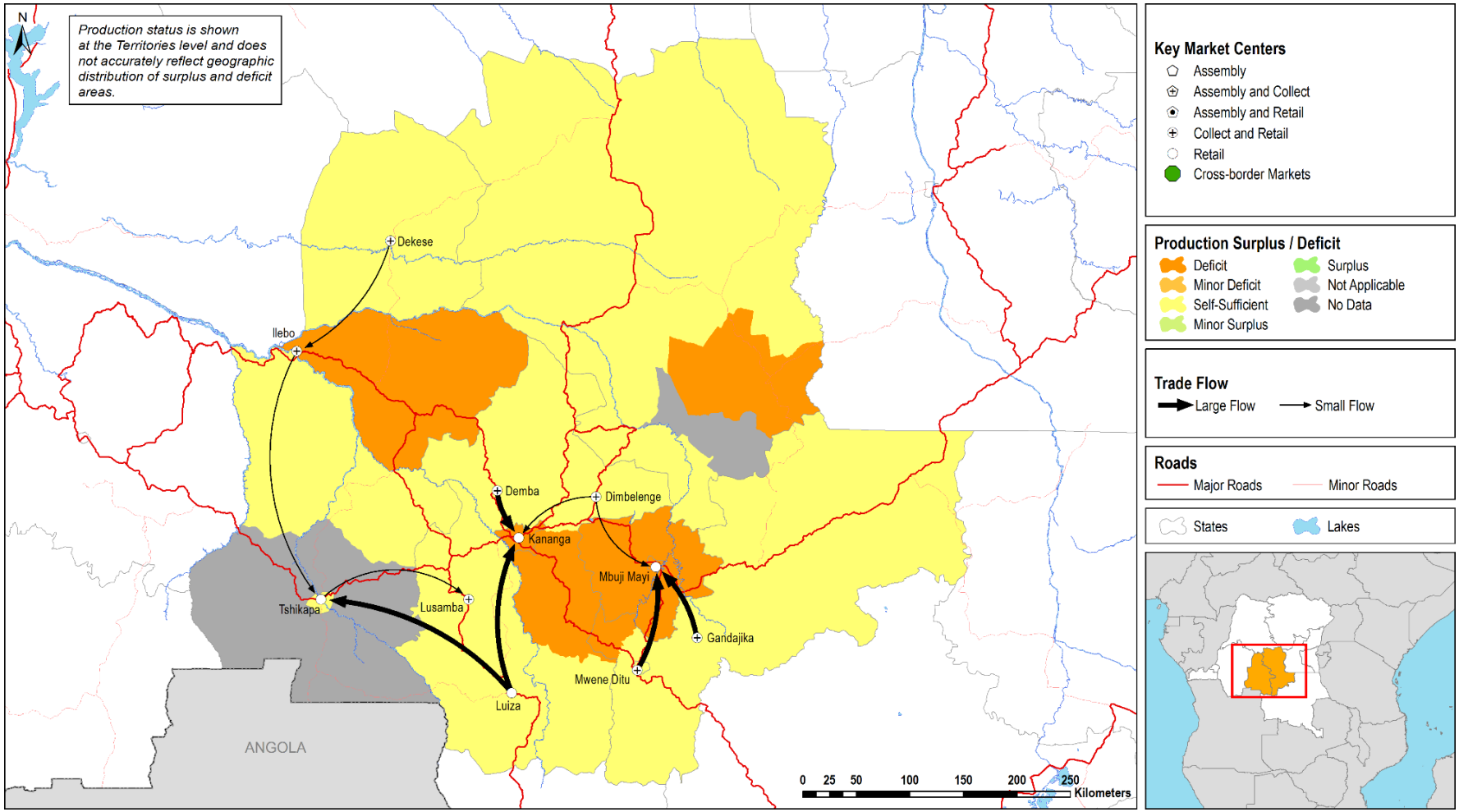


Figure 93 Cassava flour prices (US$/kg) in the Kasaï Provinces and elsewhere in the DRC, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014) and Oanda (2015).

Figure 94 Kasaï Oriental and Kasaï Occidental Provinces cassava production and trade flow map

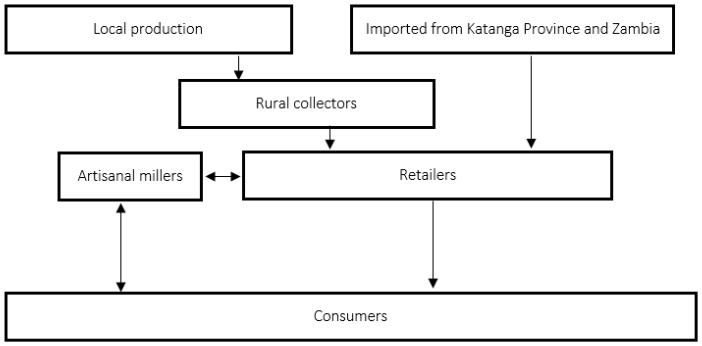


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

6.2 Maize markets in Kasaï Oriental and Kasaï Occidental

Maize is an important staple food in the Kasaï Provinces. Each Kasaï Province relies on supplies from Katanga and Zambia to meet local needs. Some of those imports and some excess local production is sent to Kinshasa (via boat). Within each province there are specific areas with notable deficits in maize. Tshikapa is a maize deficit area due to active diamond mining in the area and is supplied by Luiza and Lulua, south of Kananga. In Kasaï Occidental Province, Dibeya, with its soil not conducive to growing maize, leaves Mbuji-Mayi deficit, resulting in the district being supplied by Luiza (southern Kasaï Oriental Province) and Mwene Ditu, south in Kasaï Occidental Province.

Figure 95 Maize marketing in the Kasaï Provinces

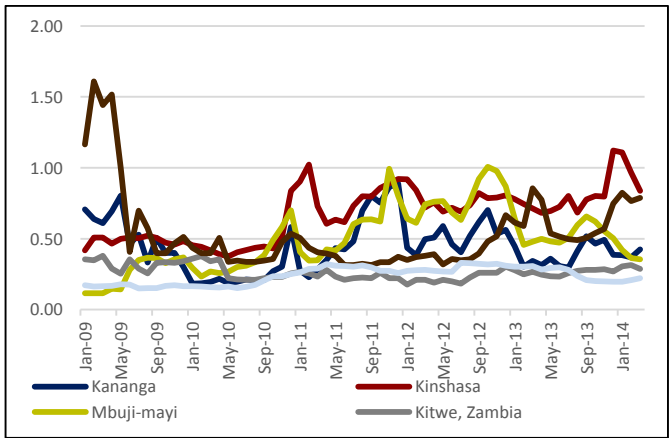


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

A moderate amount of maize enters the DRC destined for Kinshasa from Zambia and transits through Katanga Province (via Lubumbashi) and then via the Kasaïs. Increasing amounts of maize are exported to Angola. Mwene Ditu has large collection points and functions at times as a collection/wholesale market given the quantities arriving from Zambia. For this reason, the market for maize in Mwene Ditu is the closest to a wholesale (or very large rural assembly) market that exists in ether province. Three types of maize production systems exist in the Kasaïs: savannah (found mostly in the south of both provinces); forest (found mostly in Sankuru region, north in Kasaï Oriental Province); and intercropped in other traditional fields. Some maize is transported by truck, though most of it is transported through the Kasaïs via bicycle in loads of 200-250 kg. Much of the external trade flows take place on a seasonal basis, but are heavily influenced by the abject lack of infrastructure and industry.

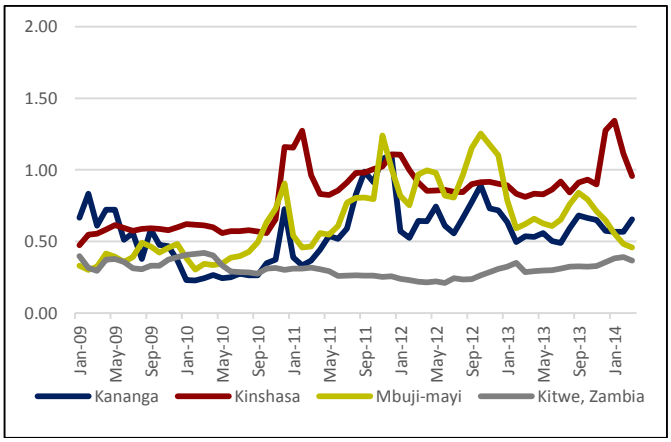
Maize is mixed with cassava flour to prepare fufu, eaten daily in the Kasaïs. At one time, fufu was nearly all cassava, but over the last 30 years, the standard mixture has changed, with greater than 50 percent of the mix now maize. At harvest time, maize is roasted and eaten fresh. No large-scale maize millers operate in the Kasaïs, as exorbitant transportation costs and the lack of electricity dampen private sector investment.

Figure 96 Maize prices (US$/kg) in the Kasaï Provinces and regional and international markets, 2009-2014



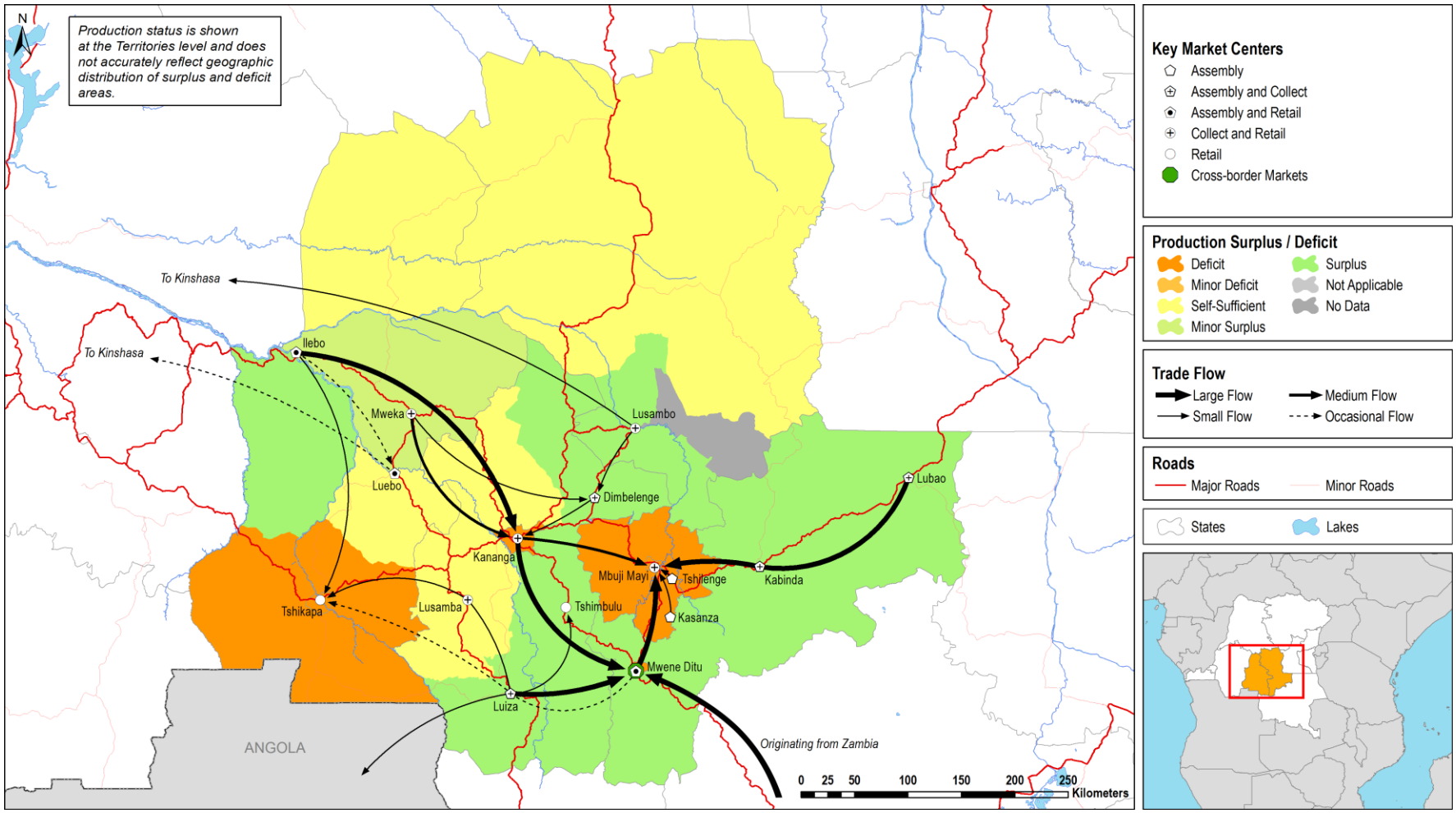
Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Zambia Central Statistics Office (2015); USDA (2015).

Figure 97 Maize meal prices (US$/kg) in the Kasaï Provinces and regional markets, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Zambia Central Statistics Office (2015).

Figure 98 Kasaï Oriental and Kasaï Occidental Provinces maize production and trade flow map



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

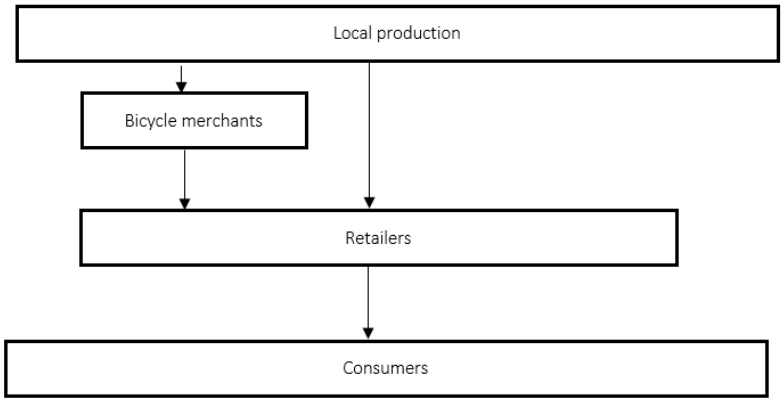
6.3 Dry bean (cowpea) markets in Kasaï Oriental and Kasaï Occidental

Cowpeas, or *niébé* as they are known in the DRC, are produced in quantities allowing for self-sufficiency and some slight localized surpluses in the Kasaï Provinces (Figure 101). Some other legumes are produced (groundnuts as well as local dry bean varieties), but cowpeas dominate.

Marketing channels are short and most of the production is sold at local retail markets. Farmers sell directly to retailers or to collection points where bicycle merchants bring them to Mbuji-Mayi to local markets. Some flows from the surplus-producing Luiza District and Kananga cross the Angolan border to the south of Luiza, with additional flows into Tshikapa, a structurally deficit mining area.

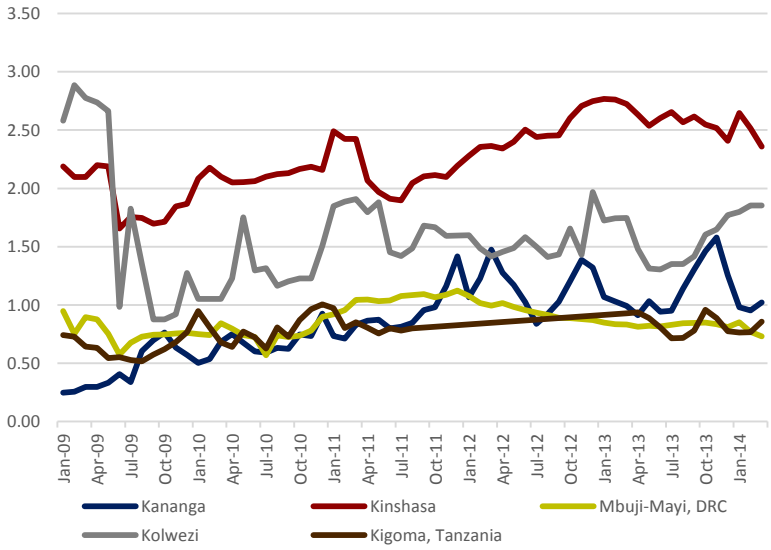
Prices in the Kasaï Provinces are typically lower than elsewhere in the country, further reinforcing the notion that these two provinces do not rely heavily on external sources to meet local needs (no strong incentives to trade).

Figure 99 Dry bean (cowpea) marketing in the Kasaï Provinces



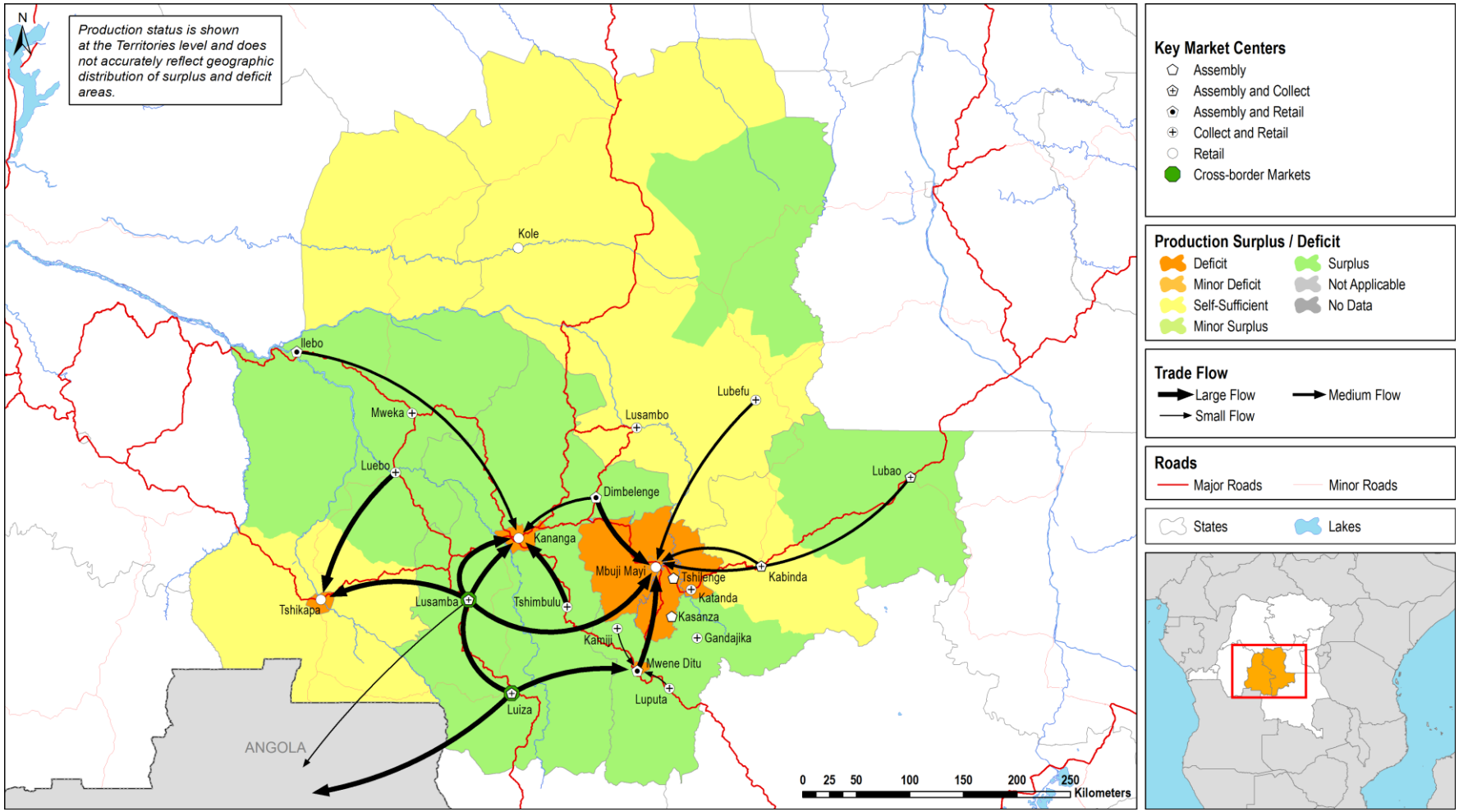
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

Figure 100 Dry bean prices (US$/kg) in the Kasaï Provinces and regional markets, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015); Tanzania Ministry of Industry, Trade and Marketing (2014).

Figure 101 Kasaï Provinces dry bean (cowpea) production and trade flow map



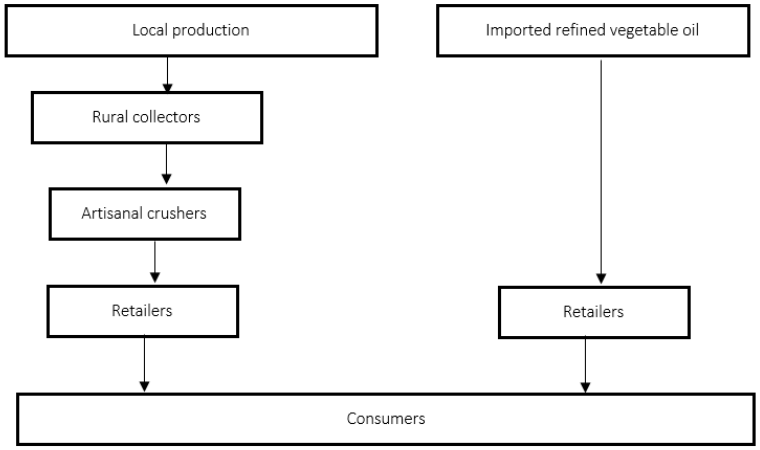
Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

6.4 Edible oil markets in Kasaï Oriental and Kasaï Occidental

Palm oil production in the Kasaïs is nominally insufficient. More oil is produced in Kasaï Occidental Province than in Kasaï Oriental and generally speaking, more is produced in the northern part of each province.

Trade flows are limited and marketing channels are short, though oil flows from Dekese to Mwueka and Makasu and down to Kananga. From Kananga, palm oil flows to Tshikapa. Lusambo, Kabinda, and Lubao all supply oil to Mbuji-Mayi, as does Mwene Ditu and other areas south of the capital. All crushing (transformation) is artisanal as the last industrial producer closed down several years ago.

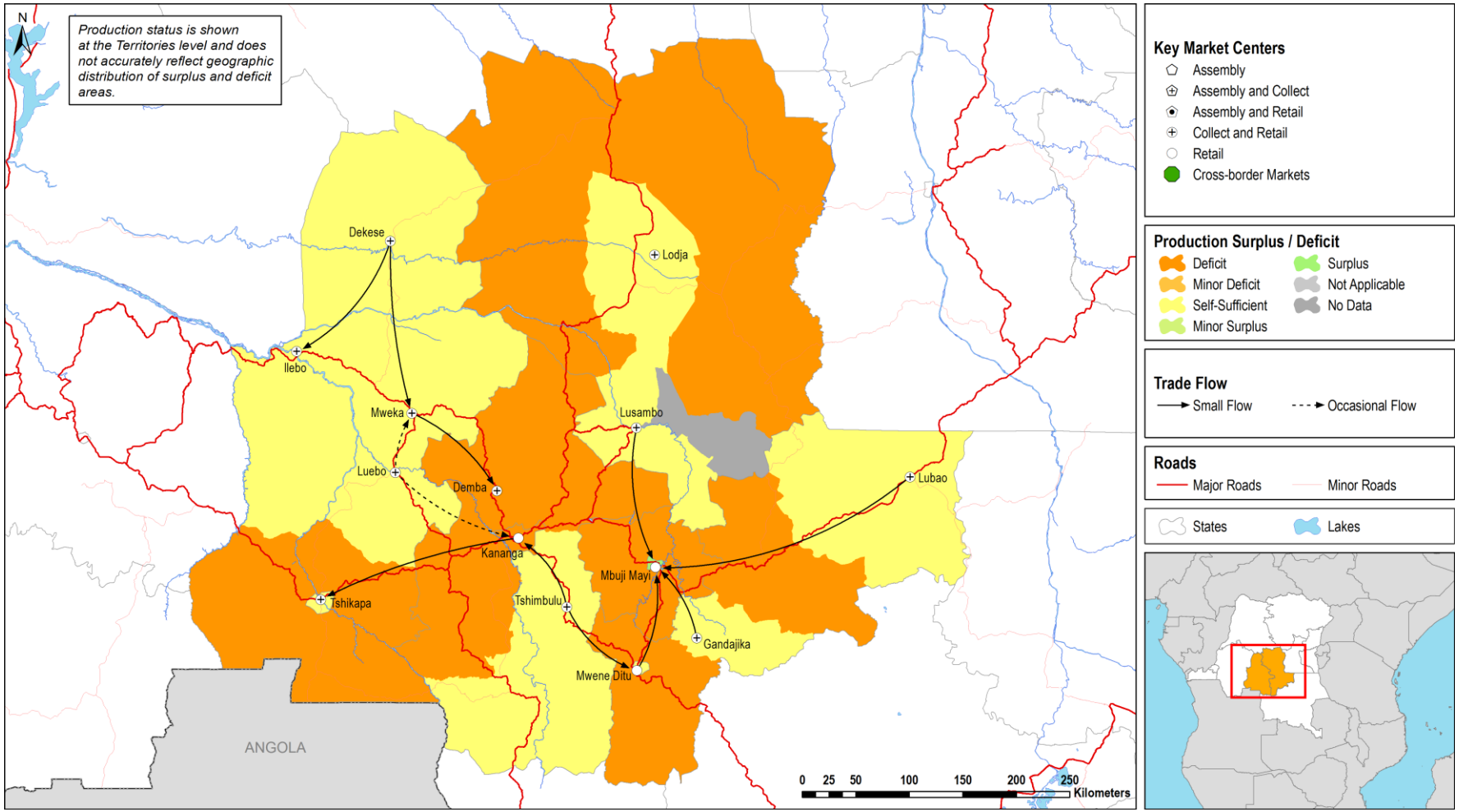
Figure 102 Edible oil marketing in the Kasaï Provinces



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

The only real substitute for local palm oil is relatively more expensive refined vegetable oil imported via Katanga Province. Although it is generally accepted that imported refined vegetable oil supplies are non-negligible, it is not possible to provide quantitative estimates of their volumes or relative importance. As with other commodities, trade linkages with other provinces are weak, involving small-scale traders and trader networks.

Figure 103 Kasaï Provinces edible oil (palm oil) production and trade flow map

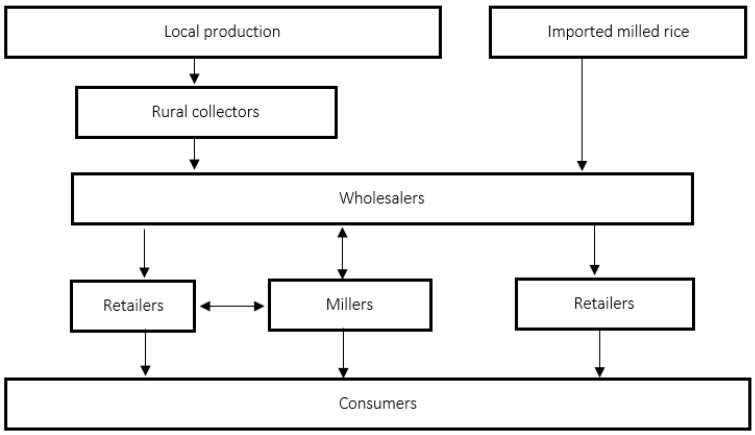


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

6.5 Rice markets in Kasaï Oriental and Kasaï Occidental

Rice has long been a secondary or alternate staple in the Kasaï Provinces. That said, much of the region is rice deficit, with the exception of Sankuru District (Kasaï Oriental Province) and Dikese District (Kasaï Occidental Province). Lomela, in the northern part of Kasaï Oriental Province, is nominally deficit at times. Imported rice is available, but locally produced rice is generally preferred and many people are not able to afford imported rice, as local rice sells at a much lower prices than imported rice (Figure 105 and Figure 106).

Figure 104 Rice marketing in the Kasaï Provinces

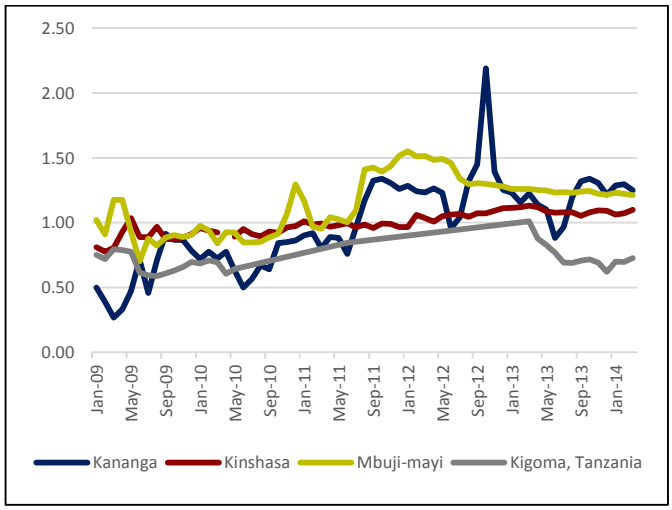


Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

The central government of the DRC (and previously Zaire) developed many programs to expand the quality and quantity of rice production in the northern districts of the Kasaïs. Currently, neither government support nor any interventions of any type for rice production are received in Sankuru or elsewhere in either Kasaï Province.

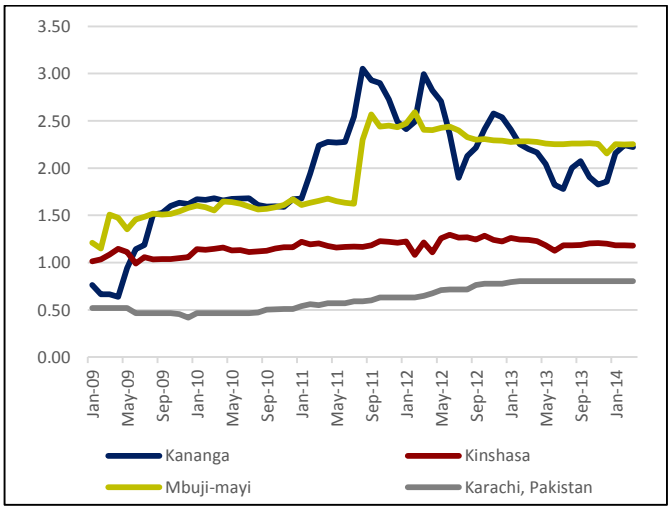
Trade flows are limited. In Sankuru, Lodja is the center of local rice collection and distribution but lacks a wholesale market. Bicycles bring rice to Mbuji-Mayi, Ilebo (headed to Kinshasa), and Kananga. From Mbuji-Mayi, some rice is sold to destinations in Maniema and Katanga Province through Lubao/Kamena. Some rice is sold to markets in Kananga, originating in Sankuru. Nearly all of the rice originating from Dekese in the northern part of Kasaï Occidental Province goes down river from Ilebo to Kinshasa.

Figure 105 Local rice prices (US$/kg) in the Kasaï Provinces and regional and international markets, 2009-2014



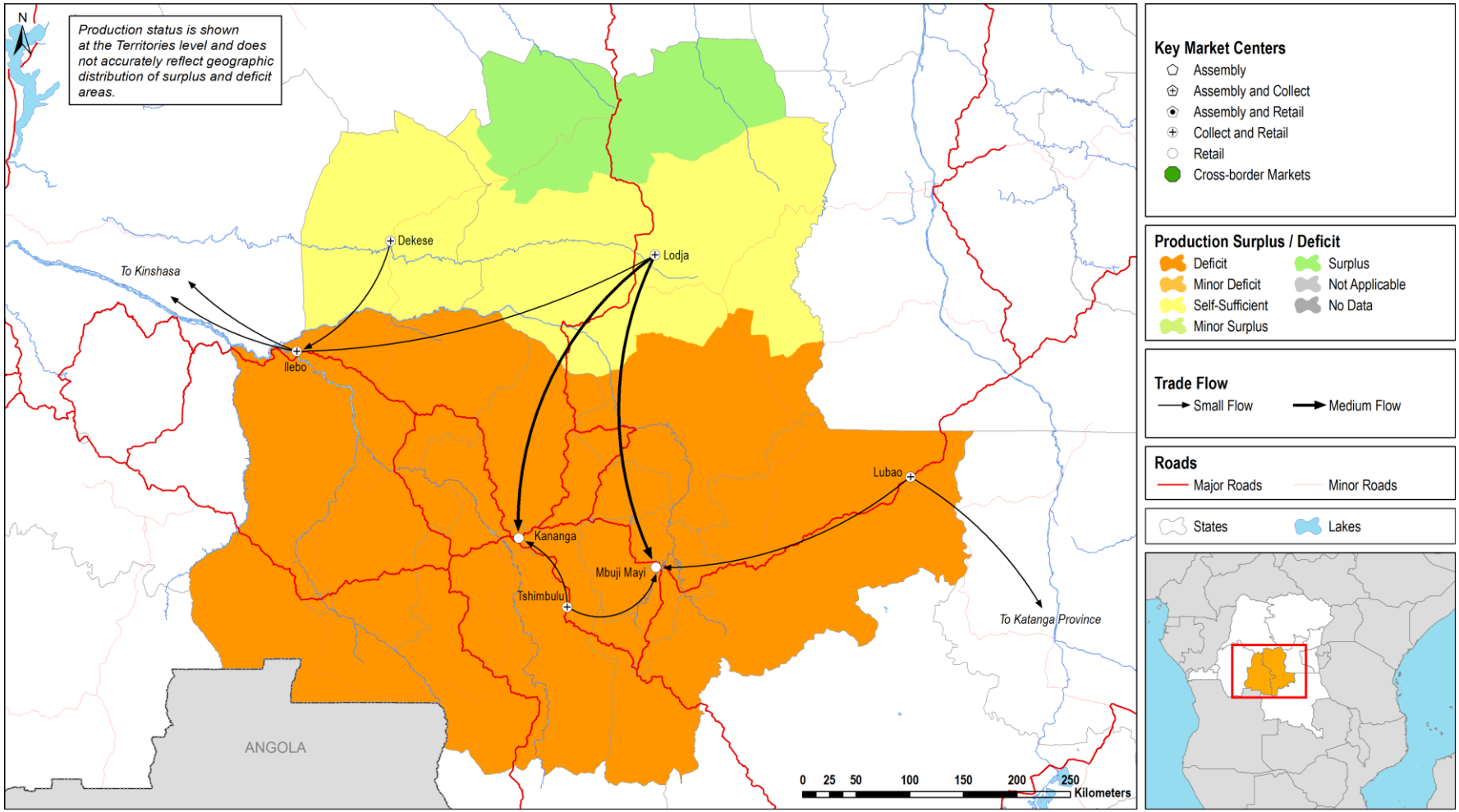
Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015), Tanzania Ministry of Industry, Trade and Marketing (2014).

Figure 106 Imported rice prices (US$/kg) in the Kasaï Provinces and regional and international markets, 2009-2014



Source: Authors' calculations based on FAO AND MADR (2014); Oanda (2015), Pakistan Bureau of Statistics (2014).

Figure 107 Kasaï Oriental and Kasaï Occidental Provinces rice production and trade flow map



Source: Authors' estimates based on FEWS NET Markets and Trade workshop proceedings in Mbuji-Mayi, Kasai Oriental Province (May 2015).

7. Key Remaining Information Gaps

Research on several remaining topics could help improve the understanding of staple food markets in eastern DRC:

- The implications of conflict and mining on agricultural production in affected areas, including but not limited to Ituri District (Orientale Province), Walikale territory (North Kivu Province), Shabunda and Mwenga (South Kivu Province), and Tanganyika (Katanga Province).
- The extent to which local governments can support the adoption of improved seed varieties and production practices (including improved production techniques to combat pervasive plant diseases).
- The extent to which underlying soil fertility is a constraint to expanding agricultural production versus maintaining pre-existing soil fertility via improved production practices and how this varies by agro climatological zone. The FEWS NET assessment team believes there are certainly areas where production could be expanded further by improved soil maintenance techniques (including areas of the Kivus that have been affected by BWX and resulting soil erosion).
- The assessment team learned about opportunities and challenges associated with market-based food assistance programs in eastern DRC, but that topic was not the focus of this report. FFP may consider carrying out additional follow-up work to better understand the extent to which market-based food assistance programs (voucher or cash programs, including but not limited to food fairs) have localized or generalized impacts on staple food markets in eastern DRC.
- The contribution of NGO/IGO support to increasing dry bean production in North Kivu Province.
- The discussion in this report about the drivers of the strong import dependence of South Kivu province draws upon evidence from existing literature and key informants. Two main drivers have emerged: (1) the effects of ongoing conflict has reduced staple food production in the most historically productive areas; and (2) local land tenure arrangements have made it difficult for plantation land with absent owners (or lands that have been abandoned altogether) to transition to cultivation by small-scale producers and support staple food production (rather than cash crops). FFP may consider supporting additional research to learn more about these dynamics and how activities can be designed to better support increased staple food production in South Kivu Province.
- The research for Orientale Province focused on priority territories and districts in the easternmost part of the province. Further research will be needed if FFP wants to know more about staple food markets elsewhere in the province.
- The consumption patterns discussed throughout this report were gathered through discussions with key informants, focusing primarily on local populations. However, in a context as dynamic as the eastern DRC, verifying these patterns is essential. For example, the consumption patterns of local populations of a given area may be considerably different from those of displaced populations residing in the same geographic area at a given point in time. Furthermore, consumption patterns differ across livelihood zones. Further research will be needed if FFP is interested in learning more about consumption patterns of specific populations.
- The assessment team found that access to formal lines of credit is among the largest challenges for traders in the assessment focus areas. The FEWS NET assessment revealed that large-scale traders involved in importing goods from regional and international markets generally had better access to financing, but also cross-subsidize their economic activities. For example, in North Kivu Province, one trader was involved in pharmaceutical trade and used the profits from that business to self-finance staple food purchases,

processing, and storage. The assessment teams met with women's groups that pool funds to help fill member financing gaps. As a general rule, this is a major constraint that appears to be more acute in rural areas than in urban ones. FFP should may consider supporting follow-up research related to this issue in the future.

8. Market Monitoring Plan

The components of the following market monitoring recommendations for the DRC draw on the findings from the preceding Staple Food Market Fundamentals report, a key component of FEWS NET's Markets and Trade Knowledge base for the DRC (Figure 108). 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 108 FEWS NET's approach to market monitoring and analysis

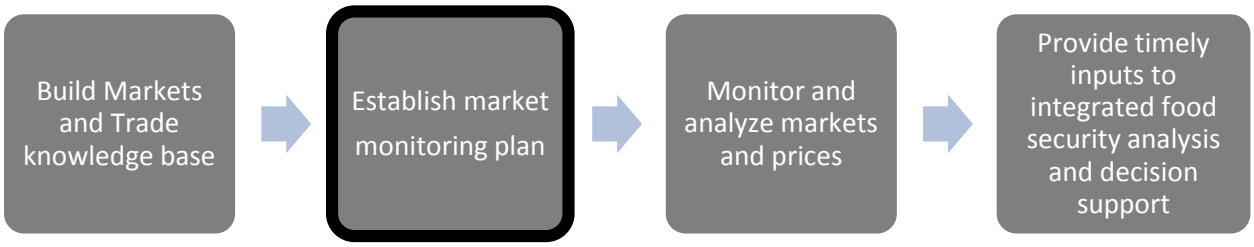


Table 20 The DRC market monitoring plan	
Common monitoring indicators across all provinces in eastern DRC	1. Despite substantial deficits in the eastern provinces, local domestic agricultural production (seasonal or annual) is clearly an important factor that will determine food availability in the DRC. Monitoring agricultural production results is difficult given the paucity and sometimes contradictory nature of agricultural statistics in the DRC. 2. The exchange rate is particularly important for understanding the CIF (cost insurance freight) price of regionally traded and internationally imported commodities. 3. For imported rice and palm oil, it would be useful to monitor both international market trends and the status of negotiations between the private sector and the local government, as those negotiations often constitute the price discovery process for those imported staple foods. These could be monitored via local FEC representation, as the FEC plays a key role in commodity imports and is actively engaged in these conversations. 4. Conflict and displacement will continue to have localized impacts on market activities (market functioning, supply, and price trends) in the near term. Understanding the status of market activities in affected areas and the operation status of key marketing corridors linked to affected areas will likewise be essential. 5. Given the important market linkages between the easternmost provinces of the DRC and neighboring Uganda, Rwanda, Burundi, Tanzania, and Zambia, monitoring production, stock levels, and market trends (including export policies) in those countries would be helpful, as those will influence trade with the DRC. 6. Eastern DRC will continue to receive food assistance via various modalities in the near term. Monitoring food assistance programs may provide insights into observed market and price trends. 7. The local government in the DRC has no national or local food security stocks.

Table 20 The DRC market monitoring plan	
North Kivu and South Kivu Provinces	1. North Kivu Province is nearly self-sufficient in most locally produced commodities. Local production is therefore a key indicator of local food availability, as well as export potential to neighboring South Kivu Province. 2. South Kivu Province is structurally deficit in nearly all staple foods. Monitoring trade flows from North Kivu Province and imports from neighboring countries is essential to understanding food availability there. 3. Traders in Goma and Bukavu play key roles in coordinating trade across the Kivu Provinces. Monitoring availability and prices on their main wholesale and retail markets would serve as indicators for the broader marketing system. 4. For the "*grand nord*" of North Kivu Province, it would be helpful to monitor availability and prices in Beni. The port of Uvira in South Kivu Province is an important transit point for goods shipped from Kigoma (Tanzania). Monitoring imports and prices there can therefore have implications for the province's larger marketing system.
Orientale Province	1. Orientale Province is nearly self-sufficient in most locally produced commodities. Local production is therefore a key indicator. 2. Three main marketing basins exist in Orientale Province. It would be helpful to monitor staple food prices in each of those basins as they are not strongly integrated among themselves. At a minimum, monitoring should take place at the central point of those basins (Kisangani, Bunia, and Isiro), as markets in those areas play the role of barometer for neighboring districts and territories. 3. For the easternmost part of Orientale Province, monitoring the status of informal commodity trade flows with Uganda would be helpful. This is particularly the case for maize flour, milled rice, and dry beans, which are regularly traded in Bunia (eastern Orientale Province).
Katanga Province	1. Katanga Province is structurally deficit in most locally produced commodities. Flows and import parity prices of commodities, especially maize, coming in from Zambia and Tanzania are therefore key indicators. On the Zambian border, the focus should be on informal flows, while on the Tanzanian border the focus should be on formal flows. 2. There are three main marketing basins in Katanga Province. It would be helpful to monitor staple food prices in each of those basins as they are not strongly integrated among themselves. At a minimum, this monitoring would take place at the central point of those basins (Lubumbashi, Kalemie, and Kamina), as markets in those areas play the role of barometer for neighboring districts and territories. 3. Conflict in the central area around Kabalo and Mitwamba, and towards the north around Nyunzu, greatly and often constrain the availability of supplies and market functioning in those areas. Therefore, monitoring the status of conflict in those areas will be helpful to understanding the extent to which commodities can flow into those areas. 4. Infrastructure development, especially roads, in the eastern half of the province will help indicate progress in availability, timeliness, and quantity of flows of commodities reaching markets.
Kasaï Oriental and Kasaï Occidental	1. The Kasaï Provinces are nearly self-sufficient in cassava, maize, and beans. Local production is therefore a key indicator. 2. Mwene Ditu is the center of commerce (the most dynamic in the two provinces), with all goods arriving from Katanga Province transiting there before heading further north to both capitals. Thus monitoring would help better understand what commodities do arrive from outside the province. 3. With two marketing basins that touch but do not overlap substantively, it would be useful to monitor trade flows from Kananga to Tshikapa in Kasaï Occidental Province, and to monitor the flows from Mwene Ditu to Mbuji-Mayi.

Annex 1. Priority Assessment Areas Identified by Food for Peace

Province	Commune/Territory	District[34]
Kasaï Occidental	Kananga	Kananga
Kasaï Oriental	Mbuji-Mayi	Mbuji-Mayi
Katanga	Kabalo	Tanganyika
Katanga	Kalemie	Tanganyika
Katanga	Malemba-Nkulu	Haut-Lomami
Katanga	Manono	Tanganyika
Katanga	Mitwaba	Haut-Katanga
Katanga	Moba	Tanganyika
Katanga	Nyunzu	Tanganyika
Katanga	Pweto	Haut-Katanga
Maniema	Lubutu	
Maniema	Punia	
North Kivu	Beni	Beni
North Kivu	Bulengera	Butembo
North Kivu	Bungulu	Beni
North Kivu	Goma	Goma
North Kivu	Karisimbi	Goma
North Kivu	Kimemi	Butembo
North Kivu	Lubero	
North Kivu	Masisi	
North Kivu	Muhekera	Beni
North Kivu	Mususa	Butembo
North Kivu	Nyiragongo	
North Kivu	Rutshuru	
North Kivu	Ruwenzori	Beni
North Kivu	Vutamba	Butembo
North Kivu	Walikale	
North Kivu	Goma	
Orientale	Irumu	Ituri
Orientale	Mambasa	Ituri
South Kivu	Fizi	
South Kivu	Kabare	
South Kivu	Kalehe	
South Kivu	Shabunda	
South Kivu	Uvira	
South Kivu	Walungu	

[34] North and South Kivu and Maniema Provinces did not have districts at the time of the assessment, as the administrative division from one to three provinces took place during the 1980s. Therefore, the “districts” listed for these provinces are actually “territories.”

Annex 2. Workshop Participants' Names and Organizations

North and South Kivu Provinces Markets and Trade Workshop Participants May 12-13, 2015 Goma, North Kivu Province, DRC	
Participant Name	**Participant Affiliation**
Musyenene Kakule	Economie Nationale
Cleophas Kambale Simisi	COOCENKI
Kambale Ngoange	ITAPEL
Samuel Kasereka Vunyatsi	ITAPEL
Masudi Balolwa Evariste	SNSA-Agri
Yves Mungura	Inspection Agricole/Uvira
Bugingo Kinoganoga	
Celestin Mbirizi Masirika	IPAPAEL/Walungu
Mastaki PolePole	World Vision/Bukavu
Mbilizi Generose	Bec/WAFHPCO/Bukavu
Bertin Birindwa	Trésorier Marché Central Bukavu
Nsimire Anto	Trader
Jean Marie Byamungu	World Vision
Bugingu K. Claude	Cellule Agricole/Kalehe
Leopold Kahavi	SNSA-Agri
Serugendo Alphonse	ADEVEVI
Katsuva Malemo Ezechiel	UPROVEPA asbl
Lubzanzadio Andre	CRS/Goma
Joel Siku	WFP
Romain Kasendula	WFP
Guillaume Kahomboshi	FAO
Paul Henri Bansoba	PPV/IPAPEL/North Kivu
Hangi Tembo	Ministry of Agriculture
Jean Claude Paluku	FOPACINK

Orientale Province Markets and Trade Workshop Participants May 18-19, 2015 Bunia, Orientale Province, DRC	
Participant Name	**Participant Affiliation**
Ilengelenge Ikende	IDAPEL/Isiro
Bonaventure Lokadi	IDAPEL/Bunia
Janvier Muhima	WFP/Bunia
John Namegabe	ALDI/Bunia
Robert Congdon	Samaritan's Purse/Bunia
Owendiongo Lowa	SNSA/Kisangani
Bokwala Bokope	Bureau du prix du marché/Kisangani
Suel Elysé	IDAPEL/Isiro
Tshongo Bulume	FENAPEC/Isiro
Lundi François	Bureau de commerce/Isiro
Dupe Wele Dijon	RIMA/Bunia
Ali Djuma	Syndicat de Défense des Intérêts/Mambasa
Madrakele Mokkobe	IDAPEL/Buta

Katanga Province Markets and Trade Workshop Participants May 18-19, 2015 Lubumbashi, Katanga Province, DRC	
Participant Name	**Participant Affiliation**
Baudouin Kakudji	Ministry of Agriculture
Alex Bukasa	SNSA/Lubumbashi
Innocent Tsyizubu	INS
Mukalayi Nsenga	FEC/Lubumbashi
Joseph Twite Maloba	HYPERPSARO
Tambwe Muhemedi	APEDE
Placide Mukebo	BDD
Mutombo Mbumba	Ministry of Agriculture/Kamina
Mbuyu Kanda	Ministry of Agriculture/Kabongo
Robert Kibwe	Ministry of Agriculture/Kalemie
Mwana Ngoy	Ministry of Agriculture/Kongolo
Jean Masambu	Ministry of Agriculture/Dilolo
Mukaz Makal	Ministry of Agriculture/Sakania
Mussati Mangala	Ministry of Agriculture/Kasenga
Cesar Kasongo	Ministry of Agriculture/Kolwezi
Lazare Milambo	FAO
Arnold Kanku	WFP
Lisa Bofwa	CRS
Crispin Kitenge	CRS
John Tshomba	University of Lubumbashi
Bertin Kalombo	SNSA/Lubumbashi
Mutombo Wamwena	Ministry of Agriculture

Kasaï Oriental and Kasaï Occidental Provinces Markets and Trade Workshop Participants May 18-19, 2015 Mbuji-Mayi, Kasaï Oriental Province, DRC	
Participant Name	**Participant Affiliation**
Daddy Tshimanga Lumbala	IPAPEL/Mbuji-Mayi
Jeannot Tongo Bulanda	Transporteur/privé
Isidore Tshipanza Mukendi	Council for Agriculture and Rural Management/Mbuji-Mayi
Louis Nikita Kabeya	Société Civile Cadre de Concertation
Degaul Koleela	CARITAS
Willy Mulimbi	CRS
Norbert Kinvula Mimbu	INADES/Kananga
Martin Sul'a yand	Inspection Urbaine de l'Agrigulcuture/Muene Ditu
Jean Bosco Ilunga Mavita	Développement Rurale/Muene Ditu
Olivier Mulamba Kombe	INERA/Ngandajika
Evariste Ntumba Kabinda	Développement Rurale/Kananga
Georges Kabongo	Division Provinciale de la Planification
François Mutombo	Ministère de l'Agriculture
Dr. Pierre Kabamanyi Nutmba	IPAPEL/Kananga
Teddy Mbala Mbuyi	FEC/Mbuji-Mayi

Annex 3. Data Collection and Information Verification Methods

The analysis presented in this report draws on the combined knowledge provided by key informants, secondary data, and a literature review (grey literature and other published documents and reports). The data collection and verification process took place in four phases:

First, FEWS NET collected secondary historical data related to staple food and cash crop production and marketing (subnational production volumes, trade flows, and price data) as well as relevant key reports and publications. These data and reports were reviewed to provide FEWS NET staff with general background information.

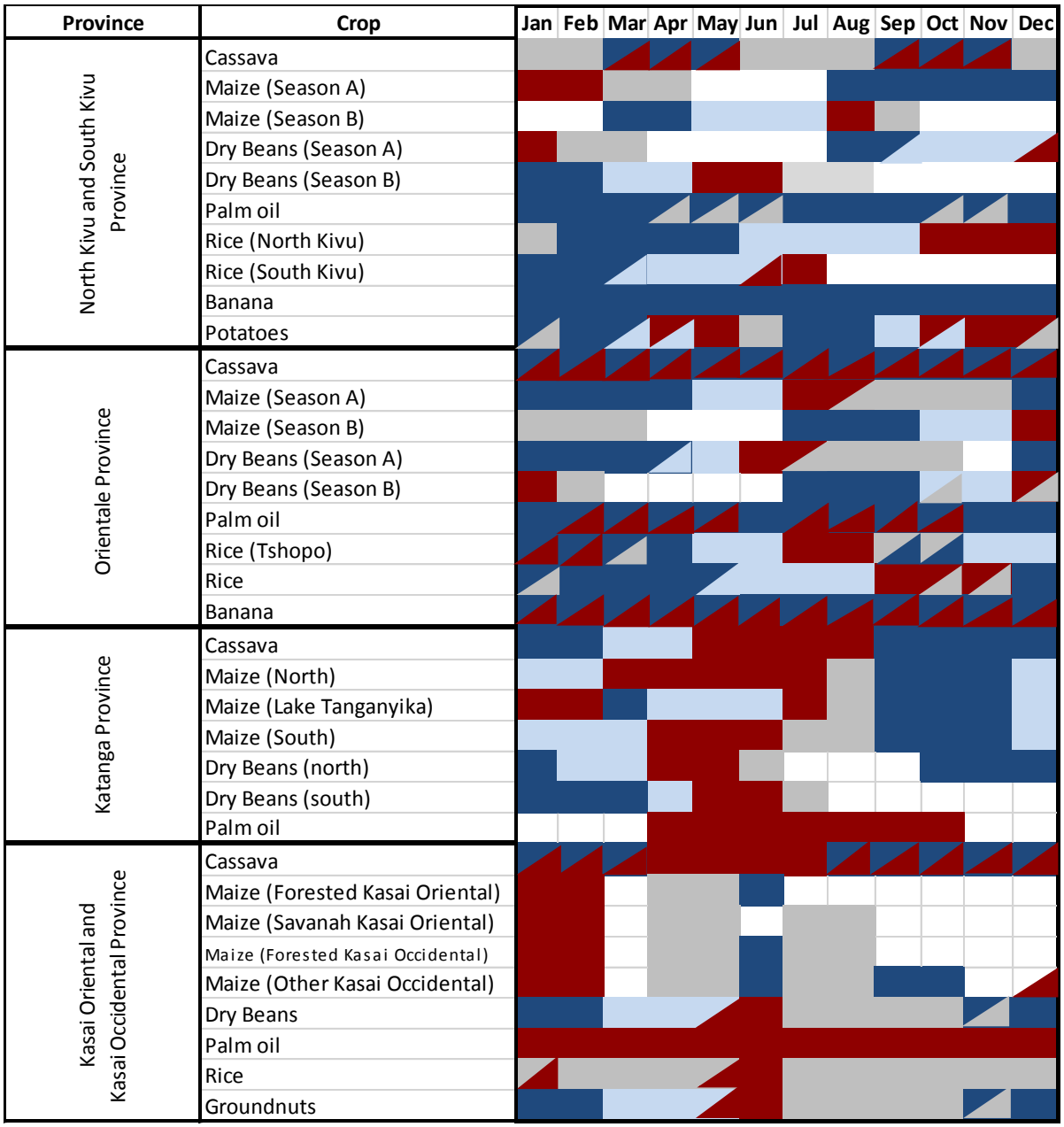
Second, FEWS NET organized a national-level workshop with key informants (private sector, the broader humanitarian and development community, government, and USAID and FEWS NET staff) over the course of two days to help improve the understanding of the key issues outlined above, including:

a. Cross-cutting issues that affect all staple food, cash crop, and livestock markets
b. Commodity **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)
c. **Commodity market behavior/conduct** (purchase or selling behavior of key actors in the marketing chain)
d. **Commodity market performance outcomes** (production trends, inter- and intra-annual price variability, and regional or international competitiveness)
e. Key indicators to monitor
f. **During this workshop, the draft commodity-specific production and market flow maps and industry diagrams were sketched out**. The role of FEWS NET staff in the workshop was to: facilitate these conversations and discussions between various groups and individuals who might not normally have a chance to interact; ask clarifying questions; and take notes.

Third, once the initial data and literature review and the workshop were completed, FEWS NET identified key remaining information gaps, which were then filled through follow-up conversations with key informants (those present at the workshop and newly identified individuals) and rapid field assessments.

Fourth, the draft report was reviewed by FEWS NET field office, regional office, and home office staff, as well as by key partners. The final version reflects comments and feedback from technical reviewers.

Annex 4. Crop Production and Marketing Calendars in the DRC[35]



Legend	
	Planting
	Growing
	Harvest
	Marketing

Source: Author's estimates based on FEWS NET Markets and Trade Stakeholder Workshop Proceedings (2015a). Mbuji-Mayi, Kasai Oriental Province, DRC, May

[35] The crop production and marketing calendars presented in this annex are distinct from the seasonal calendars presented in FEWS NET livelihoods and decision support products. The calendars presented in this Market Fundamentals report show crop-specific activities at the provincial level, while other FEWS NET calendars present activities at the livelihood zone or national level.

Annex 5. Average Crop Production by Province, 2006-2011 (MT)

Province/District	Maize	Rice (Paddy)	Cassava	Banana	Dry Beans
Bandundu	**179,903**	**22,503**	**3,196,593**	**16,924**	**N/A**
Kwango	29,420	2,502	687,578	2,016	N/A
Kwilu	134,444	15,002	1,767,949	8,133	N/A
Maï-Ndombe	12,450	4,292	563,129	5,087	N/A
Plateau	3,589	707	177,937	1,688	N/A
Bas-Congo	**18,061**	**17,246**	**1,317,235**	**29,014**	**12,302**
Bas-Fleuve	8,398	10,321	409,037	16,840	6,470
Cataractes	3,027	6,731	614,447	8,732	4,795
Lukaya	6,636	194	293,751	3,442	1,037
Equateur	**135,169**	**20,904**	**1,703,743**	**38,446**	**249**
Equateur	13,402	46	261,770	6,104	N/A
Mongala	29,323	13,561	366,332	7,144	26
Nord-Ubangi	12,749	1,554	186,147	6,104	130
Sud-Ubangi	60,557	1,835	541,653	14,416	66
Tshuapa	19,138	3,908	347,841	4,678	27
Kasaï Occidental	**169,329**	**13,908**	**958,229**	**11,765**	**15**
Kasaï	87,807	7,188	477,647	6,812	4
Lulua	81,522	6,720	480,582	4,953	11
Kasaï Oriental	**191,929**	**38,667**	**1,156,392**	**14,248**	**682**
Kabinda	107,849	2,813	537,066	5,868	412
Sankuru	38,387	35,854	432,189	7,392	104
Tshilenge	45,693	N/A	187,137	988	165
Katanga	**208,360**	**11,478**	**2,761,782**	**10,096**	**5,097**
Haut-Katanga	35,949	998	456,767	1,889	1,352
Haut-Lomami	54,883	884	1,110,245	3,253	1,092
Lualaba	15,803	1,489	343,895	911	243
Tanganika	101,725	8,107	850,876	4,044	2,411
Kinshasa	**13,274**	**2,142**	**18,775**	**1,074**	**138**
Kinshasa	13,274	2,142	18,775	1,074	138
Maniema	**29,123**	**38,773**	**610,839**	**16,548**	**22**
Maniema	29,123	38,773	610,839	16,548	22
North Kivu	**45,115**	**11,523**	**326,451**	**106,447**	**52,425**
Beni	7,769	4,576	165,275	32,230	12,417
Lubero	15,279	3,215	69,901	26,464	12,592
Masisi	9,319	194	36,372	10,732	14,737
Rutshuru	11,579	168	37,672	16,027	11,617
Walikale	1,169	3,370	17,231	20,993	1,062
Orientale	**96,918**	**107,222**	**1,935,793**	**191,354**	**16,070**
Bas-Uélé	14,536	22,424	219,142	49,432	45
Haut-Uélé	29,074	42,750	438,300	31,892	550
Ituri	43,615	14,015	693,963	46,245	15,475
Tshopo	9,693	28,033	584,388	63,785	N/A

Province/District	Maize	Rice (Paddy)	Cassava	Banana	Dry Beans
South Kivu	**15,826**	**25,987**	**579,655**	**15,867**	**24,749**
Fizi	1,232	957	18,573	670	979
Idjwi	1,807	N/A	55,600	1,360	2,694
Kabare	930	N/A	19,882	528	3,068
Kalehe	3,614	661	197,248	5,273	5,037
Mwenga	909	912	58,039	1,550	498
Shabunda	4,257	19,951	64,533	2,674	105
Uvira	665	3,363	64,723	3,388	3,240
Walungu	2,414	143	101,057	425	9,128
Grand Total	**1,103,007**	**310,353**	**14,565,487**	**451,783**	**111,749**

Source: Authors' calculations based on SNSA (2012).

Annex 6. Storage Facilities in Focus Provinces of the Eastern DRC

Storage capacity in the DRC varies considerably within and between provinces. Three main types of storage could be used to support food assistance distribution in the DRC: private sector storage facilities, government storage facilities (public), and storage facilities owned or operated by NGOs, donors, and international organizations (humanitarian).

Storage Facilities in North and South Kivu Provinces

	Location	Owner	Available for Rent or sublease	Capacity MT / m²	Type	Condition
North Kivu Province						
Private	Goma, Port	MUSANGANYA	Yes	336 m²	Concrete	Acceptable
Private	Goma, Port	SNCC	Yes	330 m²	Concrete	Acceptable
Private	Goma, Derrière Coopec IMARA	Maman Lily	No	336 m²	Concrete	Acceptable
Private	Goma, Quartier Monusco	Rukara	Yes	640 m² 100 m²	Concrete	Acceptable
Private	Goma Quartier Monusco	Jean Fet	Yes	225 m² 225 m² 300 m²	Concrete	Acceptable
Private	Goma	TMK	Yes	648 m²	Concrete	Acceptable
Private	Goma, quartier Katindo	Suma	Yes	540 m²	Concrete	Acceptable
Private	Goma, Aéroport	Jean Fet	Yes	225 m²	Concrete	Acceptable
Private	Goma	AKIPHAR	Yes	5,000+ MT	Concrete	Good condition
Humanitarian	Goma	WFP	Yes	5,000+ MT	Concrete	Good condition; 6 facilities.
Humanitarian	Goma	World Vision	Yes	unknown	Concrete	Good condition
Humanitarian	Goma	CRS	unknown	280 MT	Concrete	Good condition
South Kivu						
Public	Uvira	Port de Kalundu	Yes	6,500 MT	Concrete	May require rehabilitation
Public	Walungu	Local government	Yes	200+ MT	Concrete	Acceptable
Public	Bukavu	unknown	unknown	unknown	Various	Varied
Humanitarian	Kalehe	World vision	unknown	unknown	Concrete	Good condition
Humanitarian	Minova	World vision	unknown	unknown	Concrete	Good condition
Humanitarian	Bukavu	WFP	Yes	3,500 MT	Concrete	Good condition

Source: Authors' estimates based on visual inspection and/or interviews with facility managers during field assessment and DLCA Logistics Cluster (2014).

Storage Facilities in Orientale Province (Ituri and Haut-Uele Districts)

	Location	Owner	Available for Rent or sublease	Capacity MT / m²	Type	Condition
Private	Bunia	unknown	Yes	100 MT	Concrete	Acceptable
Humanitarian	Dungu	WFP	Yes	3,400 MT	Rub-hall	Acceptable
Humanitarian	Faradje	WFP	Yes	800 MT	Rub-hall	Acceptable
Private	Ituri district	unknown	Yes	unknown	Rub-hall	Acceptable

Source: Authors' estimates based on visual inspection and/or interviews with facility managers during field assessment and DLCA Logistics Cluster (2014).

Note: In Bunia town, there are approximately 10 facilities that can handle up to 100 MT each, 10 facilities that can store up to 50 MT, and 8 small facilities that can handle up to 20 MT. Therefore, total commercial storage capacity is estimated to be between 1,500 and 1,700 MT.

Storage Facilities in Katanga Province						
	Location	Owner	Available for Rent or sublease	Capacity MT / m²	Type	Condition
Private	Kasumbalesa	PACIFIC	Yes	N/A	Concrete	Acceptable
Private	Lubumbashi	MALABAR (EP Ville)	Yes	N/A	Concrete	Acceptable
Private	Lubumbashi	AMICONGO	Yes	N/A	Concrete	Acceptable
Private	Lubumbashi	various	Yes	N/A	Concrete	Acceptable
Humanitarian	Lubumbashi	WFP	unknown	3,500 MT	Concrete	Under construction/repair
Humanitarian	Kalemie, SNCC/Gare	WFP	No	1,200 MT	Concrete	Acceptable
Humanitarian	Kalemie, WFP office	WFP	No	400 MT	Wiik hall	Acceptable
Humanitarian	Kalemie, WFP office	WFP	Yes	400 MT	Wiik hall	Acceptable
Humanitarian	Kalemie, WFP office	ACTED	Yes	200 MT	Concrete	Acceptable
Humanitarian	Kalemie, WFP office	UNICEF	Yes	800 MT	Concrete	Acceptable
Humanitarian	Kalemie, Centre ville	FAO	Yes	1,500 MT	Concrete	Acceptable
Humanitarian	Moba	WFP	unknown	800 MT	unknown	unknown
Public	Lubumbashi	Various	unknown	unknown	Concrete	Acceptable

Source: Authors' estimates based on visual inspection and/or interviews with facility managers during field assessment and DLCA Logistics Cluster 2014.

Storage Facilities in Kasaï Occidental and Kasaï Oriental Province						
	Location	Owner	Available for Rent or sublease	Capacity MT / m²	Type	Condition
Kasaï Occidental Province						
Public	Luebo, Port	ONATRA	Yes	600 m²	Concrete	Repairs needed
Private	Luebo, Port	Catholic Dioceses in Kananga	Unknown	330 m²	Concrete	Repairs needed
Public	Kananga	SNCC	Yes	640 m²	Concrete	Repairs needed
Kasaï Oriental Province						
Public	Bene Dembele, Port	ONATRA/SCTP	Yes	640 m²	Concrete	Acceptable
Public	Mwene Ditu	SNCC	Yes	600 m²	Concrete	Acceptable
Private	Dibindi, Mbuji-Mayi	MLB ETS	unknown	unknown	Concrete	Acceptable

Source: Authors' estimates based on visual inspection and/or interviews with facility managers during field assessment.

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