Market Assessment

Sierra Leone
Market Component of Cash & Voucher Feasibility Study

July 2013
Data collected in March 2013

WFP
World Food Programme
wfp.org

Acknowledgements

Acronyms

BRAC:	Bangladesh Rural Advancement Committee
CFSVA:	Comprehensive Food Security and Vulnerability Analysis
CILSS:	Comité Inter Etat de Lutte contre la Sécheresse au Sahel
CO:	Country Office
CPI:	Consumer Price Index
MAFFS:	Ministry of Agriculture, Forestry and Food Security
FAO:	Food and Agriculture Organization
FEWS NET:	Famine Early Warning System Network
GDP:	Gross Domestic Product
GNF:	Guinean Frank
GoSL:	Government of Sierra Leone
HQ:	Headquarters
MAFFS:	Ministry of Agriculture, Food Security and Forestry of Sierra Leone
MT:	Metric Tons
MoA:	Ministry of Agriculture
RB:	Regional Bureau
VAM:	Vulnerability Assessment and Mapping
WFP:	World Food Programme

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Executive Summary

Despite the progress made towards peace-building and growth after an 11 year- long civil war, food insecurity remains a major challenge in Sierra Leone. In fact, during the lean season (June to August), 45% of the population, or 2.5 million people, do not have access to sufficient food (WFP, 2011).

To address this issue, one of the activities of the WFP Sierra Leone Country office is to expand the cash and voucher programme that has been implemented in the Western, Southern and Northern areas of the country.

This study aims at analysing the local market conditions and traders response capacity around Freetown, Port Loko, Kambia and Moyamba to evaluate the feasibility of a cash programme expansion.

73 traders and 14 head of markets as well as representatives of the Ministry of Agriculture and Food Security were interviewed during the mission. Hence, the assessment is a review of secondary data and field questionnaires.

Key messages that can be retained from the assessment are:

- Although domestic food production has recovered since the end of the conflict in 2002 and provides a major part of Sierra Leone's staples rice and cassava as well as pulses, oils, vegetables and fruits, the country remains in food deficit.
- Households spend on average 63% of their total expenditure on food. Borrowing money to buy food is common (52%). Three quarters of the population rely on markets as their main source of food. Under such conditions, the trend of high and rising food prices poses a serious threat to food security in Sierra Leone.(CFSVA/WFP2011)
- Permanent urban markets offer a large number of sellers and buyers especially during the lean season when households are mainly depending on markets for their food needs. Nevertheless, markets are poorly organized and conduct remains unstandardized.
- Markets in Sierra Leone are only partially integrated for the main commodities. In over 90% of the cases, retailers reported that commodities would origin from a market within the same district. Hence, markets are divided in regional networks.
- Despite taking advantage of the good economic performance, inflation remains high. In 2012, the average inflation stood at 12.9%, which is significantly lower than in 2011 where it stood at over 16%. However, this remains equivalent to the 5-year average (13%).
- During the lean season, households mainly rely on markets to meet their food needs. In Sierra Leone, rural households spend up to 65% of total expenditure on food and urban households 58% (CFSVA, 2011).

- 83% of retailers have less than 100 customers per week. The low number of customers could be explained due to their purchasing power, less diversity of food in the markets, and high fragmentation of markets.
- A majority of traders provide credit to their clients and this share has increased by 38% since last year.
- The market survey found that on average 63% of retailers vs. only 30% of wholesalers have a dedicated bank or postal office account for their business.
- Overall, traders (80%) estimate to have the capacity to respond to an increase in demand by 25% under current price conditions.
- An increase in demand by 25% would likely result into an increase of commodity prices the coming six months. More than 80% of traders believe that there would be a temporarily change, thus the risk of price inflation appears to be lowest. However, this allegation needs to be watched carefully while implementing a cash and voucher activity. The same proportion of retailers and wholesalers expect price increases to be sustained in the coming six months.

1. Background, objectives and methodology

1.1. Background

Sierra Leone has an estimated population of 5.7 million and its capital city Freetown has a population of over 800,000. Administratively, the country is divided into four provinces -- northern, southern and eastern -- and the western area where Freetown is located. Each province is divided into districts (12 in total) and each district is subdivided into chiefdoms (150 in total).

The country has two main seasons: the rainy season lasts about seven months from April to November peaking in July and August and the dry season lasts from December to May. The most common natural hazard in Sierra Leone is flooding, which occurs mainly from June to September. Two-third of the population survives on subsistence agriculture, which represents more than half of the national income.

While significant progress has been made towards peace-building, the resettlement of displaced populations, reconstruction of war-affected communities and rehabilitation of productive household and community assets, the country still faces enormous challenges. Poverty levels are very high, with 70% of the population living below the national poverty line of US$2 day. In terms of human development, its ranking has improved from 180 out of 182 countries in 2009 to 177 out of 187countries for the 2012 classification of the Human Development Index.

The war caused the displacement of 30% of the population with farms abandoned as Sierra Leoneans fled into towns. However production of food and export of crops has to some extent recovered since the end of the war. But despite this, Sierra Leone remains highly dependent on food imports, and has been heavily affected by the 2008 global food price crisis. The 2009 global financial crisis hit the country hard too, with remittances and revenues from minerals dropping by 30% and the current high levels of commodity prices pose a great risk to the country's food security status.

In Sierra Leone, rice is most consumed staple and the greatest caloric contributor to consumption, followed by palm oil and cassava.

1.2. Objectives and Methodology

This market assessment was initiated by the Sierra Leone Country Office (CO), as precedent to expand their cash and voucher activities in the year 2013.
Hence the objectives of the assessment are to analyze:
- household dependence on markets
- the environment of markets
- market structure and its conditions
- the performance of markets, especially the capacity of market's to respond to increased demand

The analysis of secondary data includes WFP reports, food balance sheets, price time series and production data made available by the National Statistics Office. Additionally, WFP, supported by BRAC and PLAN International conducted a wholesale and retail trader survey in selected regions. A mission from HQ and Regional Bureau prepared two tools i.e. questionnaire for wholesalers/retail shops, and a market questionnaire providing an overview of the markets within a town. Following an enumerator training, a field testing and review in the CO, tools were revised and finalized according to the local context. The purpose of the main instrument was to collect data on trader characteristics, food flows and storage strategies, traders' constraints and their capacity to increase supply but also information pertinent to their financial capacity.

The CO selected the Western, Northern and Southern areas for the assessment. More specifically districts of Freetown, Kambia, Port Loko and Moyamba were chosen for the implementation. 12 enumerators collected data around 6 cities.

Markets were selected according to their proximity to the implementation area and importance in the region. Traders were selected randomly ad hoc on the market site according to their availability. The target was to interview at least 3 retailers and 3 wholesalers per market covering the main commodities.

The traders' questionnaire was submitted to 73 traders across the selected districts. Furthermore, a market questionnaire was administered to 14 market heads with regard to themes such as price determination, transport and changes in the business environment and general market environment.

Meetings with the Ministry of Agriculture were arranged on the 12th of March.

The trainings and reviews were carried out from the 11th to the 13th of March. Enumerators including participants from BRAC and PLAN International departed for actual data collection on the 13th.

For quality control purposes, team leaders had to review the questionnaires and sign them off.

Primary and secondary data were analysed with statistical software packages SPSS 17.0.

1.3. Limitations

Time constraints were very important and the whole assessment had to be carried out during the week from the 10th to the 16th given the availability of the Country office, Headquarter and Regional Bureau staff. Because of the limited time, the sample remained of small size. Furthermore, food price data in Sierra Leone is very limited and long time series were not available for analysis. Price analysis focuses on one or two year trends.

2. Macro-economic factors

Real gross domestic product (GDP) growth increased from 4.9% in 2010 to 6% in 2011 and is estimated to rise gradually above 10% in 2012 and 2013 driven by recovery in the mining

sector (Figure 1Figure 1). In fact, mining sector activities, particularly iron ore production, will continue to be the main driver of economic growth in 2013.

Despite this growth performance, inflation rose to 16.6% in 2010 in response to high international oil and agricultural prices on the one hand and the depreciating Leone (SLL) on the other. The rate fell to 11.41% in 2012 and is expected to further decrease, as a result of improvements in domestic agricultural production, the introduction of the new goods and services tax (GST) and the slower rate of currency depreciation.

Figure 1: GDP and Annual Inflation (Consumer Price Index Changes)
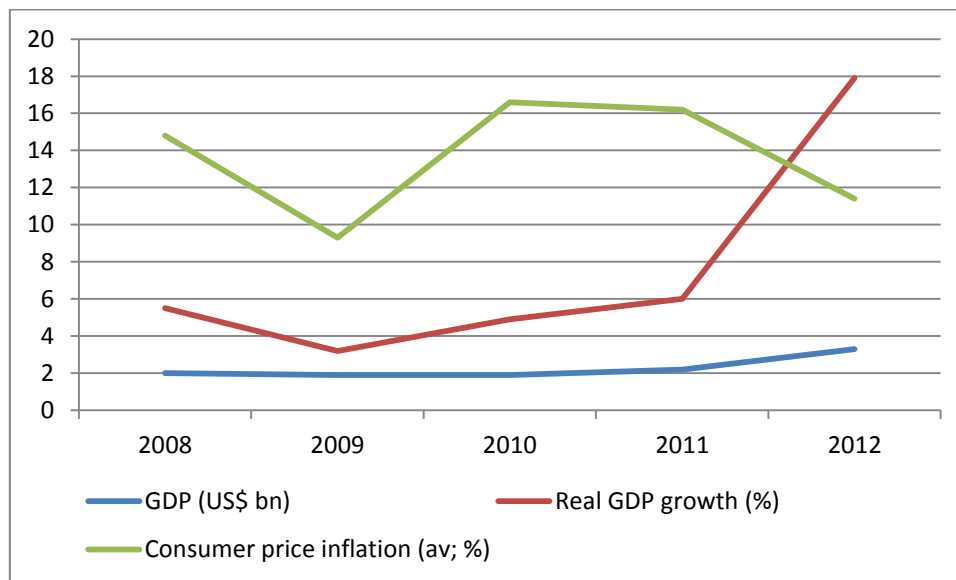
Source: Economist Intelligence Unit 2013 data set

Although Sierra Leone's monetary policy was expansionary in the second half of 2010 and early 2011, Sierra Leone's Central Bank is now tightening monetary policy controlled through the issue of Treasury bills to maintain exchange-rate stability. Hence, Treasury bill interest rates fell in 2011.

After a substantial depreciation in 2009 and further in 2011 (7%) against the US dollar, the exchange rate remains flexible but stable since 2011 and sustains the decrease in inflation. This stability has been reinforced by a strong exports growth and foreign direct investment.

2.1. Exchange rate and cross-border trade

Sierra Leone depends on neighbouring or international markets to satisfy the national demand on goods and services. The exchange rate, affects the relative prices of tradable goods and services. Transactions commonly take place in local currency (SLL) in local and cross border markets, except for imported rice where the USD dollars is the main currency used by importers.

Since 2009, SLL has declined in value compared to the US dollar (Figure 2). This shows Sierra Leone is better off exporting commodities since its currency is weak against the USD. As a consequence, the amount of commodity that can to be imported is being reduced and the

prices in the local market are maintained at high level, making difficult access to food by poor household.

Since 2011, the exchange rate GNF/SLL remained stable (less than 0.7 SLL against 1 GNF). The **Error! Reference source not found.** shows that Sierra Leone traders are better off mporting rice from Guinea; unfortunately Guinea's rice supply cannot cover the Sierra Leone's large demand.

Figure 2: Exchange rate USD/SLL
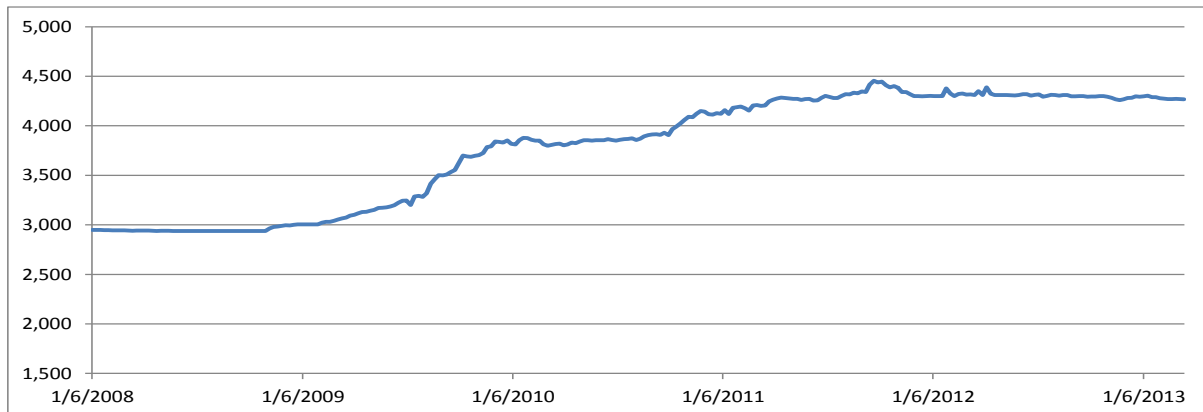
Source: Oanda.com data set

Figure 3: Exchange rate GNF/SLL

Source: Oanda.com data set

3. Food availability

Domestic food production has recovered since the end of the conflict in 2002. This is driven by a threefold increase in the area planted with rice. However, rice yields remain low and far below potential. Food imports are increasing with requirement levels due to population growth.

Domestic production provides the majority of Sierra Leone's staples rice and cassava as well as pulses, oils, vegetables and fruits. Rice is the most important crop in Sierra Leone, cultivated by farmers in all districts and occupying up to 50 percent or more of average smallholder upland acreage. The land area under rice cultivation fluctuated slightly over the past few decades and dropped significantly during the war, but is now 1.5 times the acreage devoted to rice prior to the war (currently 600,000 hectares). However, per capita production of rice was less in 2003-05 (71 kg/person/year) than prior to the war (1990-92, 80 kg/person/year). Yield per hectare has increased little over time and is basically now at levels the country obtained four decades ago; therefore, increases in production are primarily due to increases in area cultivated. The Ministry of Agriculture, Forestry and Food Security (MAFFS) estimates that in 2009 Sierra Leone is only 70 percent self-sufficient in rice production but has the potential to be well over. FAO food balance sheet data would suggest that the ratio is higher for 2012. According to MAFFS, to achieve this goal yields and area under cultivation will need to increase and post-harvest losses will need to be reduced through agro-processing technologies and facilities**.**

Figure 4 illustrates the increase of food supply since 2003.

Figure 4: Food availability in Sierra Leone 2003-2009 (thousand MT)
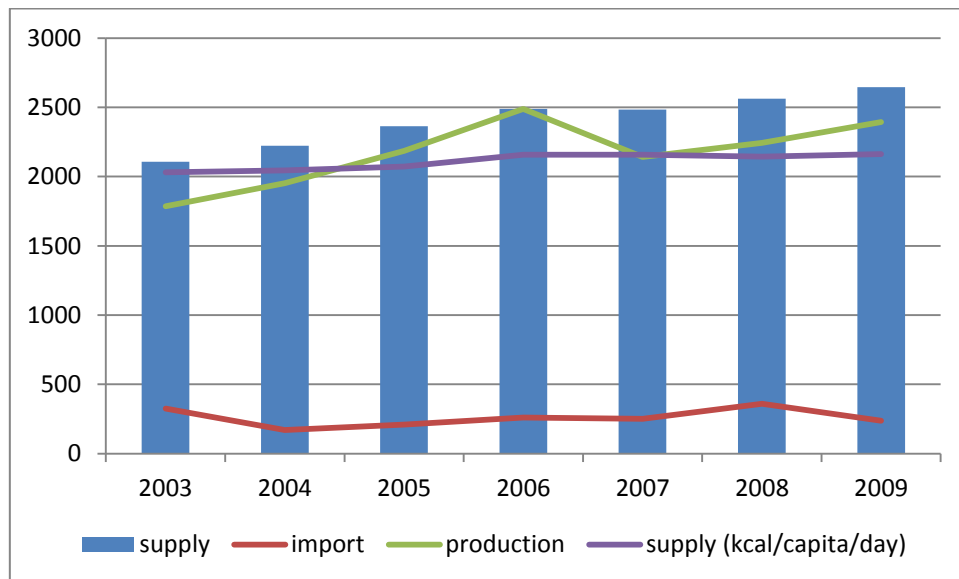
Source: FAO data set
Note: 80 food items including processed food are counted for the graph.

Rice imports may reach 15 to 30 per cent of total supply, although increasing domestic production has reduced the import dependency since 2000/02 (Figure 5).

Figure 5: Commodity production trends
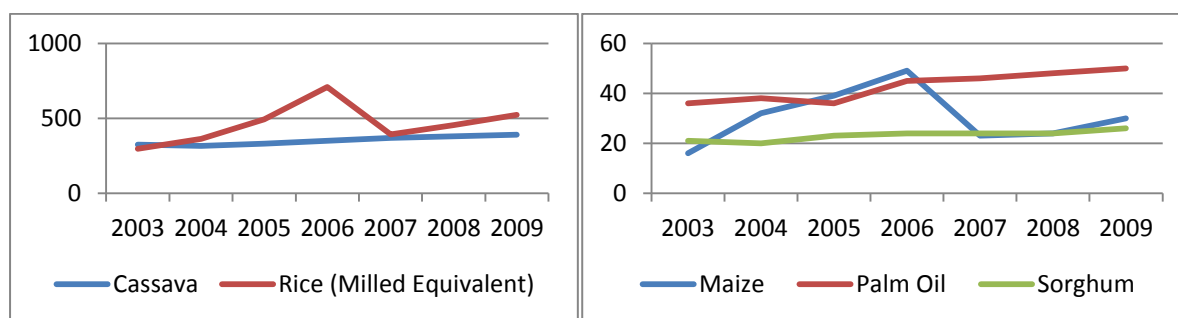
Source: FAO data set

Since May 2011 the 10 percent tax on imported rice has been suspended and exports have been banned by the Government in an attempt to curb rising domestic prices. This was followed by increasing fuel subsidies in April 2011 to reduce the price of petrol and kerosene from SLL 5 000 to SLL 4 500 (USD 1.83) per litre. The total cost of the subsidies increased from about USD 650 000 a week in October 2010 to about USD 2.5 million a week by the end of April 2011.
This resulted in a peak increase in rice imports in mid-2011 (Figure 6).

Figure 6: Value of all food imports (thousand USD)
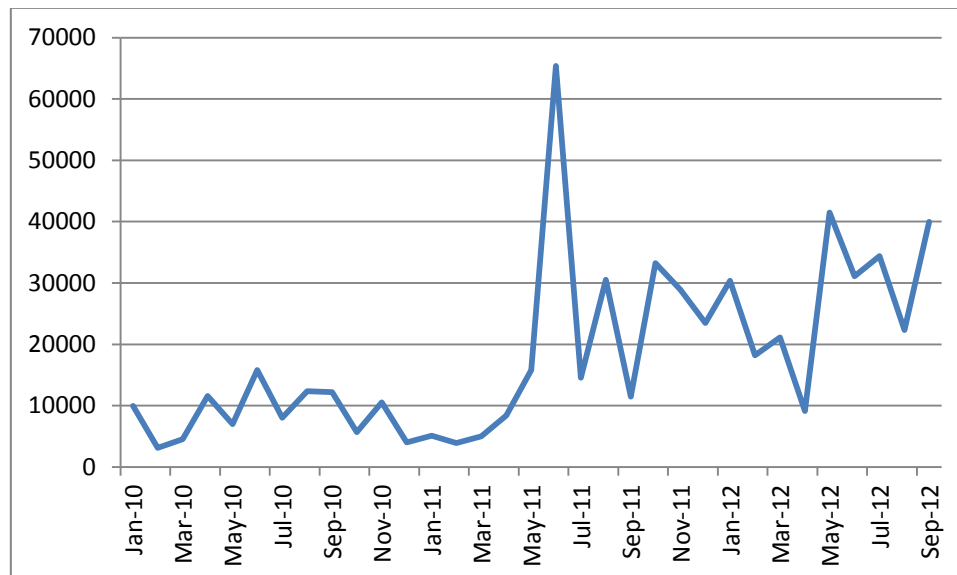
Source: Customs and Excise Department; Gold and Diamond Department (GDD) data set

The return to peace and security in Sierra Leone has led to the reestablishment of domestic, regional and international trade flows. According to the estimates available on FAOSTAT, cereal production quadrupled between 2000 and 2008 in Sierra Leone. Despite this rebound in cereal production Sierra Leone has remained a food-deficit country by a quarter of its total annual cereal requirements (WFP, 2010).

In one hand, Sierra Leone is emerging as potential food supply source for the Guinean and Liberian markets, in the other hand Sierra Leone also exports substantial quantities of local rice to Guinea. There is a strong Guinean demand for local rice, palm oil, and gari (processed form of cassava), which drives significant cross-border trade flows (WFP, 2010). Commodities analysed below include local and imported rice, palm oil, tubers and gari.

Rice

Annual per capita consumption of rice (104 kg) in Sierra Leone is amongst the highest in sub Saharan Africa. Sierra Leone requires about 530,000 MT of milled rice to meet the consumption needs of the population annually (NRDS, 2009). Imported rice from Thailand, Pakistan, India, etc. is the most commonly traded within the country (Figure 7).

Figure 7 : Sierra Leone rice imports 2002-2012
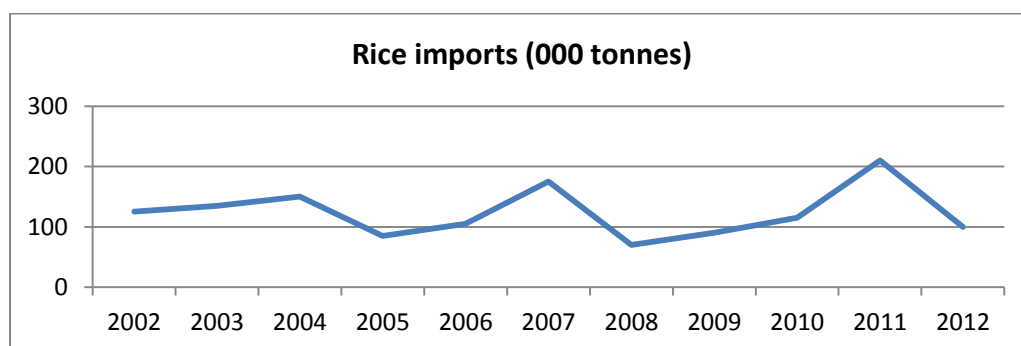
Source: Index Mundi

Cross-border flows of imported rice take place when price differentials are sufficient and also depend on the exchange with the neighboring and international countries.
The Kambia district of western Sierra Leone routinely exports parboiled local rice to nearby Conakry via Bamoi Loma international market (Figure 8). Some 360 tons of local parboiled rice entered Guinea from Sierra Leone every month during the final quarter of 2009 (WFP, 2010).

Figure 8: Flows of imported rice in Sierra Leone

Figure 9: Flows of local rice in Sierra Leone
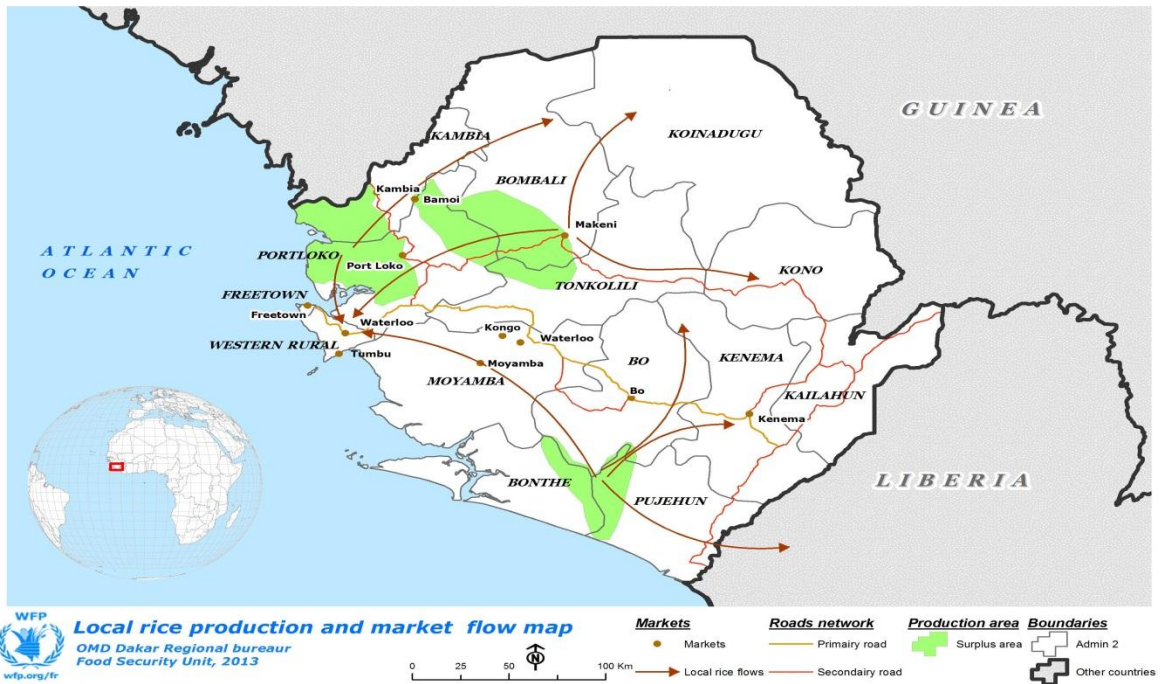
Palm oil

Palm oil, the main source of dietary fat in Sierra Leone, is also an income source to producer households. According to FAOSTAT, palm oil consumption amounted to some 232 kcal per person per day in Sierra in 2009. Palm oil is currently traded within the country and across the national borders. It flows from Sierra Leone to Guinea, Liberia, and Senegal (Figure 10). In Sierra Leone, Barmoi international market (Kambia) handles approximately 30,000 liters of palm oil every week, two-thirds of which are traded to the markets of Madina and Bonfi in nearby Conakry (WFP, 2010).

Figure 10: Flows of palm oil in Sierra Leone
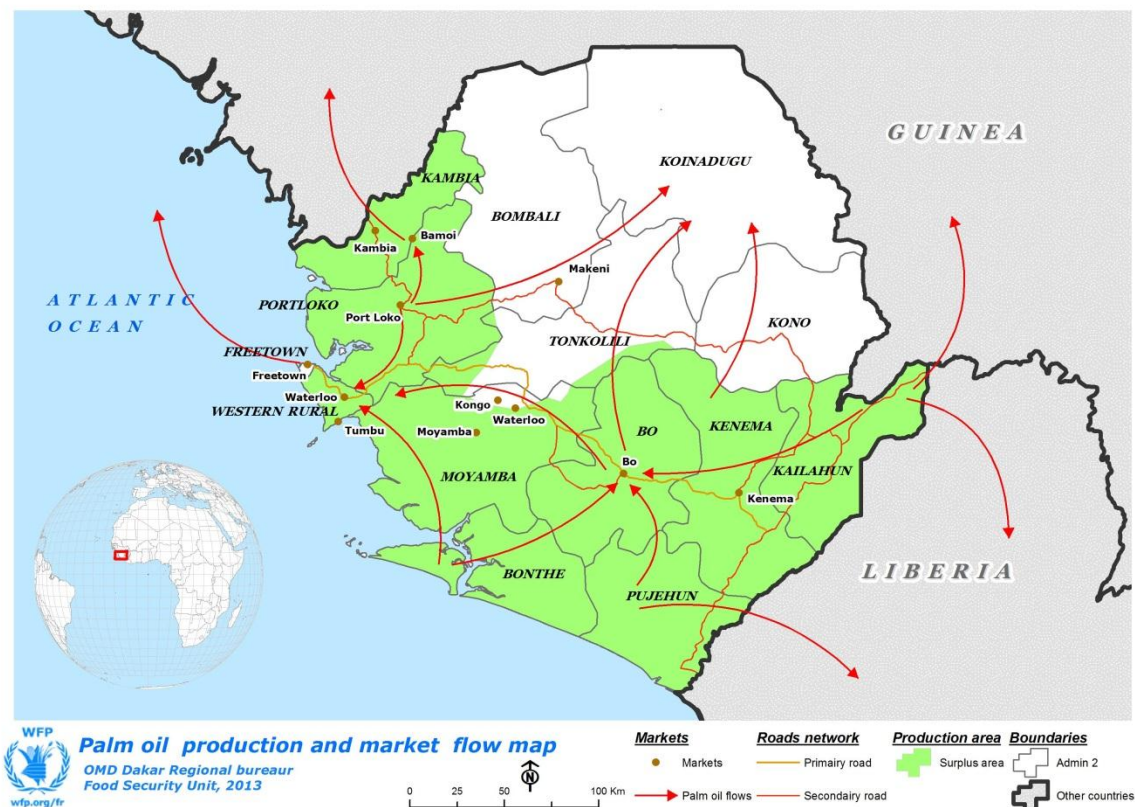
Tubers and Gari

Since the increase in food prices in 2008, gari (processed form of cassava) has become an important substitute for rice in West African urban settings. According to FAOSTAT, roots and tubers consumption amounted to some 22 kcal per person per day in Sierra Leone in 2009. Similarly to the palm oil, tubers and gari are also source of income for small farmers. Sierra Leone is potentially emerging gari supply to Guinea and Liberia (Figure 11). Gari surpluses from coastal Sierra Leone are exported to Guinea through Barmoi and to Liberia through Bo-Waterside (WFP, 2010).

Figure 11: Flows of tubers and gari in Sierra Leone
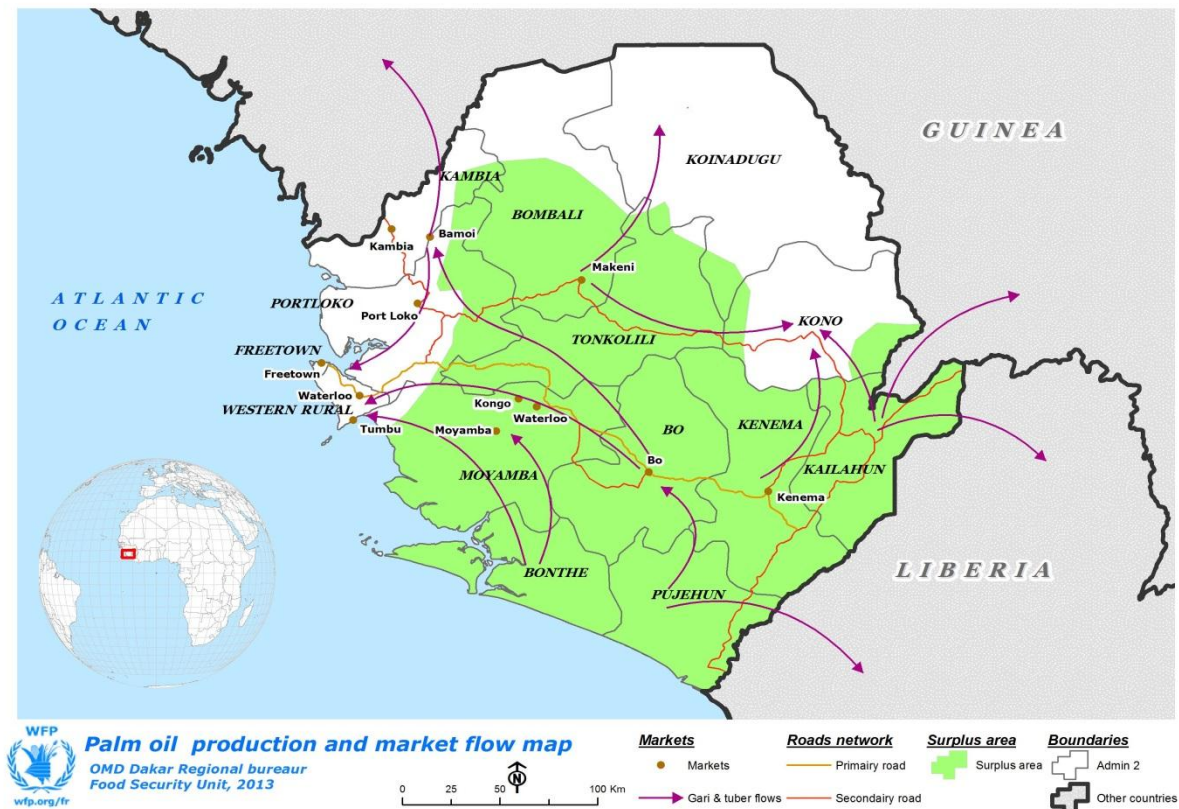
4. Market structure and conduct

This section describes the structure and conduct of food markets obtained through literature and market surveys. The market structure and conduct show how markets are made-up in terms of number and concentrations of buyers and sellers, how the relationships among market actors (traders, farmers, consumers) are built, prices formation mechanisms, competition level, the presence of monopoly power, the level of barriers to entry.

The market system is organized in three types: rural markets or collecting markets, assembly/redistribution markets, and urban consumer markets. Usually, in the permanent urban markets, there is a large amount of diversified food (imported and local food) and a large number of sellers and buyers especially during the lean season when households are mainly depending on markets for their food needs. Six firms are said to account for 90% of rice imports to Sierra Leone, which is indicative of a high degree of market concentration (WFP, 2010).
Locally produced rice is traded in a poorly organized chain in small quantities by a few wholesalers but mainly by retailers. Traders operate from stores near the major retail markets and sell to retailers by the bag. The retailers sell in local markets by cup measures which are not officially standardized. Traditional milling such as hand pounding and use of small scale steel cylinder mills constitute the major means of rice processing in the country.

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All domestic rice processing and trade in the country is currently a private sector activity. In 2009, MAFFS had in its possession 26 small scale units funded by UNDP and two large scale (1 ton/hour) mills on order funded by the Indian Government. It is understood that MAFFS intends to turn all the mills over to the private sector for operation although the modalities and mechanisms of such privatization are not clear. [1]

Figure 12: Marketing channel for locally produced rice in Sierra Leone

```
         Farmer /Producer
               ↓
  Itinerant Trader/Local Assembler
               ↓
          Wholesaler
               ↓
           Retailer
               ↓
           Consumer
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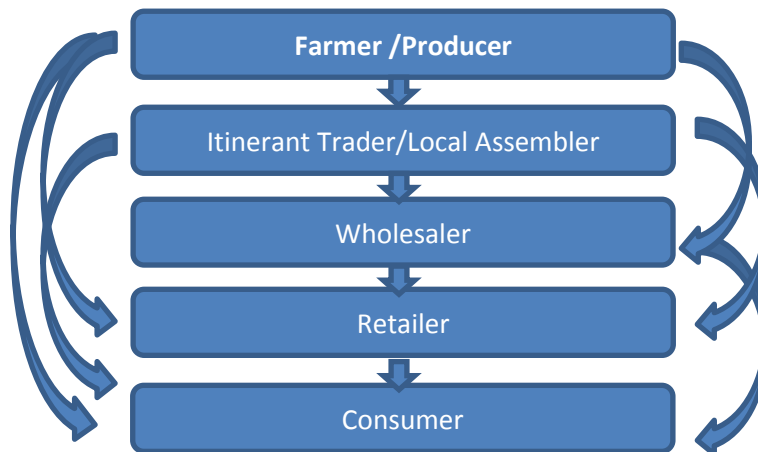
Rice marketing has enjoyed government support for a long time to ensure widespread availability, however now rice trade is undertaken by the private sector. The sector is highly concentrated with only several Lebanese traders dominating the market. The structure of the marketing system for local and imported rice is similar.

Figure 13: Marketing channel for imported rice

```
        Importer/Food aid
               ↓
          Wholesaler
               ↓
           Middlemen
               ↓
           Retailer
               ↓
           Consumer
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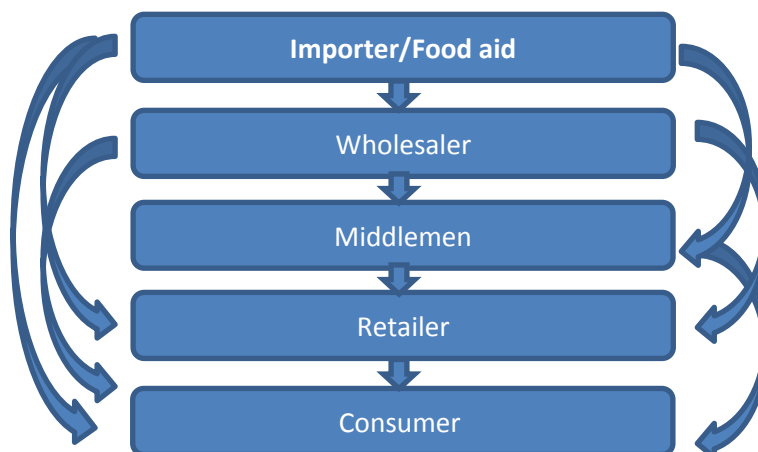
[1] Economics of Rice Production; Spencer, Deen, Wilson, June 2009

The palm oil market chain is fairly short, and functions through two channels, the first linked to local consumption, and the second linked to the regional palm oil trade (WFP, 2010). Unlike in urban markets, there are reduced variety and volume of food and a reduced number of buyers and sellers in rural markets. This could be related to the level of demand and household's purchasing power.

Guinean traders commonly offer advances to producers in order to secure much desired palm oil supplies. These advances, normally provided during the lean season, provide an important cushion for small scale palm oil producers against food insecurity. (WFP, 2011)

The market surveys found that most of the vegetable retailers are women due to their limited financial capacity to do large business. In the surveyed markets, there is virtually no barrier to entry a market, only a permit is required to start a formal business according to interviewed traders. This is an opportunity for the new traders (especially retailers) whenever the demand increases and also a good sign for the cash and voucher interventions in these areas. When the increases in demand become incentives to new traders to entry the markets, it may have a positive effect to drive down commodity prices or to maintain prices stable in the short run, but may have a reverse effect of pushing many traders to exit the markets in the long run, thus may drive up commodity prices (WFP, 2012).

According to interviewed traders, prices are commonly determined in the markets by either comparing to other market prices or simply by the law of supply and demand. There is no government interference in determining prices in markets; traders are then free to determine prices in these selected markets. As outlined in the Cross-border trade and food security assessment, Liberia and Sierra Leone in 2010, producers set the price of palm oil and local rice on more than half of markets while more than half of the markets, prices of imported rice market are determined by wholesalers, reflecting the concentrated nature of the imported rice business.

There is no pure monopoly in the selected markets. However, the study did not yield enough information to estimate the degree of competitiveness by commodity as the number of the interviewed traders by market is limited.

5. Market performance

Market analysis was carried out with the objective of understanding market functioning in the Western, Northern and Southern Areas. Specifically, it aims at investigating price patterns for a basket of commodities that play crucial role in households' food security. By doing so, the analysis mostly focuses on price changes over time, addressing the issue of price volatility which is likely to transmit uncertainty when price fluctuations are not predictable. Furthermore, it also explores whether price shocks are transmitted across markets, which can be a proxy in the definition of market integration. The latter infers at the interaction between markets, thus providing hints on proper market functioning and commodity flow within different areas.

5.1. Market integration

Despite, the lack of prices series allowing for market integration calculation, the study attempts to describe the market integration through a qualitative approach and proxies such as trader restocking times and transport conditions.

Markets in Sierra Leone are usually only partially integrated for the main commodities. In over 90% of the cases, retailers reported that commodities would origin from a market within the same district. Hence, markets are divided in regional networks. In the case of local rice, the commodity flows from surplus areas to surrounding areas. With several production areas spread over the country, rice moves from wholesale markets such as Barmoi and Makeni to smaller retails markets.

The CFSVA 2011 showed how a price shock in the main producing area of Barmoi is passed through to other national markets by calculating the beta coefficient[2]: A price change in Barmoi is almost completely reflected in the markets of Makeni, Port Loko and Kailahun (Figure 14). Prices in the markets of Lumley and Kenema react to a lesser extent while those in Bo and Wellington do not react much at all. The same analysis carried out using Port Loko as the central market yields similar results. This demonstrates that the market for rice is only partially integrated.

Figure 14: Beta coefficient – Barmoi Market
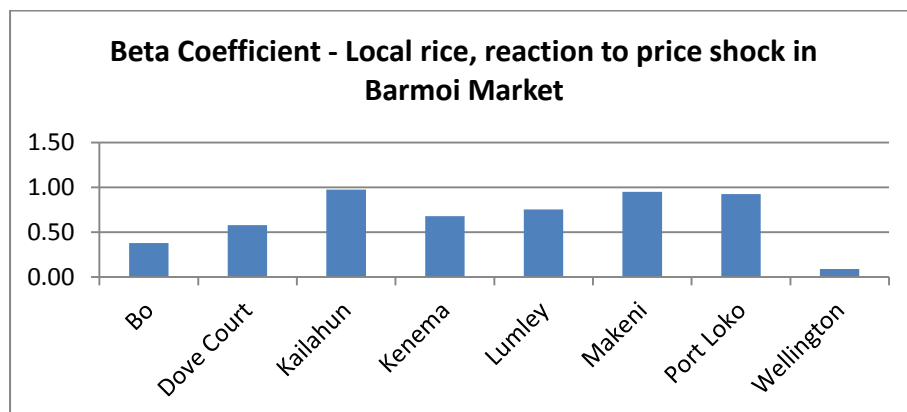
Source: WFP, CFSVA 2011

Regarding stocks, in general, over 50% of the traders said they never experienced low stocks and over 30% stated they could replenish their stock within a day. The next 30% could refill their stock within 4 days. This demonstrates the ability of markets to be refurbished quickly.

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[2] The beta coefficient is used to measure the dependency of one market on another by evaluating the covariance of a commodity price in two markets in relation to the variance of price in a central market. (0 = low covariance; 1= high covariance)

Further, roads on main axes remain of good quality allowing for relatively efficient logistics in between different regions of the country. According to the interviewees, in 50% of the cases origin and destination markets were connected by tarmac roads or highways.

Road connection between markets	
Tarmac road or highway	50%
Gravelled road	14%
Non gravelled road	28%
No road, only pathway	7%

5.2. Price trends

Due to data availability gaps, the price analysis focuses mainly on prices from 2011 to 2012 for the following commodities: i) local and imported rice, ii) cassava tubers and sweet potato, iii) beans, pigeon pea, and sesame, and iv) palm oil. (Figure 15, 16, 17 & 18)

Specifically, retail prices time series were not available at the market level in the selected areas. In addition, retail prices provided by MAFFS were aggregated at national level, therefore limiting the feasibility of a proper market integration analysis and price seasonality trends.

Nevertheless, price trends have similar patterns nearly for all commodities, showing an overall decrease from October to December. Palm oil prices, however, did not follow this pattern; instead they increase during this period. The reasons behind that, markets are less supplied while the high demand in palm oil does exist.

Figures 15 to18 show that there is a less pronounced increasing price trend. In contrast, the price of local rice, sweet potato, and pigeon pea peaked in August 2011, June 2012, and April 2011. Unfortunately the reasons behind that remain unclear.
Generally, the price of imported rice is more stable than the price of local rice. During lean season months, local rice prices increase up to 4500 leone/kg such as in August 2011. The price peaks during the lean season (July-October) then dips from October to December, the main harvest period. Such seasonal price variations indicate that local rice production is failing to meet demand (especially from Guinea), that local market infrastructure is inadequate and marketing activities undeveloped.

Figure 15: Local and imported rice price trends
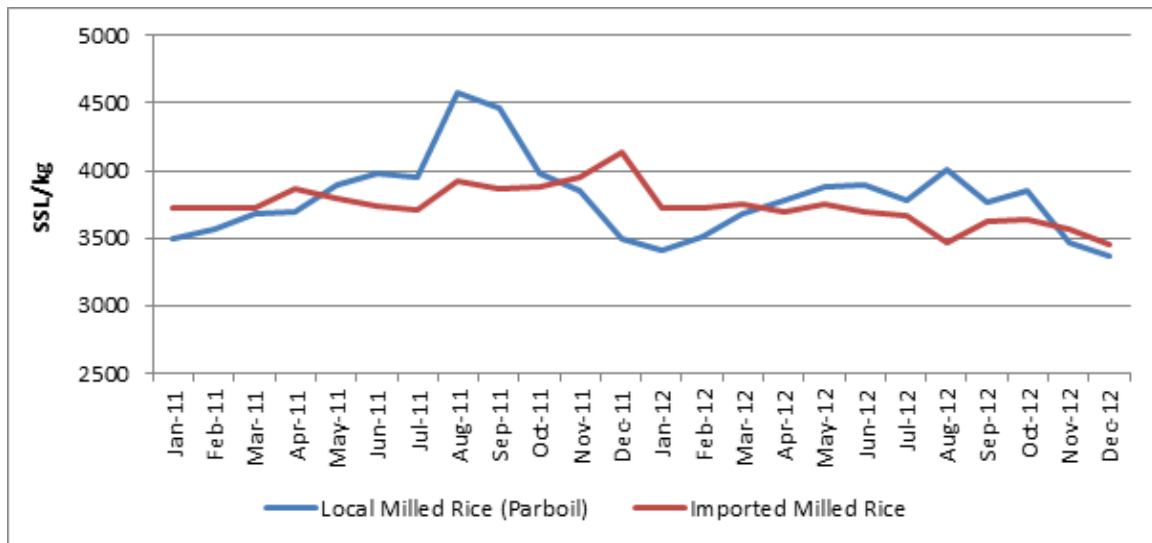
Source: MAFFS

With a high demand for cassava products such as gari and fufu nationally and regionally, prices of cassava tubers vary with the season, with an increase in April to June and again around September to October.

Figure 16: Cassava tubers and sweet potato price trends
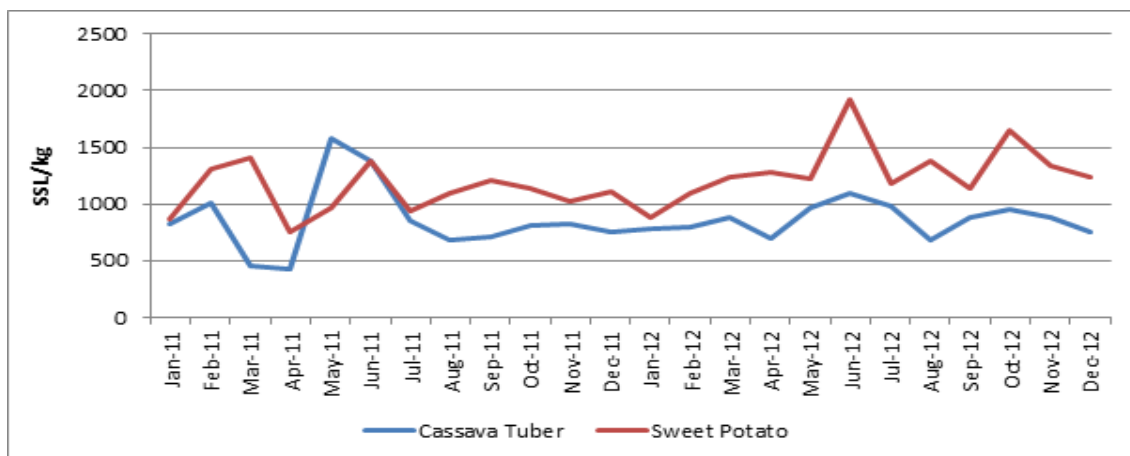
Source: MAFFS

Pulses are widely cultivated in Sierra Leone and are sold on the market or consumed within the household, especially in the North. While retail prices for broad beans have remained relatively stable, pigeon pea prices are more volatile.

Figure 17: Beans, Pigeon Peas and Sesame price trends
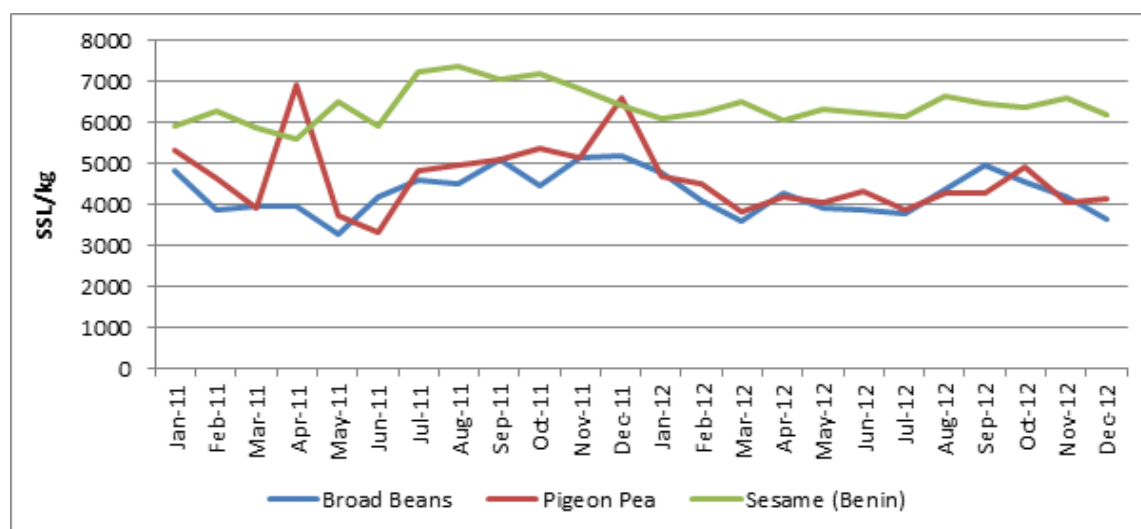
Source: MAFFS

Sierra Leone is known as an important producer of palm oil and prices are largely led by local producers. Substantial volumes of palm oil are traded in the West African region and Sierra Leone has been benefitting from this trade. Since 2007, and notwithstanding a dip in late 2008, palm oil prices have been buoyant on the international and regional markets. These high prices for palm oil have supported producer incomes and have allowed palm oil producing groups to weather the shock of high food prices in 2008. Palm oil has experienced recent increase in prices, which was reported to be caused by smuggling of produce over to Guinea.

Figure 18: Palm oil price trends
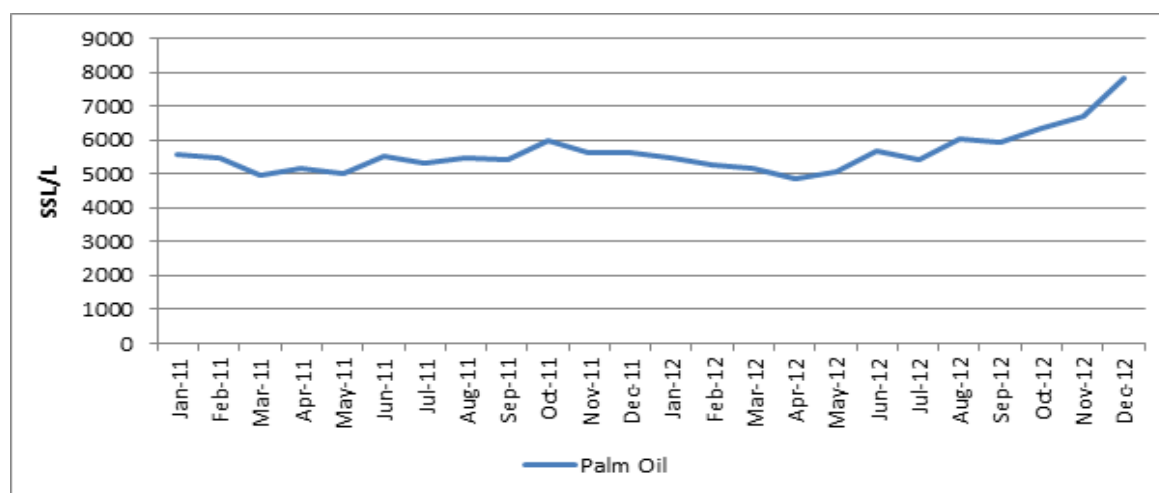
Source: MAFFS

5.3. Price Inflation

In 2012, the average inflation (January 2012 –December 2012) stood at 12.9%, which is significantly lower than in 2011 where it stood at over 16%. However, this remains equivalent to the 5-year average (13%).

The CPI, based on 2007, increases gradually in all regions at the same pace since 2010 (Figure 19), however diverges significantly between Northern and Eastern areas.

Figure 19: Inflation trends
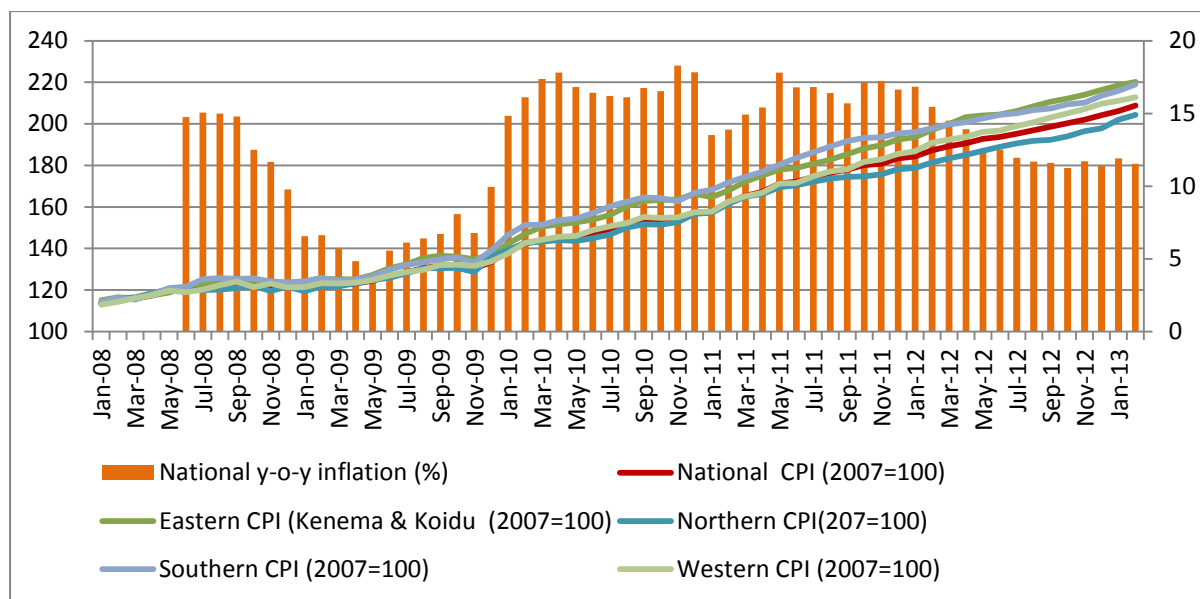
Source: Statistics, Sierra Leone

5.4. Price seasonality

Analysis of seasonality is crucial in price forecasting, and thereafter for cash and voucher transfer value setting and determination of forward contract price of local purchases. The seasonal patterns for selected commodities are reported in the following figures. The Grand Seasonal Index (GSI) is the ratio between a price at a given time and its centred moving average over the year that incorporates the full cycle of the seasonal patterns.

The crop calendar illustrated below (Figure 20) helps understand seasonal patterns in prices which are linked to the agricultural practices.

Figure 20: Sierra Leone National Seasonal Calendar
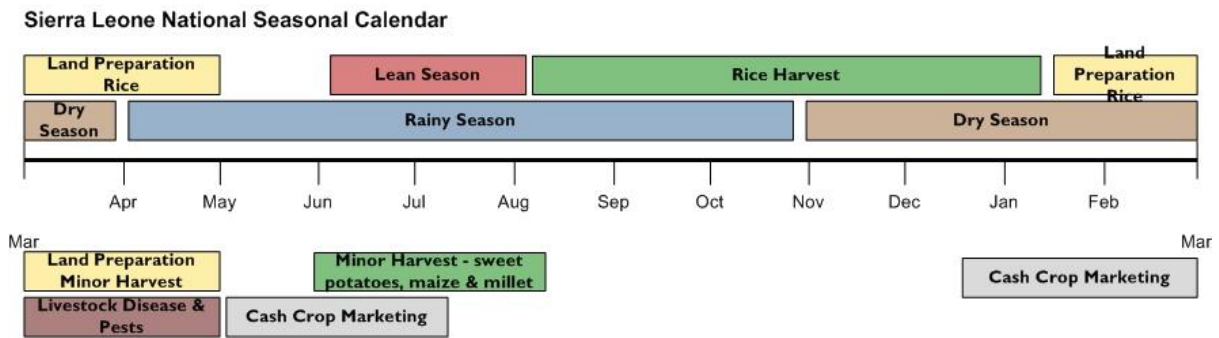
Source: FEWS NET

The grand seasonal index for local rice compared to imported rice, shows higher variation (Figure 21). The price will reach its peak during the lean season in August and will start to drop with the harvest.

Figure 21: Grand seasonal index of local and imported rice
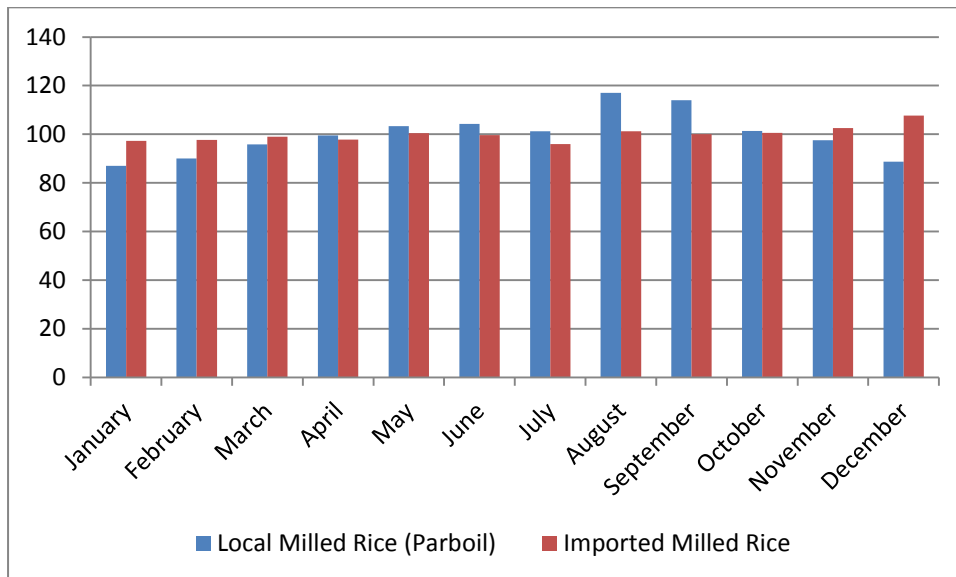
Source: MAFFS

Cassava and sweet potato prices will also know their peak just before the harvest, when availability is at its lowest point.

Figure 22: Grand seasonal of Cassava tubers and sweet potatoes
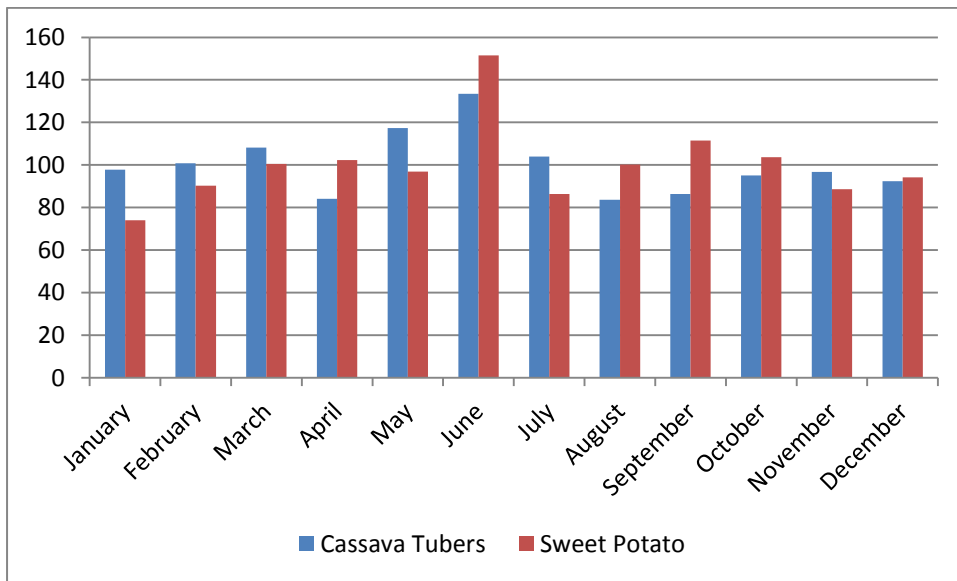
Source: MAFFS

Prices of pulses are lowest in March and increase until December.

Figure 23: Grand seasonal index of beans, peas and sesame
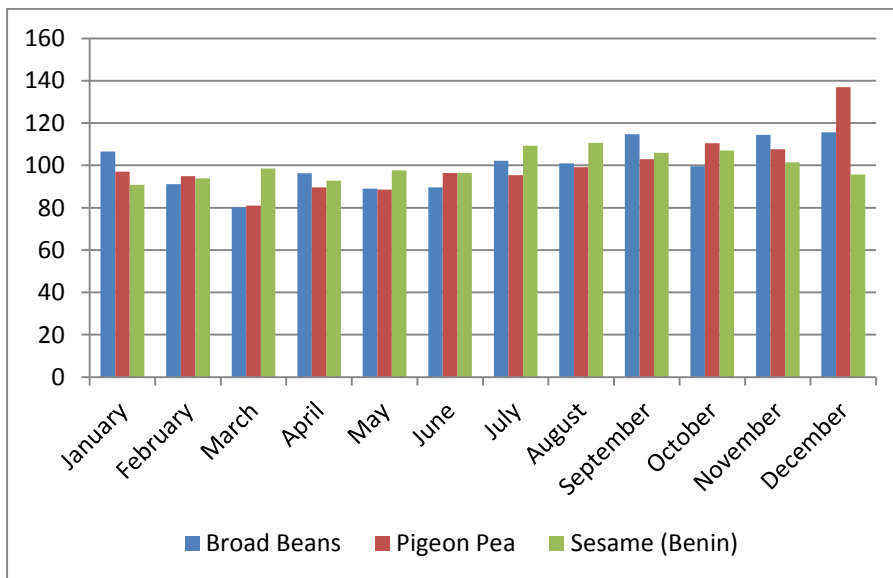
Source: MAFFS

Prices of palm oil are lowest in April and highest in October.

Figure 24: Grand seasonal index of palm oil
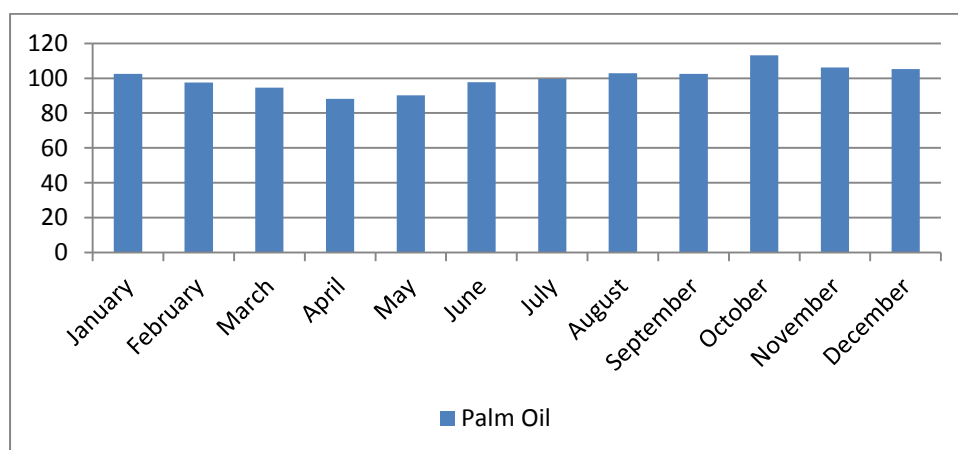
Source: MAFFS

5.5. Price volatility

Price volatility is a major source of risk for poor and vulnerable households' purchasing power. The coefficient of variation, computed as the ratio of the standard deviation to the mean, is a useful tool to compare the degree of variation of different data-series. Being an indicator for the dispersion of prices from their average, it provides useful hints to assess how prices change through the market in space and time for different actors (WFP, 2011b).

Overall the coefficient of variation ranges between 3.9% for imported rice to 44.8% for shelled Groundnuts (Figure 25). Imported rice has thus most stable prices, logically as no seasonal pattern can be identified and supply remains stable. Ready for consumption items appear to have highly volatile prices, such as, like dried fish, shelled groundnuts, sweet and hot peppers which are used a lot in local diets and are strongly influenced by demand and seasonality.

Figure 25: Coefficient of variation (2011-2012) of main commodities
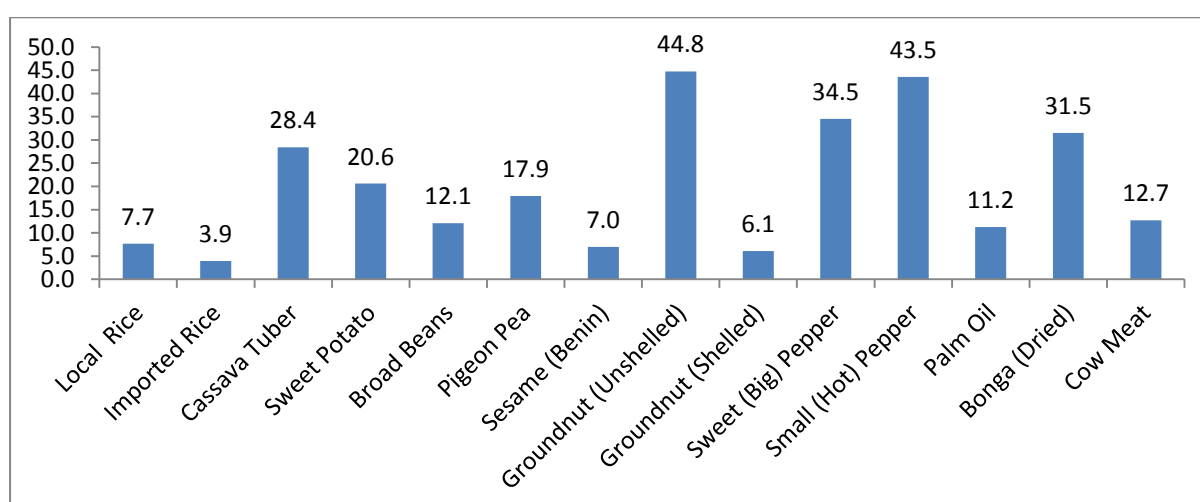
Source: MAFFS

6. Households' access to market

Besides their economic role, markets are also necessary to boost productivity, availability, and access to food. This section focuses on two majors factors of markets access: physical and financial access to food.

During the lean season, households mainly rely on markets to meet their food needs. As seen above, road connections are relatively good. Investment in infrastructure by international mining companies has improved substantially the road network, even in remote areas. This finding means, depending on how far beneficiaries are from the nearest markets, road conditions would not negatively impact households' physical access to markets. However, among market access' proxies, distance would remain a major constraint to the beneficiaries around Port Loko. The market of Port Loko is functioning poorly and does not meet the needs of consumers in terms of food availability. Households therefore supply themselves from the Bamoi Loma market. In this particular case, the cash and voucher programme should take into account the transportation cost issue.

When markets are well-functioning, prices are transmitted and thus demand can meet supply. It is commonly admitted when demand is greater than supply, price goes up; hence poor households suffer the most from the increase of price, as they spend proportionately a much larger share of their income on food. In Sierra Leone, on average households spend 63% of total expenditure on food with rural households spending an even higher portion (65%) and urban households 58% (CFSVA, 2011). A households' financial food access is commonly estimated through the calculation of the terms of trade. Previously mentioned, palm oil is the main income source for households. Figure 26 shows at national level, palm oil and imported rice prices follow the same patterns even though palm oil prices remained higher since 2011. In contrast, palm oil prices peaked in August 2012 (+30% in December 2012 compared to August 2012) while imported rice prices slightly decreased (-1% in December 2012 compared to August 2012). This means the terms of trade palm oil/imported rice were improved during this short period in 2012, thus improving households' financial food access.

Figure 26: Retail prices for imported rice and palm oil
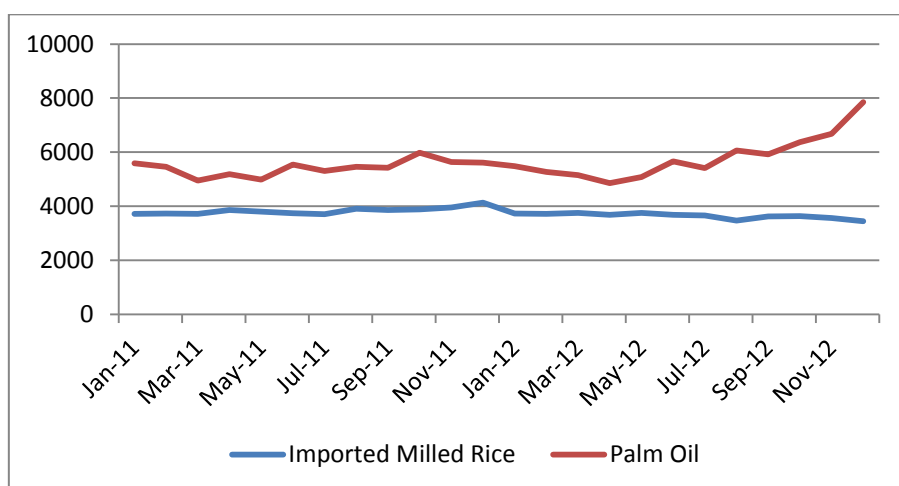
Source: MAFFS

Terms of trade palm oil/imported rice have been calculated for Freetown, Moyamba and Port Loko. Overall the terms of trade remained in favor of palm oil producer in 2012 in the three areas. On average in Freetown, Moyamba and Port Loko, a producer selling 1 kg of palm oil could obtain respectively 2.04 kg, 1.56 kg and 1.58 kg of imported rice in 2012. Figure 27 shows the terms of trade for Freetown, Moyamba and Port Loko experience the same increase towards the end of the year due to increasing palm oil prices. In general, terms of trade are highest in Freetown as palm oil prices remain highest in the capital.

Figure 27: Terms of trade price/kg of palm oil/ price/kg of imported rice
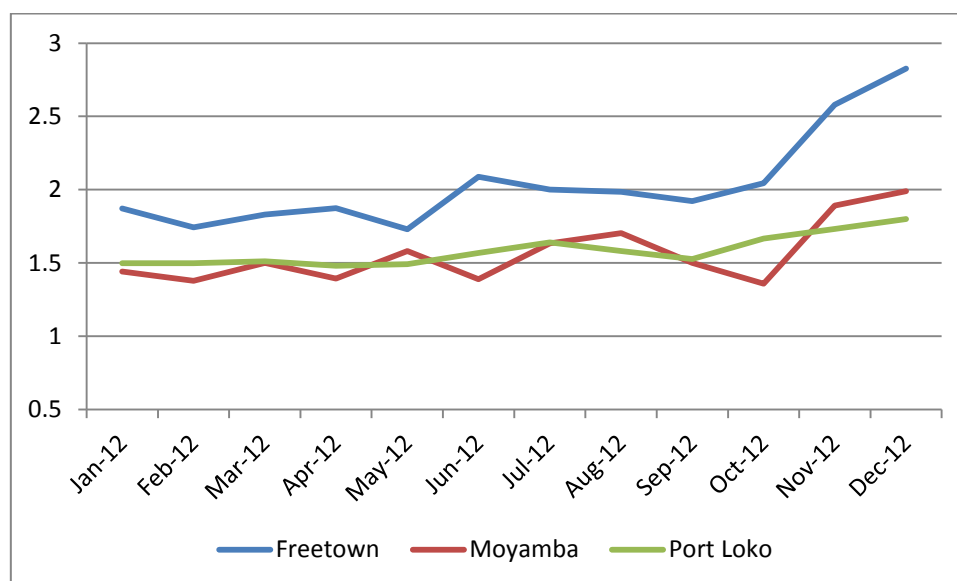
Source: MAFFS

More than 80 percent of households in Sierra Leone have reported that their constraint to have proper food consumption is rather economic access to food than availability of food (GoSL/WFP 2007). According to the VAM 2007 study, 29 percent of the population in Sierra Leone had poor or borderline food consumption in 2007. The situation was worst in Bonthe district in the South where nearly 60 percent of the population had poor or borderline food consumption. From 2005 to 2007, the situation got worse in Western Area, Port Loko, Kono and Kailahun (GoSL/WFP 2005, GoSL/WFP 2007).

In Freetown, more than 95 percent are dependent on purchasing their food (ACF 2008, WFP 2009). Both in urban, peri-urban and rural areas, almost 50 percent of household expenditures are on food, indicating poverty (GoSL/WFP 2007, WFP2009).

More recent reports of food consumption indicate an increasing trend in households with adequate food consumption after the war. There is a reported increase in dietary diversification through consumption of cassava and sweet potatoes.

Reports indicate an increasing production of these roots and tubers which far exceeds the national requirements (October 2009, Joint CILLS/FAO/FEWSNET pre-harvest assessment mission of the 2009/10 cropping season in Sierra Leone).

7. Traders assessments

The following section analyses primary data collected during the trader survey, with regards to the number of customers, sources of commodities and their general response capacity.

In total, 73 traders were interviewed in Freetown, Kenema, Bo, Moyamba, Makeni, Kambia and Port Loko. 46 were retailers, 22 wholesalers and 5 were collectors, however wholesalers can also be active in retailing. 76% of them were women and 54.8% of the respondents owned their shop for more than 3 years.

7.1. Volumes and flows

Table 1 shows 83% of retailers have less than 100 customers per week, almost 59% even less than 50 contrary to wholesalers where 100% of them have less than 100 customers per week, almost 64% even less than 50. Such number of customers appears to be low for a business type since all the surveyed markets operate daily except Bamoi Loma (this specific market only open two days per week). Reasons behind are low demand by customers due to their purchasing power, less diversity of food in the markets, and high fragmentation of markets (type and size of markets). However, the programme design perspective should take into consideration that the number of potential new customers in a cash & voucher project *vis-à-vis* the currently low number of actual clients could increase, thus a closely market monitoring will be imperative.

Table 1: Customer flows

	Number of clients last week					
	< 10	11-50	51-100	> 100	No answer	Total
Retailers	2.2	56.5	19.6	4.3	17.4	100.0
Wholesalers	9.1	40.9	22.7	27.3	0.0	100.0
Total	5.6	48.7	21.1	15.8	8.7	100.0

Source: Traders' survey in Sierra Leone, 2013

The most important traded commodities are rice (local and imported), cassava, potatoes and palm oil. The main sources of these commodities are collectors in the district in Moyamba and Kenema while they are wholesalers in the district for Bo, Bombali, Kambia, Western Rural and Urban (Figure 28). In Port Loko, traders predominantly source their commodities from either collectors in the district (50%) or wholesalers in the district especially from Bamoi Loma (50%). In general, fresh vegetables come mainly from local farmers according to retailers.

Figure 28: Source of most important commodity traded by governorate
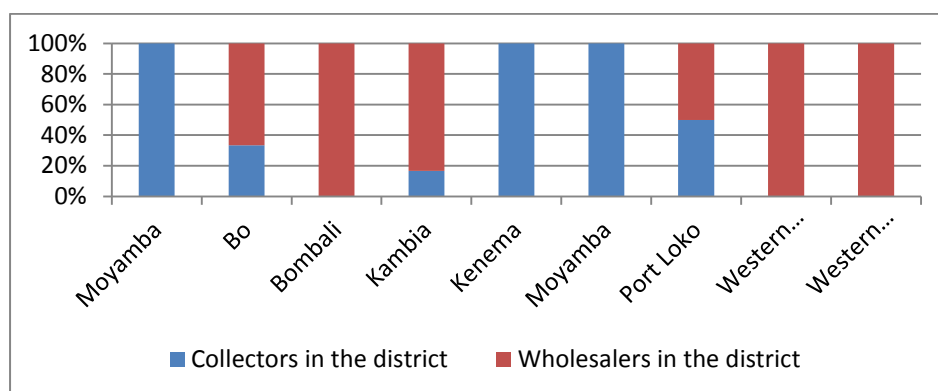
Source: Traders' survey in Sierra Leone, 2013

7.2. Credit strategy and financial capacity

Although, the "cash-and-carry" transaction takes place in the selected markets, supplying credits to customers represents one of the traders' strategies to deal with the lack of purchasing power but also to retain clients, especially when competition is high in a given market. On average, 64% of the interviewed traders provide credit to their clients (Figure 29). Retailers provide more credits to their customers than wholesalers (71% vs. 58%). However, these credits represent only 9% of retailers' total sales. The credits arrangements are not ethnic or gender based; rather they are based on inter-personal arrangements and the level of trust between the two parties. This is a common feature in West African markets. Even though the banking system does exist and is easy to access, informal credit arrangements among traders are common. Most of the retailers and wholesalers who can access the banks, find the interest rate very high; thus they then prefer credits from their friends, family, etc.

The market survey found that on average 63% of retailers vs. only 30% of wholesalers have a dedicated bank or postal office account for their business. The reasons behind this low proportion of wholesalers are either the trust with the banking system or because of the immediate need of cash whenever they would like to restock at any moment. At least 61% of retailers vs. 31% of wholesalers keep their financial records. The low percentage of financial record keeping and bank account possession is a potential constraint for a cash and voucher programme. In general, traders with structured accountability are difficult to find among retailers in either urban or rural markets, as the majority of Western African retailers are doing business informally. For this particular case, a cash and voucher should require at least a license of doing business.

Figure 29: Provision of credit to customers by traders
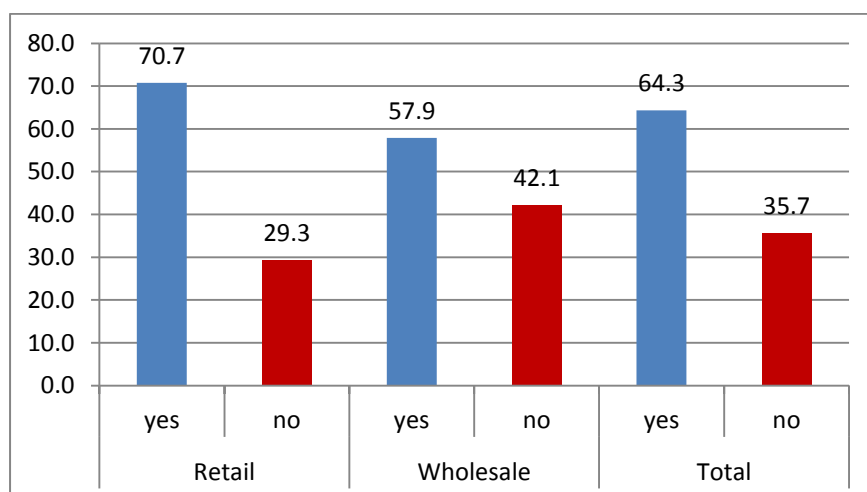
Source: Traders' survey in Sierra Leone, 2013

On one hand, fewer customers are asking for credit at wholesale level compared to last year, i.e. 36% of the wholesalers reporting a decrease, almost balancing out with 32% of wholesalers experiencing an increase (Table 2). On the other hand, 43% and 40% of retailers and collectors respectively experienced an increase of requests for credit compared to last year during the same period.

Overall, the proportion of traders that have received requests for credit has increased by more than 38% of the interviewed traders. The high proportion of traders being asked for credit is not a general case, cash and voucher programs should take into consideration this factor. Increasing household's purchasing power by giving cash would reduce their debts, consequently better fulfil traders' requirements in terms of more certain credit conditions and improved stock rotation.

Table 2: Credit request compared to last year

	Credit request compared to last year				
	Less	**More**	**Same**	**No answer**	**Total**
Retail	28%	43%	25%	4%	100%
Wholesale	36%	32%	23%	9%	100%
Collectors	20%	40%	40%	0%	100%
Total	28%	38%	29%	5%	100%

Source: Traders' survey in Sierra Leone, 2013

7.3. Stock strategy

Purchasing stock on credit is not a popular strategy among the interviewed traders (collectors, retailers, wholesalers). They rather prefer to restock by cash.

Overall, the stock rotation is fast for 55% of traders, it takes two weeks or less to sell all items they have purchased (Table 3). In addition, stock rotation is faster in urban than in rural areas due to the high food demand related to the level of purchasing power of customers.

Table 3: Stock rotation by typology of traders

	Stock rotation				
	<1week	**<2week**	**<1month**	**>1month**	**Total**
Retail	28%	35%	13%	24%	100%
Wholesale	24%	19%	29%	29%	100%
Collectors	20%	40%	20%	20%	100%
Total	24%	31%	21%	24%	100%

Source: Traders' survey in Sierra Leone, 2013

There is no issue with low or no stock for 45% of traders interviewed. Still 22% of interviewed traders have experienced stock issues every week. Overall 10% of them face stock issues at least once per month, which hints to some problems that might pose at risk the response capacity of traders. Given these findings, the situation needs to be watched carefully, especially during a potential scale-up of cash and vouchers programs as it could become a bottleneck in the supply chain.

Table 4: Stock issues by typology of traders

	Percentage of traders who have experienced stock issues						
	No	**Yes, every week**	**Yes, twice per month**	**Yes, once per month**	**Yes, less than once per month**	**No answer**	**Total**
Retail	52%	7%	11%	6%	9%	15%	100%
Wholesale	23%	41%	9%	4%	9%	14%	100%
Collector	60%	20%	0%	20%	0%	0%	100%
Total	45%	22%	7%	10%	6%	10%	100%

Source: Traders' survey in Sierra Leone, 2013

7.4. Business expansion capacity and constraints

Globally, the lack of own capital is the most important constraint to business expansion, followed by lack of credit (Table 5). The lack of credit is not related to the non-existence of

the banking system, instead traders find the interest rate too high to ask for credit. Poor transportation services remain a major issue to business expansion. According to the survey, storage facilities and capacity currently do not represent a major issue for both retailers and wholesalers. This is a good indication of the traders' capacity to respond to the increase in the demand.

Table 5: Main constraints to business expansion by typology of traders

	Main constraints preventing traders to double their sales				
	Lack of own capital	Lack of foreign exchange	Lack of credit	Poor transportation services	Lack of storage facilities
Retailer	56.5%	2.2%	17.4%	19.6%	4.3%
Wholesaler	63.6%		18.2%	18.2%	
Collector	80.0%		20.0%		

Source: Traders' survey in Sierra Leone, 2013

Overall, traders estimate to have the capacity to respond to an increase in demand by 25% (Table 6) under current price conditions; a realistic response due to the lack of capital previously mentioned as the main constraint of traders to increase their business, even though, storages facilities and adequate road transportation do exist. Traders might have difficulties to meet a potential increase in demand by 50% or 100%.

Table 6: Response capacity to increase of demand

	Capacity by traders to absorb demand					
	Absorb demand 25%		Absorb demand 50%		Absorb demand 100%	
	Yes	No	Yes	No	Yes	No
Retailer	60.0%	40.0%	33.3%	66.7%	18.2%	81.8%
Wholesaler	57.1%	42.9%	28.6%	71.4%	23.8%	76.2%
Collector	80.0%	20.0%		100.0%		100.0%

Source: Traders' survey in Sierra Leone, 2013

The analysis by most important commodities shows that wholesalers and retailers might have difficulties to meet a potential increase in local rice demand by 25% (

Table 7). In this particular case, there is no significant risk for an inflationary effect on the markets, should the local rice demand increases by 25%, since consumers could switch to imported rice, which is available all year long. Traditionally, the rice production in Sierra is not enough to meet the annual per capita consumption of rice (104 kg/person/year). However, traders might have the capacity to absorb 25% increase in demand in imported rice and cassava. Although 100% of the wholesalers are able to respond to the increase in the vegetable oil demand by 25%, overall retailers are the ones in the commercial chain who might have problems to meet the gap.

Table 7: Response capacity to increase of demand by 25% and by commodity

Capacity of traders to absorb demand (by commodity)			
		Absorb demand 25%	
Commodity	**Traders**	**Yes**	**No**
Rice(local)	Retailer	40.0%	60.0%
	Wholesaler	33.3%	66.7%
Rice(imported)	Retailer	61.9%	38.1%
	Wholesaler	55.6%	44.4%
Cassava	Retailer	100.0%	0.0%
	Wholesaler	66.7%	33.3%
Vegetable oil	Retailer	0.0%	100.0%
	Wholesaler	100.0%	0.0%

Source: Traders' survey in Sierra Leone, 2013

An increase in demand by 25% would likely result into an increase of commodity prices the coming six months even though all the interviewed wholesalers claimed their ability to adequately respond in case of a potential demand increase in imported rice, cassava and vegetable oil. More than 80% of traders believe that there would be a temporarily change, thus the risk of price inflation appears to be low (Table 9). However, this allegation needs to be watched carefully while implementing a cash and voucher activity. In general, similar proportions of retailers and wholesalers expect increase prices to be sustained the coming six months.

Table 8: Estimated price development

Estimated price development next 6 months by typology of traders if demand increases by 25%			
	No change	**Decrease**	**Increase**
Retailer	29%	19%	52%
Wholesaler	37%	21 %	42%

Source: Traders' survey in Sierra Leone, 2013

Table 9: Price increase lasting

	Price increase lasting	
	Temporary	**Sustained**
Retailer	81.8%	18.2%
Wholesaler	82.4%	17.6%

Source: Traders' survey in Sierra Leone, 2013

8. Conclusions and Suggestions

The objective of the assessment was to gauge the market functioning and the feasibility of a market based programme intervention such as cash or voucher transfers in the realm of food assistance.

Findings of the assessments can be summarized as follows:

➢ With a widespread poverty, which leaves people financially unable to acquire sufficient food, Sierra Leone is prone to high prevalence of food.

➢ An inflation remaining steadily above 10% requires attention and cautious monitoring. However, with rice being the main staple and its prices being relatively stable a cash and voucher programming could be considered.

➢ Evidence from the traders' survey suggests fairly collusion market behaviour, as prices are determined in mutual agreement between traders.

➢ Further, regardless of structural challenges, traders appear to be confident and able to respond to a reasonable increase in demand.

➢ Traders with structured accountability are difficult to find among retailers in either urban or rural markets, as the majority of Western African retailers are doing business informally. Therefore, a cash and voucher programme should require at least a license of doing business.

➢ While the business climate has improved since the end of the war and infrastructures through foreign direct investment is increasing, it can be assumed that, in general, the market environment in Sierra Leone is conducive for implementing cash or voucher operations.

However, the assessment team would raise caution on potential risks:

- An significant scale-up could exceed the capacities of traders;
- Inflationary trends could be reinforced by significant cash transfers.

It is advised that any cash or voucher activity should be carefully monitored to avoid any deviance in retail prices and further negatively impacts food access.

Markets and contexts may change over the course of an action, therefore an appropriate monitoring system that collect and analyze realistic amounts of data and provide information to the cash and voucher programme will be needed. Such information may help to identify criteria where a change in transfer modality (cash or voucher) may have to be considered.

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