STRUCTURE, CONDUCT AND PERFORMANCE OF COMMODITY MARKETS IN SOUTH SUDAN: Linkages Food Security

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Acronyms and Abbreviations

CAR	Central African Republic
CBOS	Central Bank of Sudan
CLIMIS	Crop and Livestock Market Monitoring System
CPA	Comprehensive Peace Agreement
DRC	Democratic Republic of Congo
FAO	Food and Agricultural Organization of the United Nation
FEWS NET	Food Early Warning Systems Network
GOSS	Government of South Sudan
IDPs	Internally Displaced Persons
MAF	Ministry of Agriculture and Forestry
MIS	Market Information System
SP	Sudan Pound
SS	South Sudan
Ush	Uganda Shilling

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Executive Summary

Several factor highlight food market risks and uncertainties for urban consumers in South Sudan. First, the South Sudan's agriculture is yet to revive appreciably from severe disruptions caused by over two decades of civil conflicts. Secondly, rural and urban areas are poorly integrated, mainly due to a virtual absence of transport and communication infrastructures, as well as due to civil insecurities. As a result, major urban markets are heavily dependent on imports of most basic food staples. The major supply sources are North Sudan and Uganda. Khartoum and Kosti are the major centers of procurement transactions of North-South Sudan trade, while Kampala is the major centre of cross-border transaction of commodities flowing from Uganda. Together, North Sudan and Uganda account for the bulk of sugar, maize flour, rice, onion, wheat flour and sorghum sold in the four markets. This heavy dependence on importation of food supplies implies that any adverse events, both market and non-market, on the North-South Sudan, and/or the Kampala-South Sudan trade flows increases the vulnerability of a large percentage of urban households

In order to focus its activities on promoting the provision of up to-date information on food supply prospects and their implication on food security, the FEWS NET South Sudan office has identified the need for an effective market monitoring system. This report is intended to contribute towards a better understanding of South Sudan's agricultural commodity market systems. The focus is on structure, conduct and performance of agricultural marketing systems in four major urban markets, namely Juba, Rumbek, Wau, and Malakal. Major marketing channels and market participants are characterized through a rapid diagnostic survey involving semi-structured questionnaires and informal interviews of key informants, as well as direct observation of market transactions.

The findings show that North-South Sudan and Kampala-South Sudan trade are characterized by three distinct marketing channels. One involves large-scale traders who move large volumes storable food commodities —mainly grain cereal; grain legumes; maize and wheat flour; and sugar— using large capacity hired trucks. Goods from Khartoum are also moved by barges down river Nile. Another channel involves small-scale traders, who individually face quantity constraints in hiring entire trucks, but who are able to pool together to share transport trucks. The third channel involves transporter-trader, i.e., truck-owners combining transportation, buying and reselling functions. This third channel is common with bulky perishable commodities, especially bananas, onion and potatoes. Internal commodity sources are also important in supplying the urban markets. However, they are still disadvantaged by relatively poorer road transport infrastructures, which pose major operational problems.

The structure of supply in the four markets is closely linked to the structure and constraints of transportation. Because the trunk roads connecting the four urban markets with major supply sources are impassable during rainy seasons, commodity procurement by road tends to be concentrated in the dry season. In contrast, water transportation tends to be concentrated in the rainy season when the river's water volume is adequate to allow barge movement. Malakal and Juba, which are well-positioned for river transportation

during the rainy season, do not simultaneously have access to road and water transportation. Therefore, do not present alternative modes.

The markets are concentrated. Certain infrastructural constraints have made this inevitable; the long distance haul on roads that become impassable in the rainy seasons necessitates the operation of large businesses for better management of procurement schedules. Concentration, however, underlines the importance of an effective and quick information system to provide up to date information to traders so that they can quickly respond when adjustments are required. It is essential that the traders should get timely information about impending problems, the alternatives and possible solutions. This way they can benefit the consumer markets more and sustain their businesses better.

Trader face numerous and varied challenges. The challenges range from infrastructural weaknesses that create uncertainties to traders' ability to supply the market and distribute the commodities effectively. Long distances of movement, poor road infrastructure, civil insecurity and multiple formal and informal taxes are the major limiting factors.

The study concludes that the observed marketing system relates to food security through availing food supplies to the urban markets, as well as enhancing market participant's access to food through job creation and income growth. Performance of these two food security dimensions depend on a number of factors, including traders' level of access to commodity transportation services; the condition of transport and communication infrastructure (transportation links); availability of storage; transaction costs; marketing risks due to civil insecurity (may be too risky for individual private entrepreneurs); and cost of protecting the commodities. These are broad aspects of the market that should be monitored.

It is also recommend that efforts to establish effective monitoring systems should involve the active engagement of the newly established MIU in MAF for internal capacity-building and sustainability.

1.0 Introduction

The influence of aggregate food supply on market prices and, hence, on food access is well-recognized. Food supply and price levels have traditionally been the dominant indicators of food access. However, lessons derived from experiences in developing countries suggest the need to broaden this view of the influence of market on food security. The need to incorporate other market-related aspects is becoming increasingly clear. Observations show that food access problems experienced in most parts of developing countries are only partially attributable to levels of aggregate food supplies and prices. Rather, food access problems are also caused by inefficiencies of marketing systems. It is not uncommon for the countries to have localized food surpluses and low prices, while other parts suffer food deficits. It is also common for periods of food surpluses to be followed by transitory food insecurities. Such situations suggest that a more broad-based view of marketing mechanisms is crucial in identifying critical marketing-related food-access-impediments. They also suggest the need to incorporate additional market-related indicators for use in monitoring for food security. Furthermore, the experiences imply that the indicators should be defined within a specific context.

This report is the outcome of a study commissioned by the Famine Early Warning Systems Network (FEWS NET). Its overall goal is to contribute towards a better understanding of South Sudan's agricultural commodity market systems. It is based on the structure-conduct-performance (S-C-P) model of market analysis. The choice of the model reflects a shift from FEWS NET's traditional focus on only one aspect of food security— the household's food access. The *FEWS NET Market Guidance No2* of May 2008, notes that the combined effects of structure, conduct, and performance (S-C-P) of a marketing system have significant consequences for a country's or region's food security. Accordingly, the Guidance recommends the use of the S-C-P model in order to better contribute to food early warning analysis. This report focuses on food marketing systems in four urban markets of South Sudan (SS), namely Juba; Rumbek; Wau; and Malakal**.** The aim is to enhance the understanding of market structure, conduct and performance of major food commodities in the four markets. Its expected outcome is a market monitoring plan for food security analysis for use in early warning for the four urban areas. In summary, the study's terms of reference are to: (1) confirm the selection of commodities most relevant to food security (2) identify and characterize a set of key market networks for food, cash crops and livestock (3) characterize market structure and conduct as well as indicators to be used in monitoring for food security analysis purposes (4) identify North-South Sudan and other cross border market linkages (5) give implications of market performance on food security. The detailed terms of reference are given in Annex1.

The rest of the report is organized as follows: sub-section 0 explores conceptual linkages between market performance and food security; Section 2.0 presents the background and context of the study; Section 3.0 focuses on describing the method used; Section 4.0 presents the study's findings; Sub-section 5.0 presents summary of findings; while 6.0 present a proposal of monitoring plan

Conceptual Background: Causal Linkages between Market Performance and Food Security

An efficient food marketing system is a crucial component in enhancing food security. The functioning of food markets has significant influence on all dimensions of food security, which include food availability, accessibility, and utilization. The causal linkages between marketing and food security are complex. A number of the linkages operate through the influence of the marketing system on production incentives. Production beyond a farm household's consumption needs is heavily dependent on market access. The extra costs and risks of investing heavily in labor, capital, and productivity-enhancing technologies are justifiable only if output markets are ensured. Hence, one consequence of poor market access is that farm households have little incentives to fully exploit their land and labor potentials and are, therefore, constrained to subsistence farming of a few basic staples. This, in turn, limits a country's or region's capacity to ensure that all of its people have sufficient physical and economic access to food. Conversely, an effective food outlet access contributes positively by facilitating a more profitable utilization of labour and land potentials. The resultant higher returns lead to enhanced cash-earning capacity and a wider food commodity base. Increased rural-households' buying capacities, in turn, provides the necessary monetary support for rural commerce. At the same time, crucial linkages of agriculture to non-farm sectors, both in the rural and urban areas, are created and enhanced. The income generated, coupled with change in demand as income rise, provides essential drive for increased investment in high-value agricultural commodities and products, as well as potential to expand the geographical market scope to include regional and international markets. All this has far reaching consequences for the development of investments, job opportunities outside agriculture, diversified livelihoods and, hence, on enhancement of food security.

Other linkages operate through operational and pricing efficiencies of the marketing system. These relate to how satisfactory the movement of food is, from supply sources to the consumer. The effectiveness of food supply chains can influence food security in various ways. Food availability may be influenced through physical food losses and wastages at various marketing channel levels. Accessibility may be influenced through operations that increase the share of consumer food cost that is accounted for by marketing cost. Such operations include multiple handling as units of products are built into larger or subdivided into smaller lots, in processes entailing lengthy marketing channels and, hence, high marketing costs. Accessibility may also be influenced through market structures that allow extraction of monopoly profits, rent-seeking, as well as price sensitivities that favour market middlemen but that are disadvantageous to consumers and producers. Middlemen-biased price sensitivities mean that when supply and or market cost pressures pushes costs up, the increase is rapidly passed on to consumer. Conversely, when food demand pressures drive consumer prices up, the price increases are not rapidly passed down to producers. Inadequate or lack of appropriate storage facilities may constrain the system's capacity to hold stock from peak supply periods in correspondence to even demand requirements through crop production cycles. Such storage constraints are often manifested in large seasonal price variations, and hence, instabilities in aggregate food supplies. Wide seasonal price variations may also be the result of poor market information

on market supply and demand condition, and hence, prices. Poor market information and transportation system may fragment the market causing wide spatial price variations

What all this suggests is that a good food security monitoring plan requires to be designed in such a way as to capture the varied aspects of the food marketing chain that influence food security. These include the systems abilities to: offer sufficient incentives for farm households to produce marketable surpluses; distribute food from surplus to deficit area; stockpile in periods of plenty for redistribution in periods of scarcity; collect and disseminate market information.

2.0 Background information

In early 2000s South Sudan (SS) emerged from an armed conflict that had prolonged for over two decades. The end of the armed struggle was signalled by signing of the Comprehensive Peace Agreement (CPA) in January 2005. This signified the beginning of a new era in the development of (SS). During the years of conflict, agricultural production was disrupted, while formal markets became few, isolated, and small mainly due to politically restricted population movements, non-exist market infrastructure, and lack of a common currency, and of income-earning opportunities. Informal exchange mechanisms, mainly in form of barter trade, dominated.

The signing of the CPA triggered social-economic changes. Since then, large populations of South Sudanese, who during the years of conflict lived as refugees in neighbouring countries, have returned. At the same time, large numbers of internally displaced people (IDPs) have resettled in areas that were inaccessible during the years of conflict. By the year 2005, the population of South Sudan was estimated to be 9.5 million and was expected to increase to 12 million with the return of remaining refugees. The government of South Sudan (GOSS) has embarked on major efforts to rehabilitate and rebuild social and physical infrastructures destroyed during the protracted years of conflict. In addition, the Central Bank of Sudan (CBOS), in 2007, introduced a common currency—the Sudanese pound (SDG)—thus addressing the transactional problems of dealing with multiple currencies as was the case before. This has been accompanied by the establishment of a number of banks in major urban areas. Peace, in combination with these changes, has facilitated the opening-up of SS to commercial activities, among them trade and agricultural marketing. Rural areas are slowly becoming linked with urban markets, especially for sale of livestock, groundnut, sorghum, sesame, millet and a variety of fresh fruits and vegetables. However, prices fluctuate heavily. This is mainly because roads linking urban markets with food commodity supply sources become impassable during the rainy season leading to shortages of commodities. Meanwhile, barter trade is still common in rural areas.

As economic activities in SS continue to increase and diversify, there is need to develop an agricultural market monitoring system that can provide regular information on prevailing supply and demand conditions, as well as information on concerns and issues hindering effective operations of the markets. Apart from informing early warning, the provision of

such information has the potential to contribute significantly towards identification of serious barriers to efficient marketing, as well as in identification of new technologies or institutional arrangements appropriate in enhancing market performance. This is crucial as the government of South Sudan (GOSS) strives to transform the area's agriculture into a more market-oriented operation. Indeed, the development of market-oriented domestic agriculture presents SS with a strategy for improved food security through: increased and diversified food supplies; increased rural employment and income-generating activities; and, production of exportable surpluses.

Significant market opportunities for locally produced agricultural commodities exist both within SS and in the neighboring countries. South Sudan's geographical position—bordering Kenya, Uganda, the Democratic Republic of Congo (DRC), the Central African Republic (CAR), and Ethiopia — combined with its abundant natural resources, suitable agro-ecological conditions, and rich biodiversity, creates strong potential for market integration of its agricultural sector with East, Central, and Northern Africa, as well as the rest of the world. Currently substantial amounts of sugar, rice, maize flour and wheat flour consumed in major urban areas of SS is sourced from Uganda and Northern Sudan. Addressing technical and socioeconomic constraints to local agricultural production, and to urban market access, presents major market opportunities for rural South Sudan as locally grown commodities substitute for those sourced outside. In the medium term, there are prospects for increased local supply of a variety of horticultural commodities and rice, especially with full implementation of four national irrigation schemes. Rejat, Kabo, and Jabel Lado horticultural Schemes, estimated to be 43,000; 25,000; and 20,000 acres, respectively, are under way for the production of tomatoes, cabbages, okra, and water melons, while Aweil rice Scheme, which is about 11,000 acres, is expected to increase local supply of rice.

The crucial role of market-oriented agriculture and, hence, an efficient agricultural marketing system, is also apparent from the pivotal role that agricultural growth must play in driving overall economic growth of SS. Like is the case for many other developing countries, GOSS has identified agricultural growth as a major route to overall economic development. The *Food and Agricultural Policy Framework* prepared by the Ministry of Agriculture and Forestry (MAF) in 2007 notes that growth in the agricultural sector has the potential to have an impact on peoples' livelihoods and the economy's prosperity. The framework has set a strategy of transforming agriculture and forestry services into a driving force of the economy in achieving a number of objectives, among them: (1) to achieve food security; (2) promote poverty reduction; and (3) contribute to GDP. As part of these objectives is the desire to produce marketable surpluses to serve local, regional and international markets. These objectives can be realized only in conjunction with an efficient marketing system.

2.1 Context of the study

A workshop organised by the Ministry of Agriculture and Forestry (MAF) in collaboration with the Food and Agricultural Organisation of United Nation (FAO), in December 2007 to

discuss the way forward in establishing a crop and livestock market monitoring system (CLIMIS), noted that collection and sharing of market data in SS is faced with a lot of challenges. These include uneven data collection, lack of a framework for a coordinated and unified data collection, and non-existence of a national market information system. The workshop highlighted the following as the most critical elements in establishing the monitoring system:

- Determination of the markets or commodities to monitor
- Identifying the key market structure and conduct that require monitoring.
- The workshop proposed that as a first step toward establishment of CLIMIS, these two aspects need to be well understood.

It is also worth noting that the MAF has recently established a Market Information Unit (MIU) with priority being to collect price information. The price-collection activity was already in place at the time of this study in four states namely Central Equatoria, Lakes, Upper Nile and Western Bahr el Gazal where the four markets of Juba, Rumbek, Malakal and Wau, respectively, are located. The Unit is, however, handicapped in a number of ways. First, it is constrained by lack of an effective and instantaneous information and communication system. This hampers implementation of a centralized approach to co-ordination, analysis and dissemination of market information. Yet, rapid communication is essential if price information is to be relevant. Secondly, the unit is understaffed and lacks capacity to monitor prices regularly, perform analysis and disseminate relevant market information on a regular basis.

2.2 Geographical scope of the study

Administratively, SS is divided into ten states (see **Error! Reference source not found.**) as listed below:

Central Equatoria

Eastern Equatoria

Jonglei

Lakes

Northern Bahr el Gazal

Unity

Upper Nile

Warab

Western Bahr el Gazal

Western Equatoria

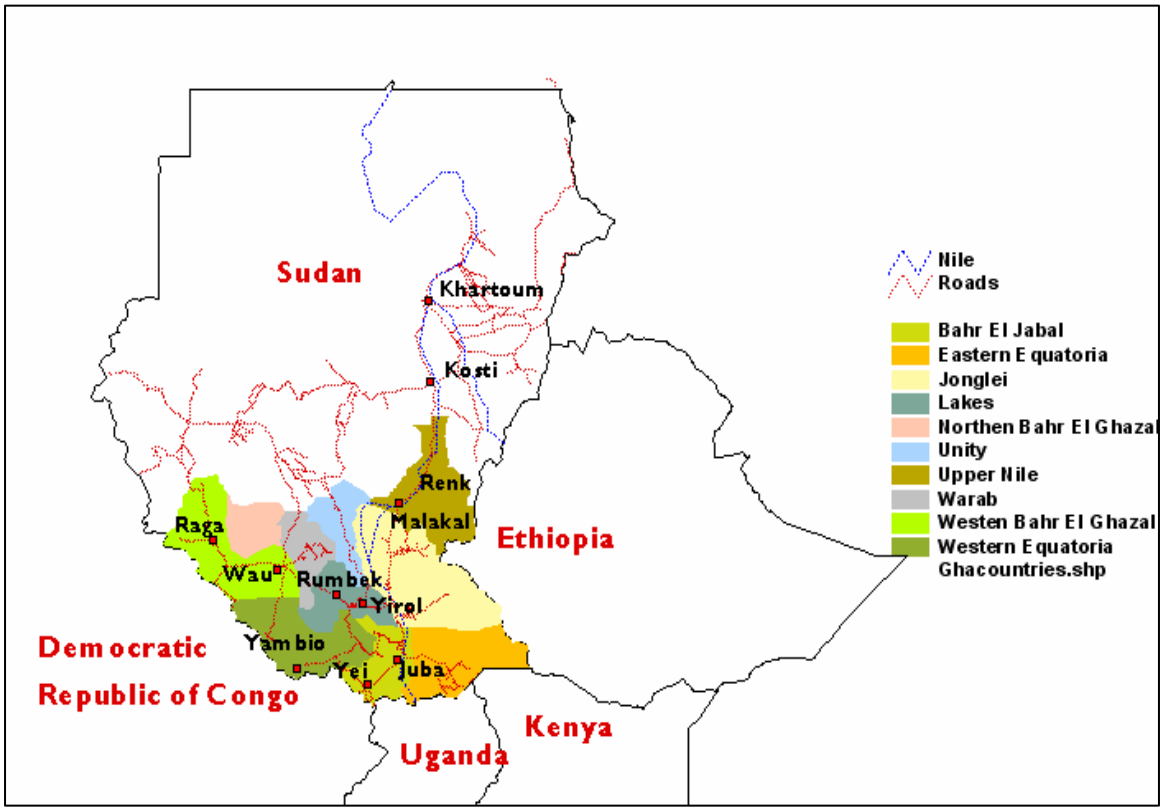

Figure 1 A Map of South Sudan showing the respective position of the markets covered in the study

Each of the State has its own administrative and commercial urban centre. The study covers the administrative and commercial centres for Central Equatoia, Lakes, Western Bahr el Gazal, and Upper Nile. These are Juba, Rumbek, Wau, and Malakal, respectively. Juba is also the administrative and commercial capital of SS.

3.0 Methods

The study was conducted in the July, 2008. A rapid diagnostic survey method using semi-structured questionnaires and informal interviews of key informants, as well as direct observation of market transactions was used. The choice these study tools was based on:

The expansiveness of the area of study;

The exploratory nature of the study with respect to identifying commodities that are; relevant to food security and that should be included in a market monitoring;

The virtual absence of reliable sets of statistics on volumes of cross-border trade and of the number of traders involved, and their volumes of sale;

The short time available to conduct the study;

The logistical problems posed by high cost of movement; and
The need to produce quick, reliable results given the available time and resources.

Because of lack of statistics on the number of traders and on their distribution by type, the choice was made to use a two-stage purposive method to select a study sample. First, the main physical locations of food commodity markets were identified with the assistance of officers of MAF. The market places are well-designated under the authority of the Local Government. Table 1 provides lists of market places selected in each of the four urban centers.

Table 1. Major market centers covered in the study

Urban Market	*Market centers covered*
Juba	Konyo konyo, Jebel
Rumbek	Rumbek main market (Amarat), Malieth
Wau	Suk Hajar, Jahu
Malakal	El Saha

The traders engaged in marketing agricultural commodities were identified and selected for inclusion in the sample using the following criteria: The trader dealt in agricultural commodities; he or she was willing to cooperate; and, he or she had sufficient time to provide the required data. To assure good quality and detailed data collection, the cooperation of the trader interviewed was deemed more important than the total number of traders interviewed. The aim was to interview several participants at each important market center, as well as to observe marketing processes and activities. Table 2 shows the sample composition. A total of 102 traders were interviewed, of which 65% per cent were retailers and 35% were wholesalers.

Table 2. Sample and composition

	Juba	Rumbek	Wau	Malakal	All
Number of traders interviewed	31	18	25	28	102
Trader category					
Retailers	21	11	16	18	66
Wholesalers	10	7	8	10	36

The decision to base the study mainly on data collected from traders was based on the fact that South Sudan's urban agricultural marketing is re-emerging at a time when the role of the private sector, in coordination of food commodity markets, is increasing. This has given a unique opportunity for the GOSS to concentrate on providing support infrastructure and services, while leaving the actual performance of marketing functions to the private sector.

4.0 Findings of the Study

To gain insight into how the marketing systems operational in the four market centers influences food security, a number of market aspects that were conceptualized to contribute in determining the context of the markets as well as having significant consequences for performance of the markets were examined. The results are presented in 9 sub-sections. Sub-section 4.1 profiles the traders based a selected socio-economic variables; Sub-section 4.2 presents the food commodities commonly sold in the markets studied and their major supply sources; Sub-section 4.3 discusses the structure of transportation and storage; Sub-section 4.4 discusses the marketing channels, as well as the role of major market participants in the moving the goods from supply source areas; Sub-section 4.5 presents the systems' concentration based on Lorenz curve and Gini Coefficient; 4.6 discusses market conduct with respect to market information search and pricing; Sub-section 4.7 present s marketing cost s and margin, Sub-section 4.8 discusses market constraints; Sub-section 4.8 and 4.9 discusses the livestock and fish markets, respectively; Sub-section; while Sub-section 5.0 and 6.0 present summary of findings and the proposed monitoring plan, respectively.

4.1 Socio-economic profile of survey respondents

The summary statistics for the sample are presented in Table 3. The interviewees were predominantly male (76%). However, the Juba sub-sample featured a considerably higher (55%) proportion of female. It also featured a considerably higher proportion of non-Sudanese traders with about 53% of the interviewees in the sub-samples being Ugandan nationals. Among the female traders in the sub-sample, 65% were Ugandan nationals. Observations showed that participation of South Sudanese women in agricultural marketing was relatively low; they were mainly active in small-scale trade, mainly involving making and selling food snacks— mostly tea and pastry. The data also suggested a segregation of marketing functions by gender, with 90% of the women in the total sample being engaged in retail as opposed to wholesale trade, which was dominated almost exclusively by men.

Table 3 summary statistics of the traders Socio-economic attributes

	Juba	*Rumbek*	*Wau*	*Malakal*	*All*
Gender and Nationality of trader					
male (%)	45.16	100.00	88	96.43	79.59
female (%)	54.84	0.00	12.00	3.57	20.59
Sudanese	48.39	100.00	100.00	100.00	84.31
Uganda	52.61	0.00	0.00	0.00	15.69
Age of trader and number of year in the trade					
Mean age of trader	32.42(12)	35.33(9)	33.53(10)	36.79(10)	34.40(10)
Mean number of years in trade	5(4)	14(11)	89)	16(9)	10(10)
Level of education					
% with no formal education	16.13	50.00	20.00	10.71	21.57
% with primary education	29.03	38.89	40.00	42.86	37.25
% with secondary education	38.72	11.11	40.00	39.29	34.31
% with college education	16.13	0.00	0.00	7.14	6.86
% with regular access to phone	83.87	87.50	50.00	84.19	76.53
Other sources of cash income outside agricultural trade					

None	80.65	27.78	37.5	50	52.48
Farming	9.68	44.44	25	25	23.76
Public service employment	0.00	0.00	4.17	10.71	3.96
Private service employment	3.23	5.56	8.33	0.00	3.96
Others	6.45	22.23	25	14.29	15.84
Ownership of store					
% with own stores fully used for own storage	23.33	22.22	32.00	67.86	37.62
% with own store and renting part of the space out	0.00	5.56	0.00	10.71	3.96
% rented/leased in store	63.33	72.22	48.00	14.29	47.52
% not applicable	10.00	0.00	20.00	7.14	9.90

The traders' level of education was generally low, with over 50% having either no formal education or primary level education. Traders in Juba were relatively better educated, with over 50% having secondary or college level education. Overall, the traders' access to telephone was good, with exception of Wau where only half of the interviewed traders stated that they had regular access to telephone. Overall 70% of the traders indicated that they had regular access to telephone. The growing advancement in telecommunication technologies has offered the traders with better means of communication. At the time of the study, SS had three mobile telephone service providers, with each of the four urban towns covered in the study being served by at least two providers. It was not clear why fewer traders had access to phone in Wau.

The results suggest that the traders had some linkages to farming, but that the importance of this varies across the urban markets. About 9 out of 20 traders in Rumbek derive some income from farming. By comparison, about 1 in every 4 traders in Wau and Malakal earn some income from agriculture, but only 1 in 10 in Juba. The low number trader-farmer in Juba is attributable to the higher number of non-Sudanese traders in the market. As already shown, about half of the traders in Juba are Uganda Nationals and may not own land in SS.

The results suggest that use of rented-in storage space was common. Over 50% of the total number of traders used rented-in storage spaces. About 37% of the total number of trader owned stores that they used for solely their own business, without renting out any space. There are also indications that co-sharing of store space among several traders is practiced.

Figure 2 shows the sample distribution by number of years of experience in trade. The figure is presented in two panels. Panel (a) presents mean years of trade experience for the total sample. Panel (b) presents a comparison of trade experience across the four markets. The figure shows that, overall, the traders have been in trade for an average of 10 years. It also suggests that the four markets have different business-age distributions. About 70% of the traders interviewed in Juba have been in business for only 1 to 3 years. About 60% of those interviewed in Wau have been in business for only 1 to 5 years. Conversely, over 50% of those interviewed in Rumbek and Malakal have been in business for over 10years. This is attributable to differential is relative stability of the urban centres in the last 10years.

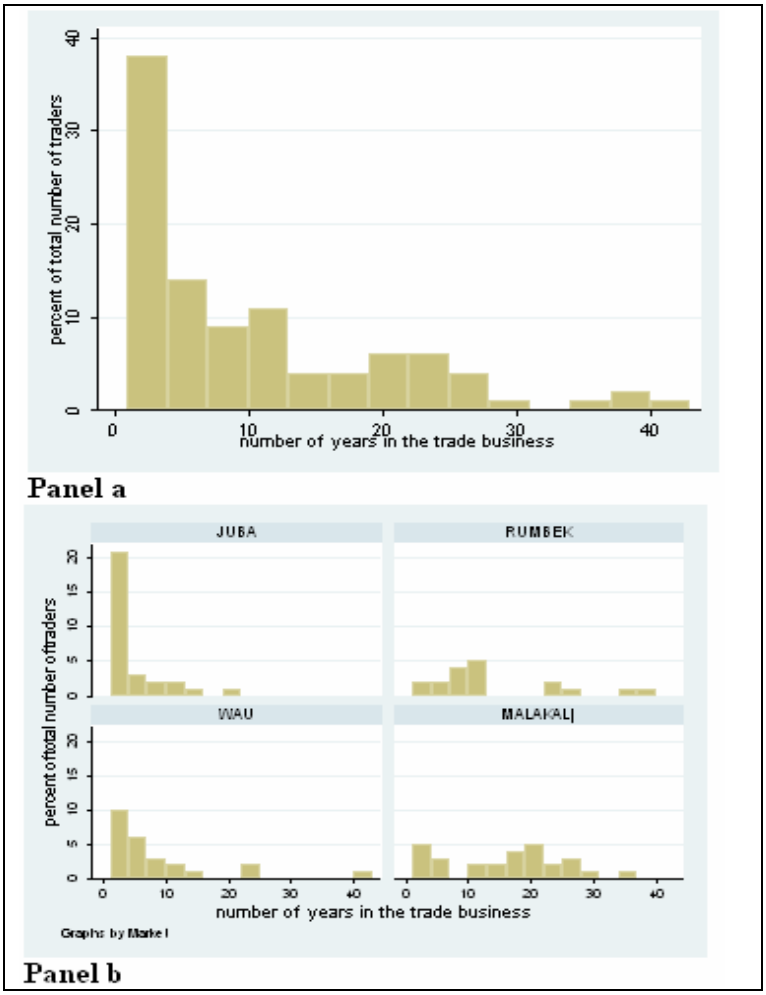

Figure 2. Sample distribution by number of years experience in trade.

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The profile reveals certain aspects of the systems strengths, weakness, and opportunities. It suggests that the businesses are still in their early experiential stages. It is therefore expected that as the traders gain from experience, the systems' performance will improve. However, the traders' level of formal education is generally low and may work as a limitation depending on how attractive the system becomes, as it grows, to potential entrants with higher levels of education.

4.2 Commodities and Sources of Supplies

South Sudan is still struggling with the challenges of reviving an agricultural sector severely disrupted by over two decades of civil conflicts. With the exception of groundnuts, cassava, livestock, fish and a variety of fresh vegetables, the four urban markets are heavily dependent on imports of most of other basic food staples. The respondents generally identified Kampala and Khartoum as their major sources of supply, with no major seasonal shifts. Table 4 presents a list of major food commodities sourced outside SS and their major supply source markets.

Table 4 Major commodities traded in the markets and their major origins

	Kampala	*Khartoum*
Sorghum		√
Maize and maize meal	√	
Rice	√	√
Wheat and wheat four	√	√
Sugar	√	√
Groundnut	√	√
milk (powder)		√
Dates		√
Vegetable oils (mainly groundnut)	√	
Vegetables	√ (mainly tomatoes, irish and sweet potatoes, bananas)	mostly tomatoes and onion
Eggs	√	

Khartoum and Kampala are the major centers of procurement transactions. Together, supply procurements from Khartoum and Kampala account for the bulk of sugar, maize flour, rice, onion, wheat flour and sorghum sold in the four markets. In addition, Juba sources bananas, irish potatoes, common beans, dried coffee beans, and eggs from Kampala. Wau and Malakal are mainly dependent on Khartoum for sorghum, sugar and maize flour. This flow of goods to SS from Kampala and Khartoum is part of a large volume of informal cross-border trade among African countries, which though not captured by official statistics is well recognized for its scale; implication on food security and households livelihoods; and, impacts on rural development (see Awour (2007); Minde and Nakhumwa (1997); USAID 1996; 1997; 1998a; 1998b).

Supplies from local production are also important for a number of commodities including groundnuts, cassava, livestock, fish, and a variety of fresh vegetables. Table 5 summarizes commodity flows from local production. The first column lists the four urban markets, while the second lists commodities sourced locally by each of the market. The last seven columns show the major local sources of the commodities. Thus, for example, sorghum flows to Wau from W. Bahr, and also from El Ghazal. The table suggests that there is a substantial difference, among the four urban markets, not only in the diversity of commodities supplied from local production, but also in supply source areas. The results indicate that Wau receives a relatively more diversified commodity flow of commodities from local production.

Table 5. Major commodities flowing into the four urban markets from local production

Market	Commodity	Local supply sources area						
		W. Bahr El Ghazal	N.Bahr El Ghazal	Lakes	Warab	W. Equatoria	Upper Nile	C. Equatoria
Wau	Sorghum	√	√					
	Millet	√	√					
	Cassava	√	√					
	Groundnut	√	√	√				
	Sesame	√	√		√			
	Wheat	√						
	Honey					√		
	Fresh Okra; water melon; hibiscus	√						
	Bananas; pumpkin; fish; live cattle, goats, & sheep							
Malakal	Sorghum; tomatoes; fresh okra; lentils,; egg plant; fish live cattle, goats, & sheep						√	
Rumbek	Groundnut, live cattle, goats, & sheep			√				
Juba	Live cattle, goats & sheep							√
	Groundnut, cassava, groundnuts			√				

4.3 The structure of transportation and storage

In view of the poor state of transport and communication infrastructures linking the four urban centers with food commodity supply sources, transportation and storage are crucial in determining the centers' abilities to minimize variability in food access. Observation showed that the structure of food commodity supply in the four centres is, indeed, closely linked to the structure and constraints of transportation. Because the trunk roads connecting the four urban markets with major supply sources are impassable during rainy seasons, commodity procurement by road tends to be concentrated in the dry season. On the other hand, water transportation tends to be concentrated in the rainy season, when the river's water volume is adequate to allow barge movement. Therefore, even for Malakal and Juba, which are well-positioned for river transportation, road and water transportation are not simultaneously available and, therefore, do not present strict alternative modes. Rather, the availability of the two mode, for Malakal and Juba, imply a relatively more evened out food procurement schedule. However, traders explained that road transportation is the preferred mode since river transportation entails a lot of handling and associated transaction costs. Besides the transportation-related concentration of procurement, the entire procurement process (including searching, assembling and transportation) involve high time costs per trip, running to as high as 20days.

Combined, the concentrated procurement and the high time cost per procurement trip place heavy demands on the trade for storage functions. Although the relative participation in performing storage functions varies across traders, an integral role of the trade is to ensure a continuous business flow across the dry and rainy seasons. Storage and efficient storage management are, therefore, critical components of the traders marketing strategy. Storage and efficient storage management are essential for the trader in avoiding being in an "out of stock situation" in the rainy season or between supply deliveries. It also means that the efficiency of storage and storage management have great implications on market price movements, as well as the convenience and timeliness of the urban food market supplies. However, despite the implied importance of storage, the types of storage observed in the four markets were small rooms measuring between 10 x 10 and 30 x 30f, which also doubled as the sales area

Table 6 average duration stock is held in store by retailers and wholesaler

Storage duration (time)	Retail (%) (n=66)	Wholesaler (%) (n=36)
<=1week	35.94	1.82
>1week<=2week	28.13	3.64
<2week<=3week	6.25	3.64
>3week<=1month	7.81	16.36
>1month<=2month	10.94	29.09
>2month<=3month	6.25	40.00
>3month	4.69	5.45

Table 6 shows a marked difference between retailers and wholesalers in the length of storage. The vast majority (64%) of the retailer hold storable commodities for only up to 2

weeks. A vast majority (69%) of the wholesalers hold stock for up to 3 months. This means high financial costs associated with costly storage.

4.4 Organization of Marketing

As already noted, the operating marketing system is virtually in the hands of the private sector, with trade being driven by individual private trader's desire to seek business opportunities. The results suggested that the typical agricultural-commodity-based business operational in the study area comprises family businesses, where only one, two or three family members are actively involved. Schematic representations of the marketing channels characterizing commodity market flows to the four markets are presented below. Figure 3 depicts physical flows of moving commodities from Khartoum and Kampala.

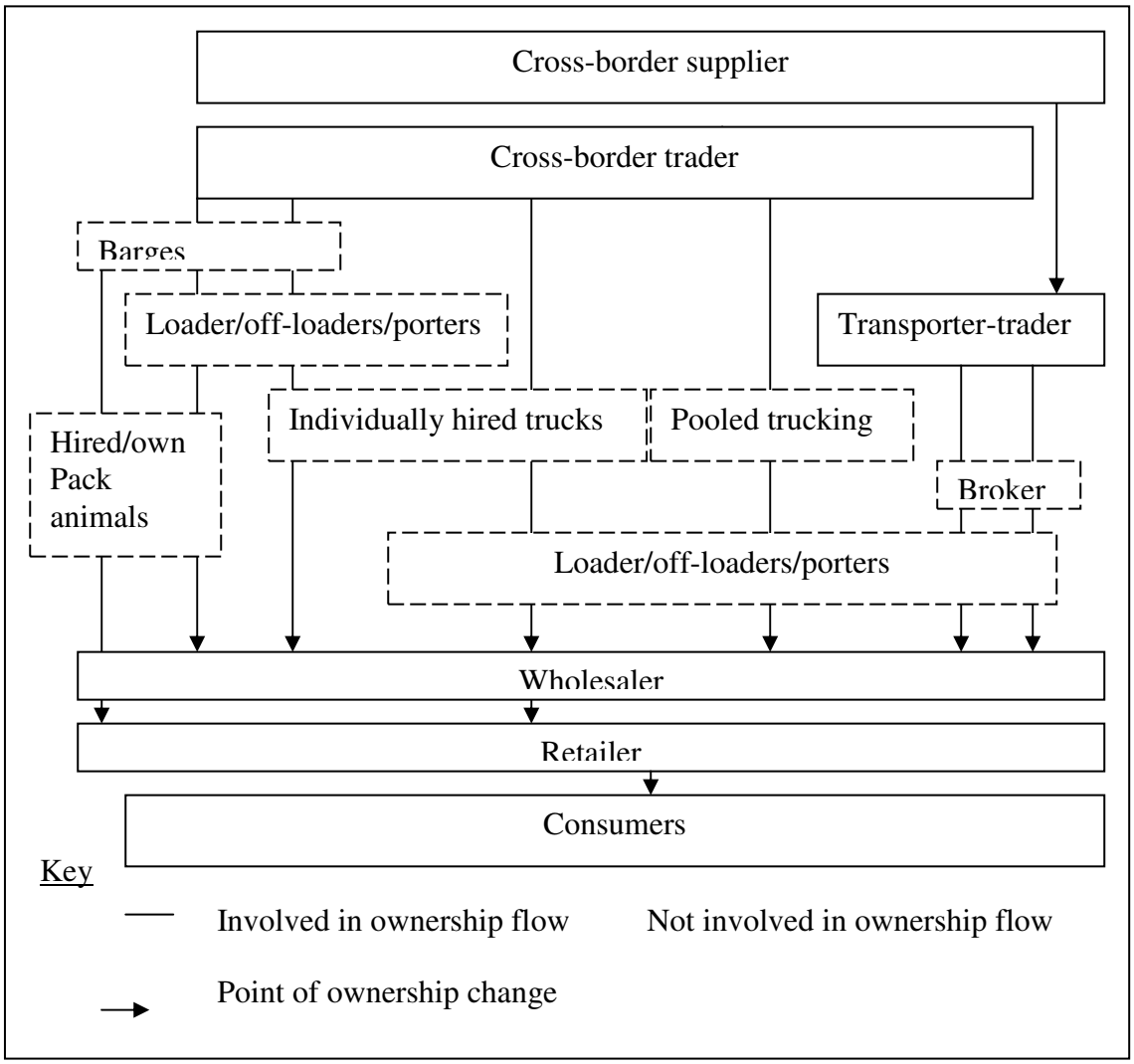

Figure 3. Marketing Channel for Agricultural commodities flowing from Khartoum and Kampala sources

Figure 4 depicts physical flows of moving commodities from local production areas. In each of the figures, participants involved in commodity ownership flow are enclosed in line rectangles, while those not involved are enclosed in dashed line rectangles. The arrow-heads indicate the points at which commodities change hands and, thus, traces the commodity's ownership flow.

It must be noted that the functional separation implied by the different channel levels does not necessarily signify separation of persons performing the functions. In most cases the same person moves with the commodity along the different channel levels, performing the distinct functions entailed. This may be attributed to the fact that the operating system does not allow absentee buying; a trader cannot order and await delivery at the resale end. Traders, themselves, physically travel across the border to make procurement and transportation arrangements. It must also be noted that the relative importance of brokers vary with commodity. The rest of this section discusses major marketing function and the conduct of the market participants involved in the flow.

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depicts physical flows of moving commodities from local production in SS.

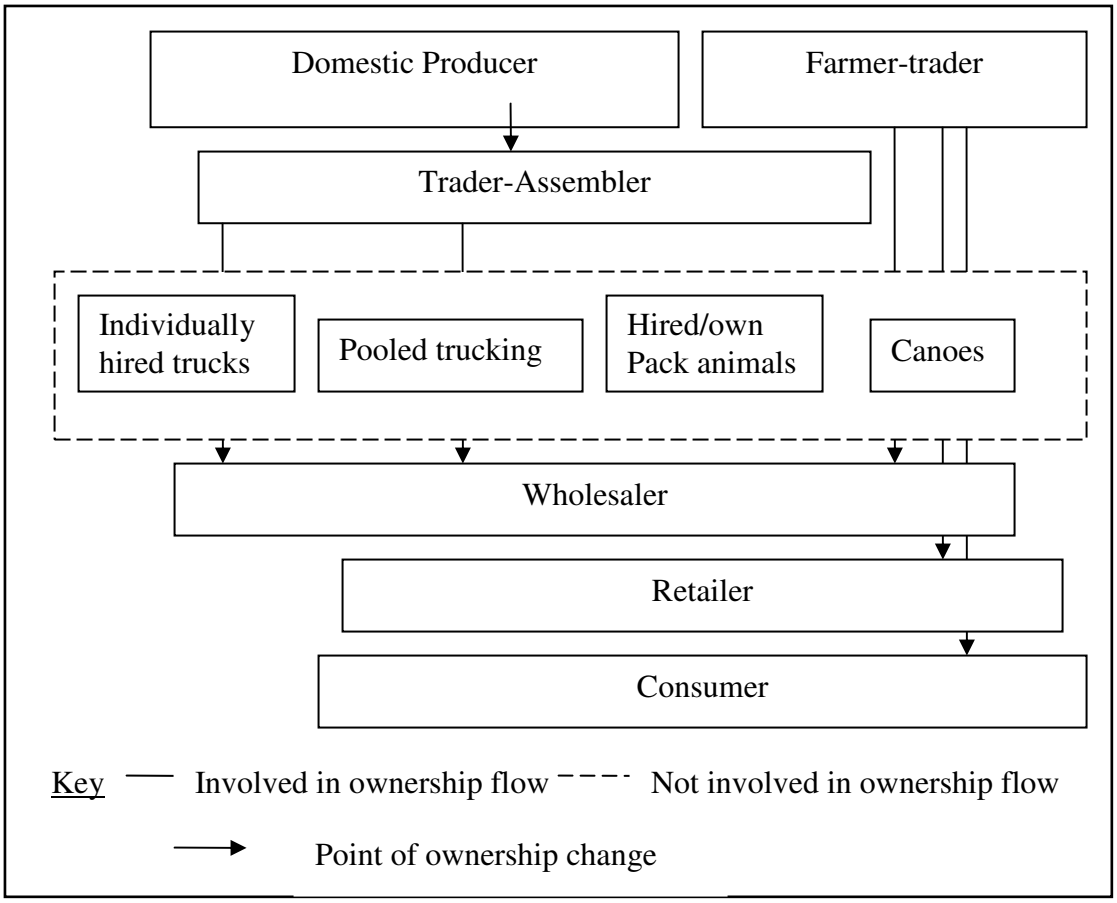

Figure 4. Marketing Channel for Agricultural commodities flowing from domestic production

In each of the figures, participants involved in commodity ownership flow are enclosed in line rectangles, while those not involved are enclosed in dashed line rectangles. The arrow-heads indicate the points at which commodities change hands and, thus, traces the commodity's ownership flow.

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4.4.1 Cross-border traders

The cross-border trader plays a very critical role in facilitating regular, year-round supply of major commodities and products sourced in the neighbouring countries. The main transaction costs aspects of exchanges entailed at this level include searching, assembling, purchasing, and moving goods to the respective urban markets in SS. Searching and assembling extends beyond assembly markets in capital cities of source countries and reaches out into major production areas. For instance, traders sourcing commodities from Uganda go as far as Jinja and Mbarara in Eastern and Western Uganda, respectively, while those sourcing from Northern Sudan seek commodities from farms around Kosti.

4.4.2 Domestic producers

Internal commodity sources are also an important component of the trade currently observed in SS. Regional differences in internal commodity flows are, however, apparent. As already shown in Table 5, survey results showed that Juba receives supplies of cassava, sorghum and groundnut from the Lakes State. Rumbek, which is the administrative and commercial city of the Lakes State, receives the three commodities from within the State. Of the four urban markets, Wau, which is the administrative and commercial city of Western Bahr El Ghazal, featured a more diversified commodity flow from internal source, followed by Malakal. Trader-farmers supplying Wau market from within the state commonly use bicycles and pack-animals to transport commodities to the market. Trader-farmers supplying Malakal market commonly use pack animal and canoes.

4.4.3 Transportation

As already mentioned, a substantial volume of the physical flow of food commodities destined for the four urban markets starts mainly from Kampala and Khartoum, while a smaller, but growing volume, comes from local production. Goods from Uganda are mainly transported by road while those from North Sudan are transported by barges down the River Nile, and/or by road. Road transportation is mainly organized in three different ways. These are:

- Individually hired trucks
- Collectively shared trucks
- Transporter-trader trucks

4.4.3.1 Transportation from local production sources

The local sources of supply are still disadvantaged by relatively poorer roads. This poses operational problems. Except for parts of Upper Nile where sorghum is grown in relatively larger scales, sourcing of sorghum, groundnuts and sesame from local production involve assembling of small quantities from many different farmers at the farm-gate. Because of absence of rural access roads, this is done using bicycles over narrow paths. The commodity trader travels to the production area and spends about two to three days organizing and supervising the assembling activities. The activities involve collection and movement of commodity from the numerous small-scale farms to central collection points

that are accessible by motorized vehicles. When the desired loads have been assembled, they are transported to the urban market using independently or co-jointly hired trucks.

4.4.3.2 Road Transportation from Kampala and Khartoum

Large-scale wholesalers commonly individually hire large-capacity trucks ranging from 8 to 50 metric tons. The large capacity trucks are particularly important in large-scale traders' stock management as well as in minimization of transaction costs. Because of the long distance of haul, large-scale traders commonly procure large volumes of commodities per procurement trip as a way of minimizing transactions costs.

In contrast, individual small-scale cross-border traders procure small volumes of commodities, ranging from a few bags to an average of 15 tons, per procurement trip. These individual quantities are far below the capacities of the transportation trucks that can profitably move goods from the distant source markets. To form economical loads for transportation by the trucks, and thus overcome their individual small quantity constraints, small-scale traders pool their loads. The other category, transporter-trader, consists of truck owners participating in trade. This is common with bulky perishable commodities, especially bananas, onion, and potatoes. Transporter-traders commonly buy perishable bulky commodities from sources areas to resell off-their-trucks at the urban markets.

Another distinction can be made between cross-border and internal truck-based transportation. The distinction is especially more pronounced in Malakal and Juba because of the huge volume of transportation business of moving commodities from the river-side barge terminals. Commodity handling from the river port terminals, both in Juba and Malakal, is well-organized. Movement of goods from the respective river-side terminal is under the control of a Rivers Trader Union, which is essentially a union of truck drivers and owner-drivers. The object of the union is to ensure orderly traffic flow from the river terminal to commodity resale points. Its role is generally one of administration and supervision. In its administration role, it allocates trucks to traders requiring trucking services. It also sets and reviews the trucking charges. When a need to review the charges is felt, the union deliberates and proposes new rates to the Ministry of Commerce for approval. The charges do not vary with season. Rather, they are fixed pan-seasonal. In its supervisory role it ensures that traders do not transact transportation service directly with truck owners or truck drivers. Instead, the trader has to seek services from the union. It also ensures that only trucks driven by drivers who are members of the union operate trucking business from the river terminal. Essentially, a truck owner has two options; to recruit a driver through the union or hire a driver and have him registered with the union.

Because roads become impassable during rainy seasons, road-based procurement activities tend to be concentrated in the dry season. On the other hand, water-transportation based procurement tends to be concentrated in the rain season running from May to October with a peak in July and August.

4.4.4 Brokers

Brokers play a relatively little role in sale of less perishable commodities. Their role is more prominent in mediating business between transporter-traders, on one hand, and wholesalers and retailers in the resale markets. As already explained, transporter-traders are mainly involved in the marketing of highly perishable commodities, including bananas, Irish potatoes, onions, and tomatoes. The relative importance of brokers in these commodities is attributable to the perishability and thus urgency with which sale of these commodities must be executed. To minimize spoilage, procurement and transportation must be closely coordinated with supply and demand conditions in the resale markets in order to determine timely market deliveries. On reaching to resale market, the seller must make quick sales. Thus, before embarking on procurement and the long distance of travel, the seller needs to be assured of market. The traders explained that the broker maintains a close information link both with the transporter-trader, on one hand, and wholesalers and retailers of the given commodity. As the goods move from source markets (Uganda and Northern Sudan) the broker monitors the movement of the commodity trucks through cell phones, continually updating the traders on the trucks movement progress. When the truck arrives at the market, the broker mediates sale between the transporter-trader and the prospective buyers, for a fee.

4.1.5 Loaders/off-loaders/Porter

As already explained, the physical market flows to the four markets entail large volumes of food commodities per procurement trip. Shipment by road involves large-capacity trucks ranging from 8 to 50 metric tons. Similarly, river transportation entails large volumes, with one barge handling up to 1800 metric tons of goods per trip. Off-loading the trucks and barges, as well as into-store delivery of the loads is done manually. This demands heavy labor that is provided by porters, locally referred to as *atala (atalin* in plural). The off-loaders/porters are well-organized and have substantial control over off-loading and portage services, as well as substantial bargaining status. They set service fees and organize offloading of all trucks/barges arriving in the markets with goods. The conduct is such that a trader cannot make offloading arrangement independent of the organized porters.

In the case of river transportation, both in Juba and Malakal, the porters are well-organized into Trade Union of Loading and Offloading Workers. To be a porter at the riverside, one must register with the union. The workers are divided into teams, each with a team leader. The porters perform that task of offloading goods from barges, loading the goods onto trucks, and offloading the goods at the traders reselling point. The union sets the service charges. Service fee is paid to the Union, which makes a deduction of 5% which is distributed towards three funds: (i) financing the Union's operations; (ii) contribution to the workers' social fund; and (iii) contribution to retirement benefits for the executive officers.

4.1.6 Wholesaler

Two types of wholesalers are distinguishable.

Those selling off-the-truck

Those with wholesale food stores or stalls in the urban markets. Note that, as explained, the types of stores observed in the four markets were small rooms measuring between 10 x 10 and 30 x 30f, which also doubled as the sales area

Off-the-truck wholesalers mainly comprise national of the cross-border source country. They commonly deal with perishable commodities, mainly bananas; irish potatoes; and; onions. During harvest periods of the respective commodities, they buy from farmers and transport the commodities across the border to the given market in South Sudan. The trucks, loaded with commodities arrive at the market place and are positioned at designated places from where the market traders, including retailers and smaller-size wholesalers a can buy.

4.5 Market concentration

The study uses the Lorenz curve and Gini coefficient to show the market concentration. A Lorenz curve presents a graphical presentation of market concentration with regards to market shares of trade volume. It relates the cumulative percentages of market shares (ordered by sized) to cumulative percentages of traders (ordered by size). The Gini Coefficient gives the index of inequality in the volume of trade across the traders. Although the exploratory nature of the study necessitated the assessment of a wide range of commodities, structure was only assessed for storable major staple foods. Three Lorenz curves and associated Gini coefficients are presented. The first set present the market concentration of a 'composite grain', which is an aggregation of important storable, staple grains. It includes maize and maize meal, sorghum, millet, beans, groundnuts, sesame, rice, and wheat flour. The second present the concentration of sorghum, while the third presents the concentration of maize and maize meal. The total number of traders interviewed are first ordered by size of volume of trade and then divided into deciles, starting with the 10% handling accounting for the lowest 10% of the total volume of trade. A Lorenz curve coinciding with the diagonal line (line of equity would imply equal distribution of the volume of trade. A curve that falls below the line of equity indicates inequality.

The results suggest that grain trade feature very high concentration, i.e., the grain trade is in the hands of relatively few traders. Lorenz curves for all grains, sorghum, and maize meal, respectively, are presented in Figure 5, Figure 6, and Figure 7, respectively. The results show that, overall, the grain market is very concentrated with a Gini Coefficient of 0.7. The largest 11.29 % of traders accounts for 39.06% of grain trade, but the smallest 11.29% accounts for only 0.06%. The trade for sorghum is relative more concentrated with a Gini Coefficient of 0.91. The largest 12.5% account for 70.7%, but the smallest 12.5% account for only 0.11%. The market for maize meal is relative less concentrated with a Gini Coefficient of 4.87, which means that the volume of trade is relatively more equitably distributed among traders.

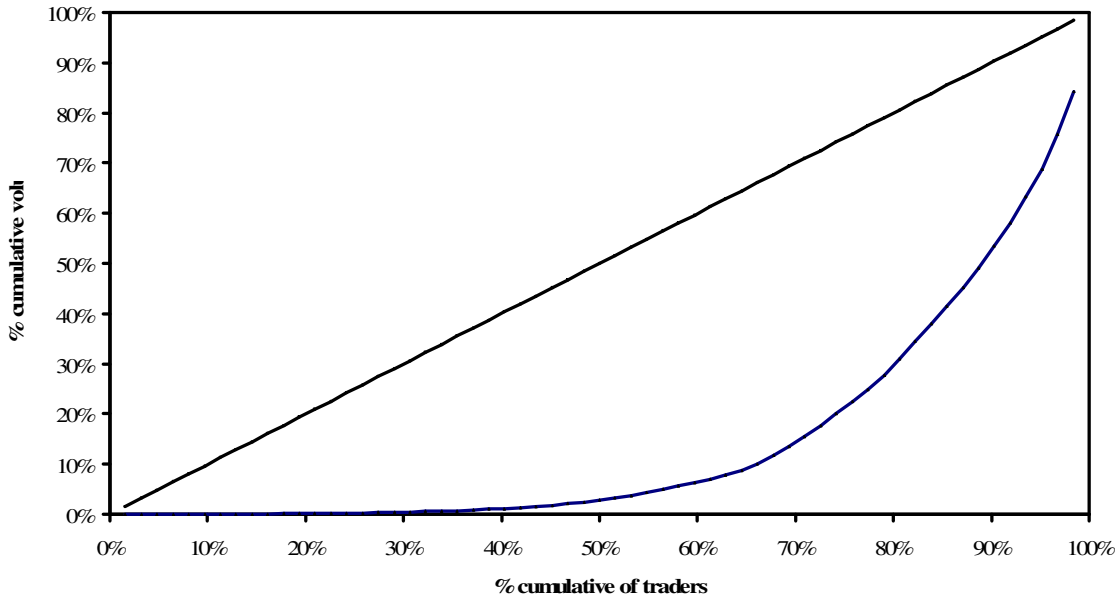

Figure 5. Number and size distribution of grain traders

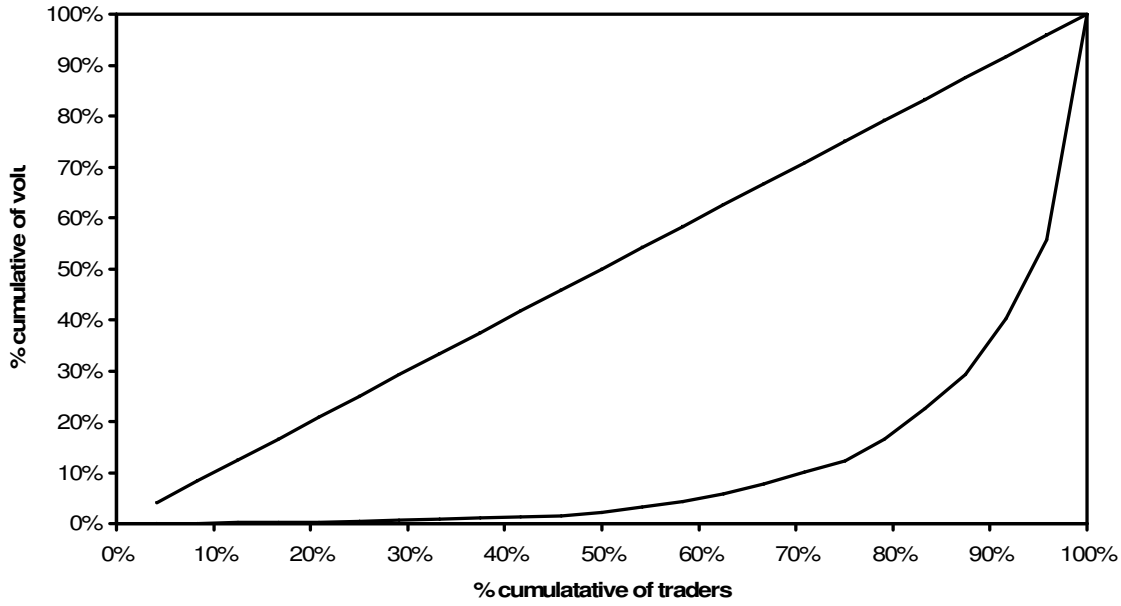

Figure 6. Number and size distribution of sorghum traders

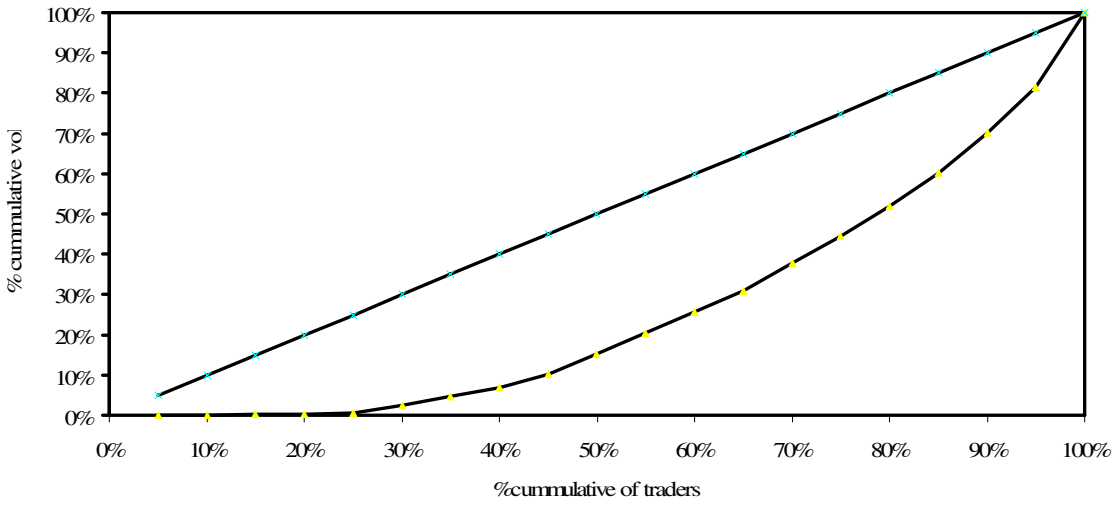

Figure 7. Number and size distribution of maize meal traders

4.6 Conduct of Commodity Procurement and sale

4.6.1 Market Information Search conduct

Table 7 presents the major sources and modes used by the traders when seeking commodity purchase prices. About 76% of the traders stated that they actively seek price information before making purchase decisions. However, in spite of the stated high regular access to telephone (see Table 3), word of mouth is the major means of passing market information, with about 72% of the trader indicating that they receive price information by word-of-mouth.

Table 7 Major means of seeking price information

Mode of and source of price information	*Juba*	*Rumbek*	*Wau*	*Malakal*	*All*
% seeking price before making purchase decision	87.10	72.22	62.50	77.78	76.00
% receiving by cell phone from farmer(s) I know	12.90	0.00	5.00	23.08	11.96
% by cell phone from trader(s) I know	25.81	47.06	44.44	33.19	34.68
% by word of mouth from farmer(s) I know	12.91	5.88	5.56	23.08	12.94
% by word of mouth from trader(s) I know	61.29	52.29	56.44	26.65	59.04

Note: More than one source and mode of seeking price information by some interviewees

Table 8 shows that the use of cell phone is significantly higher among wholesalers (χ^2=14.92; p<0.01) as compared to retailers. This is attributable to the fact that wholesalers' purchase markets are distantly removed from their resale points. It is critical,

before making the long distance purchasing trips, for the wholesalers to seek procurement price information. Information is mainly passed from trader to trader, with 94% of the traders stating that they seek price information from other traders through personal contact either by word-of-mouth (59%) or by cell phone (35%).

Table 8. Traders mode of seeking purchase price information

	Mode and source of price	
	By word of mouth	By cell phone
Wholesalers	72.73	27.27
Retailers	33.33	66.67
All	58.82	41.18

4.6.2 Price Discovery

Informal haggling between seller and buyer is the most widely used method of price discovery, followed by consultations among traders. Table 9 shows that about two-thirds of the interviewees stated that they arrived at selling prices through informal haggling with prospective buyers. There is, however, a marked difference in the selling price conduct between Juba and Malakal, on one hand, and Rumbek and Wau on the other. Over half of the respondents in Rumbek and Wau stated that they arrive at selling prices through active consultation among traders. Those who stated that that they set selling prices through active consultation among traders explained that the consultation involved cost-plus-markup computations fined-tuned by assessment of market situation. Based on these responses, it is evident that there is some extent of collusive pricing conduct in Rumbek and Wau.

Table 9. Price determination methods: negotiation or setting

Market	*Informal Negotiation with buyers*	*Active consultation with other traders in the market*	*From trade association*
Juba	96.77	0	3.23
Rumbek	27.78	55.56	16.67
Wau	41.67	54.17	4.17
Malakal	82.14	14.29	3.17
All	67.33	26.73	5.94

4.7 Market performance

4.7.1 Marketing Costs and Margins

A number of costs items are significant in influencing the prices of food commodities in the four markets studied. Major among these are, transportation, and multiple taxes. Figure

8 presents a schematic diagram showing the components of price build-up from source markets to the wholesale level. The magnitude of the various components of marketing costs, along with their relative shares, is reported in Table 11, Table 12, Table 13, Table 14, and Table 15. The calculations are based on procurement by large-scale wholesalers who use individually hired trucks. The first column in each of the table shows the cost elements reported in the commercial units commonly used in the transactions. The commercial purchase unit for grain cereals, flour, and sugar is either a 50kg or a 90kg bag. However, transportation transactions are based on truck capacities, which are rated in metric ton. The second and third columns show the cost per metric ton in US$ and SDG, respectively.

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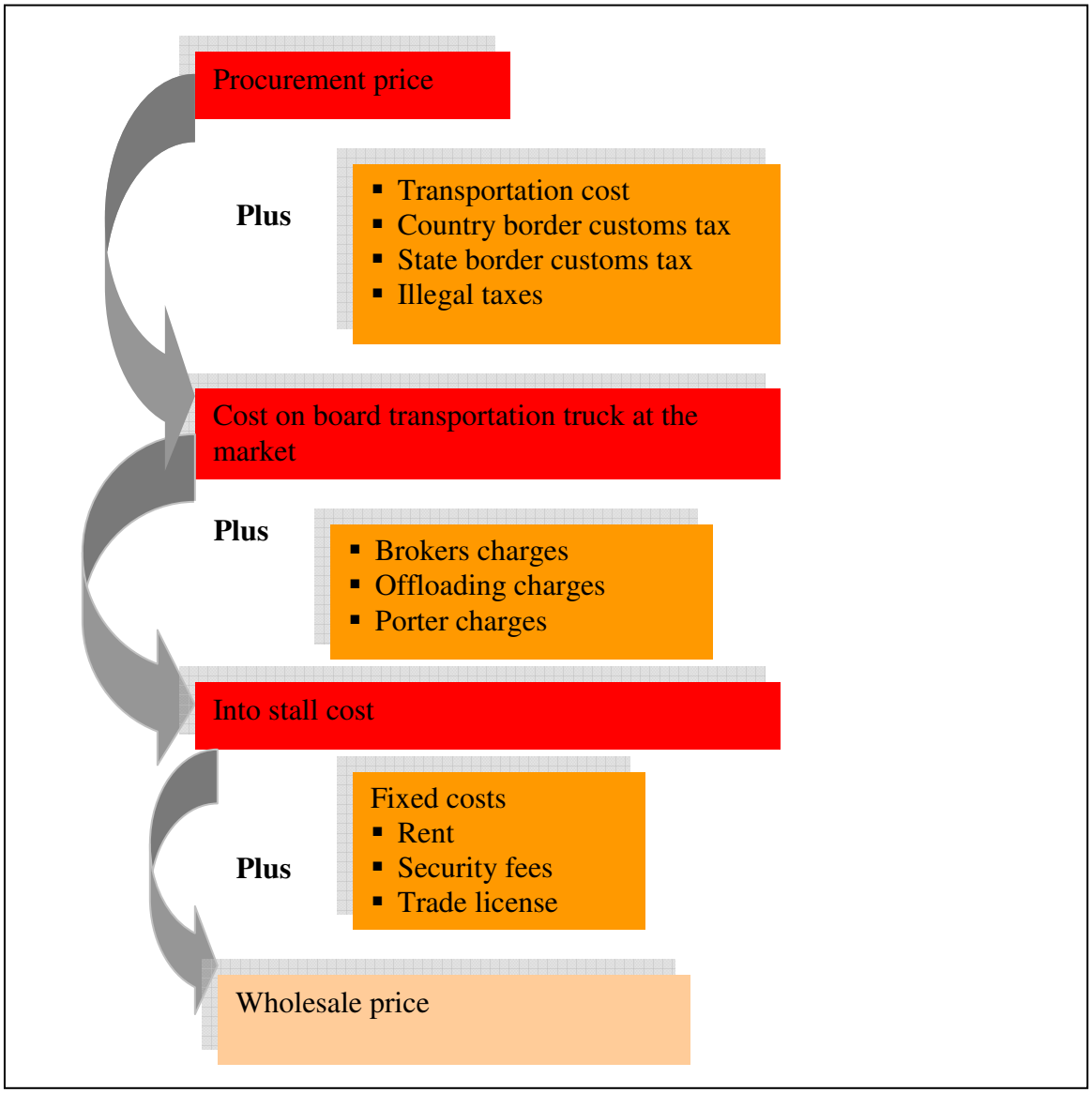

Figure 8 major components of food commodity prices

Transportation cost is by far the most costly component of food marketing in the four markets studied. It accounts for a high percentage of the marketing costs varying from 15% to 50% depending on the commodity. This is attributable to the long distance of haul on poor roads. Further, as has already been explained, procurements schedules are planned to coincide with the dry periods. This translates to a concentrated demand for transportation trucks, which puts pressure on hire rates. Multiple taxes are the next high non-commodity purchase cost. They account for between 5% and 15% percent of the marketing costs. Apart from the monetary marketing costs, the process of commodity procurement and transportation from Uganda and Northern Sudan entail high time costs as shown in Table 10. On average, procurement and transportation processes take 5 days.

Table 10. Typical time costs (in number of days), by road, from Kampala and Khartoum to the respective Urban markets

Source	*Destination by road*			
	Juba	Rumbek	Wau	Malakal
Kampala	4	12	7	NA
Khartoum	3	2	6	7

Table 11 Estimated incidental Costs for procuring a metric Ton maize flour from Kampala and moving it to Rumbek

Cost Element	**US$/ metric ton**	**SDG/ Metric ton**	**% of Total**
Purchase price	437.50	875.00	46.72
Broker @ Ush. 200 per 50Kg bag	2.50	5.00	0.27
Transport cost @Ush. 15million per 15metric ton truck	276.00	552.00	29.47
Custom at Uganda side of the border Ush.15 to 20 million	43.75	87.50	4.67
Custom (Kaya) SDG 3050 per 15 metric ton truck	101.67	203.33	10.86
Custom (Yei) SDG 50-100 per truck	50.00	100.00	5.34
Road blocks costs(6 road blocks)SDG 70-105	5.00	10.00	0.53
Offloading at SDG 2 per 50kg bag	20.00	40.00	2.14
TATAL	936.42	1872.83	
Wholesale price @SDG 70per 50kg bag	1400.00	2800.00	
Wholesaler margin per metric ton	**463.58**		

Table 12 Estimated incidental Costs for procuring a metric Ton Sugar from Kampala and moving it to Rumbek

Cost Element	**US$/**	**SDG/**	**% of**

	Metric ton	Metric ton	Total
Purchase cost @ US$ 39 per 50kg bag	780.00	1560.00	65.37
Transport cost @ Ush.5000 per 20 ton truck	276.00	552.00	23.13
Road blocks costs (6 road blocks @ an average of SDG 25)	3.75	7.50	0.31
Uganda customs @10% of produce cost	78.00	156.00	6.54
Custom at Kaya Border point	35.00	70.00	2.93
Custom at Yei	0.50	1.00	0.04
Offloading at SDG 2 per 50kg bag	20.00	40.00	1.68
TOTAL	1193.25	2386.50	
Wholesale price @ SDG 170per 50kg bag	3400.00	6800.00	
	2206.75	4413.50	

Table 13 Estimated incidental Costs for procuring a metric Ton Sorghum from Khartoum and moving it to Rumbek

Cost element	US$/ Metric ton	SDG/ Metric ton	% of Total
Purchase cost @ SDG 45 per 90kg bag	1000.00	500.00	41.14
Transport cost @ SDG 15000per 25 ton truck	1200.00	600.00	49.37
Road blocks costs	64.00	32.00	2.63
Customs @10% of produce cost	100.00	50.00	4.11
Offloading @SDG 3 per 90kg bag	66.67	33.33	2.74
TOTAL	2430.67	1215.33	
Wholesale price @SDG 170per 90kg bag	944.44	1888.89	

Table 14 Estimated incidental Costs for procuring a metric Ton Wheat Flour from Khartoum and moving it to Rumbek

Cost elements	US$/ Metric ton	SDG/ Metric ton	% of Total
Purchase cost @ SDG 150 per 50kg bag	1500.00	3000.00	75.53%
Transport cost @ SDG 15000per 25 ton truck	300.00	600.00	15.11%
Road blocks costs	16.00	32.00	0.81%
Customs @10% of produce cost	150.00	300.00	7.55%
Offloading at SDG1500 per 25 ton truck	20.00	40.00	1.01%

TOTAL	1986.00	3972.00
Wholesale price @SDG160per 50kg bag	1600.00	3200.00

Table 15. Estimated incidental Costs for procuring a metric Ton Wheat Flour from Khartoum and moving it to Rumbek

sugar from Khartoum	US$/ Metric ton	**SDG/ Metric ton**	**% of Total**
Purchase cost @ SDG 125 per 50kg bag	5000.00	2500.00	73.06%
Transport cost @ SDG 15000per 25 ton truck	1200.00	600.00	17.53%
Road blocks costs	64.00	32.00	0.94%
Customs @10% of produce cost	500.00	250.00	7.31%
Offloading at SDG 2 per 50kg bag	80.00	40.00	1.17%
	6844.00	3422.00	
Wholesale price @SDG 175per 50kg bag	7000.00	3500.00	

4.8 Marketing constraints

The objective of this section is to highlight some of the more critical problems facing the traders and to better understand the relative importance of the problems. To bring out the problems, each respondent was visited individually and asked to list five key factors affecting his or her ability to engage in commodity trade. Next, the trader was asked to rank the five problems, he or she had identified, in order of their significance. The most limiting challenging factor was given a rank of 1. The second limiting was given a rank of 2, and so on. To make a summary comparison based on the problems identified by all respondents, and their respective rankings, the following steps were followed: (1) for each respondent, scores were assigned to the ranks in reverse order. This ensured that, for each respondent, the problems identified were assigned weights in the order of their relative important in affecting the trader's ability to engage in business. Thus, rank1 was assigned a score of 5, rank2 a score of 4 and so on. (2) The scores were then used to compute weighted summary indices, thus giving quantitative indications of the relative importance of problems identified. Figure 10, Figure 11, Figure 12 and Figure 12 present weighted summary measure on a scale of 0 to 5. For each of the markets, the Y-axis is sorted by order of relative importance of the constraints. Thus, insecurity was rated highest in Juba and Malakal, while poor road infrastructure and poor access to credit were rated highest in Rumbek and Wau, respectively.

The figures suggest that the challenges facing the traders are varied and numerous; they range from infrastructural weaknesses that create uncertainties to their ability to supply the market and distribute the commodities effectively. The results suggest that, on the overall, the traders' ability to participate in agricultural commodity trade has been mainly

constrained by poor road infrastructure, civil insecurity, long distance of movement, and multiple taxes.

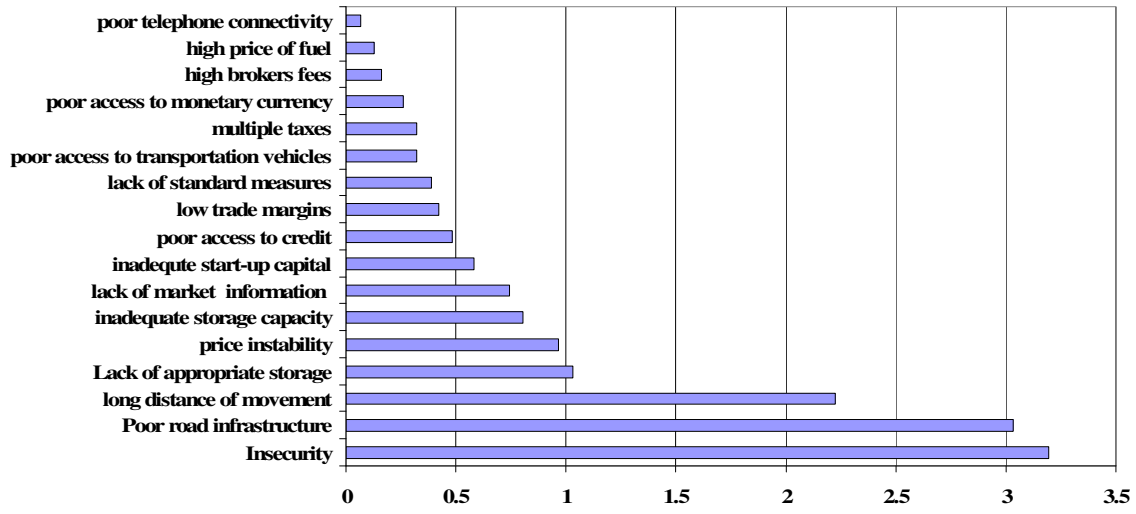

Figure 9 Summary of the of relative marketing constraints faced by traders serving Juba market

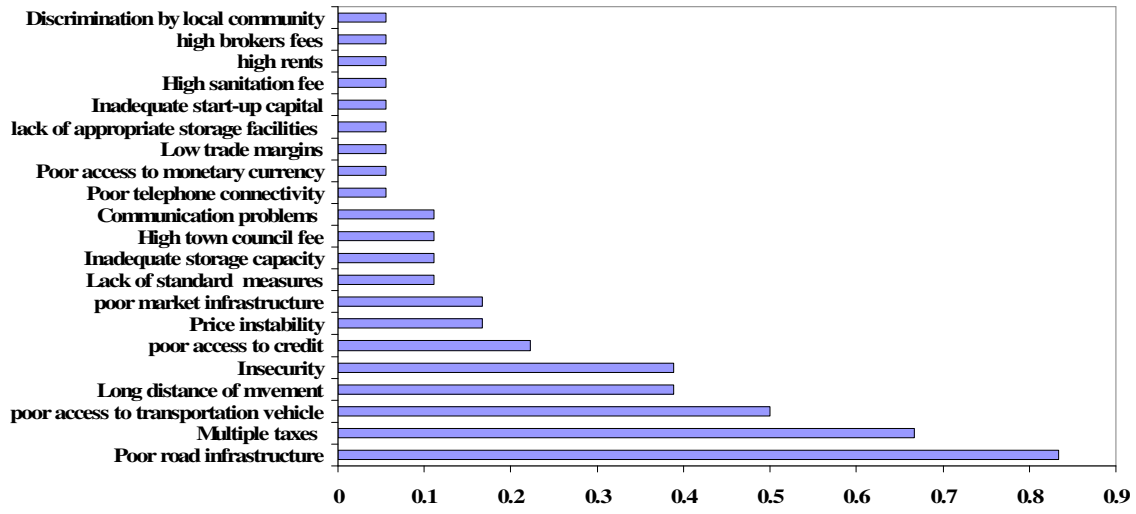

Figure 10 Summary of the of relative marketing constraints faced by traders serving Rumbek market

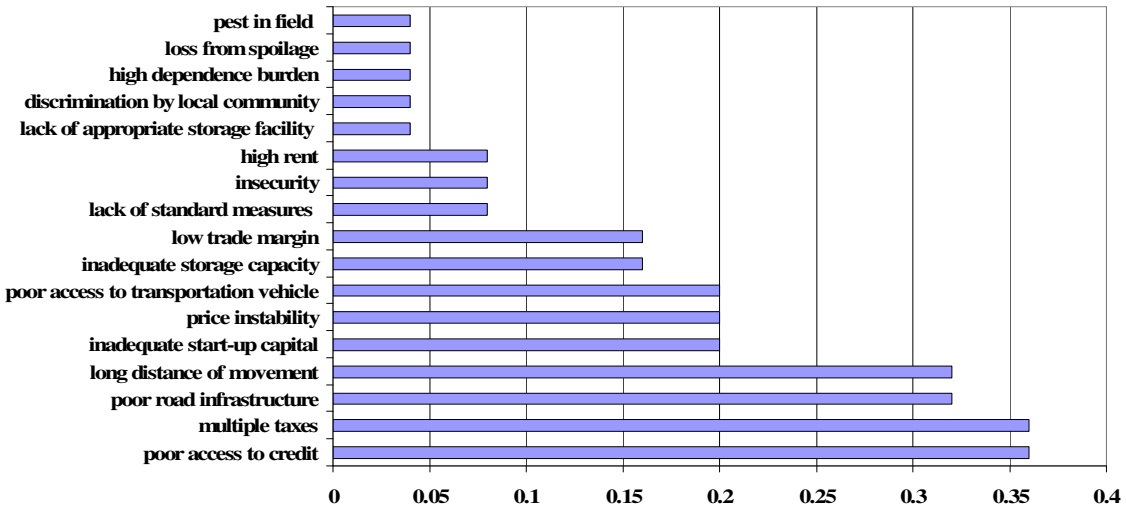

Figure 11 Summary of the of relative marketing constraints faced by traders serving Wau market

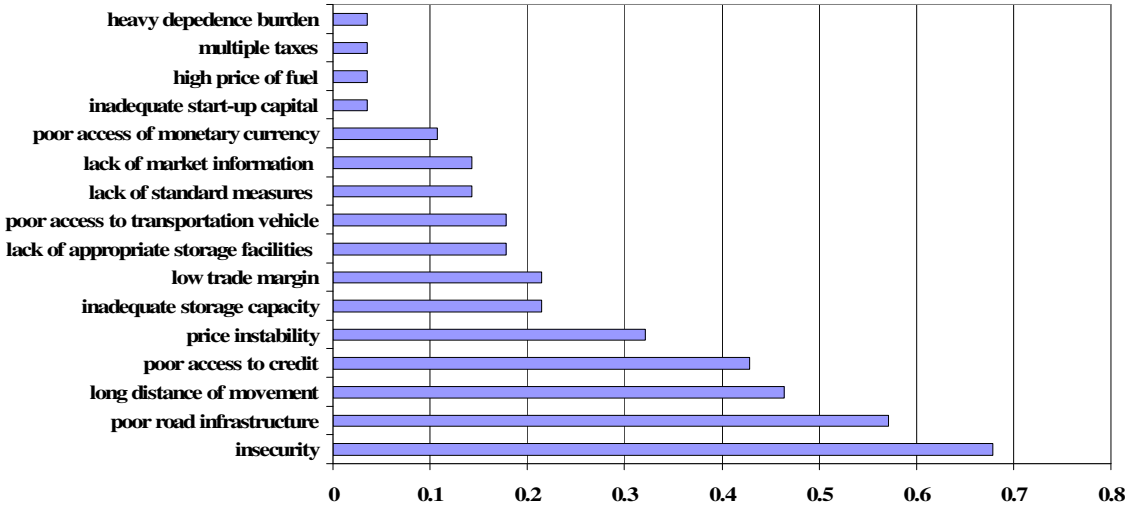

Figure 12 Summary of the of relative marketing constraints faced by traders serving Malakal market

4.9 Livestock Markets

South Sudan is self-sufficient in meat. With the exception of the Greater Equatoria, which is heavily infested with tse tse fly, the rest of the country is well adapted to livestock production including cattle, goats and sheep. However, the livestock is the indigenous type which, have low milk yields. The urban markets depend mainly on imported powdered milk. Livestock production is an integral part of livelihood among rural communities in Lakes, Western Bahr El Ghazal, and Upper Nile. Production of cattle, goats and sheep in these areas supports well-institutionalized livestock markets in Rumbek, Wau and Malakal,

respectively. The physical flows of livestock to the three markets share a number of similarities and are characterized by the schematic marketing channel shown in Figure 13. Certain inter-State differences are also apparent in the flows. In all the three markets, the markets operate daily. The Malakal market has two sales scheduled per day, one from 8 to 10am and the other from 4 to 6pm. Rumbek and Wau markets have one scheduled each from 4 to 6pm, and 2 to 6pm, respectively.

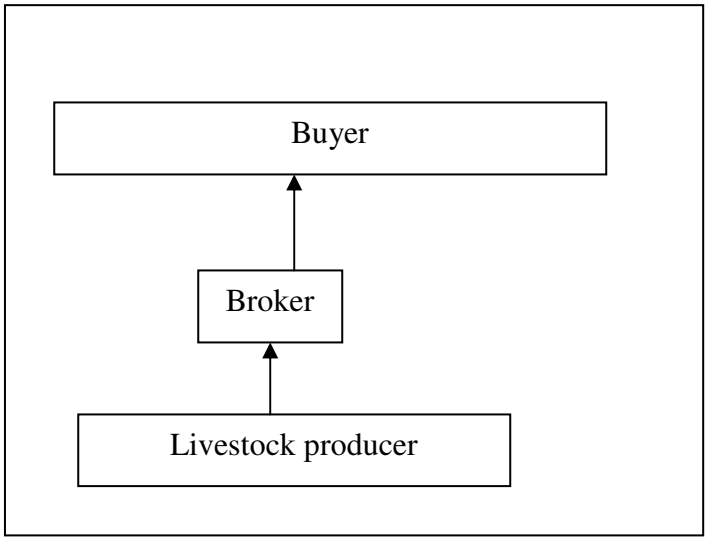

Figure 13. Physical flow of livestock through the marketing channel

The markets are principally served by pastoralists and agro-pastoralists and as is typical of pastoralist communities elsewhere, livestock occupy a key position for the communities. For the pastoralists, livestock play a major role not only in food security, but also in providing economic security in difficulty times, as well as contributing to the household's social status. The study revealed that sales are made only on consensus of family members. Major reasons leading to sale include: need to raise money to buy consumer items (including food), pay medical bills, finance weddings, or to pay fines against crimes committed by a family member. Among these reasons, the need to raise money for household food rates high. For each state, the need is more pressing at a certain time of the year —commonly referred to as the "hunger" season. Table 16 presents the hunger season for the respective States, as indicated by the respondents. For Lakes, the period runs from May to August, while for Western Bahr El Ghazal it runs from June to October, and for Upper Nile it runs from July to September.

Table 16. Hunger season for the respective markets

	J	F	M	A	M	J	J	A	S	O	N	D
Rumbek												
Wau												
Malakal												

The study revealed that in normal years, the hunger season for humans runs counter to the hunger season for livestock. The humans' hunger period coincides with planting and early crop-growing period. Although this is the rainy season, the households have exhausted stocks of food from the previous harvest season. Livestock hunger season, on the other hand, comes before the humans' hunger period. It is the dry period between the harvest and planting periods. During this time the animals, mainly cattle, are moved in search of water and pasture, often to places far placed from the market. At the onset of rains (i.e., planting time and early crop-growing period) the animals are moved back. This coincides with the humans' hunger season. Accordingly, the physical flow of animals to the market is structured around these two hunger periods. Sale of cattle peaks in the human hunger period, while that of sheep and goats peak in the livestock hunger period. This is because sheep and goats cannot be moved much in the rain. Respondents in Malakal explained that in periods of heavy amount of rains, the flow of livestock to the market decreases because animals become susceptible to diseases and losses to death can be high. They also noted that veterinary services are poor because there are no roads to allow service providers to access the villages. It was also noted that animal keepers are not constrained to supply the markets in their State of residence. Rather, they supply the markets nearest to them. For instance, during the months of November to May cattle keepers from White Nile, in NS, tend to move southwards in search of water and pasture. During this period they supply Wau market because of its proximity. Wau also receives animals supplies from the States of Northern Bahr El Ghazal and Warab. Keepers in the northern part of Upper Nile usually supply Kosti in NS.

As shown in Table 17, delivery of livestock to the market involves high time costs. Traders trek with animals for long distances. When asked how far they trek, they respond by giving the number of travel days. Suppliers to Rumbek take 1 to 3 days. Those supplying Wau take 3 to 5 days, while those supplying Malakal take 5 to 7 days. Driven by need for cash, each prospective seller starts the journey individually with his animals. Along the way, the number of prospective sellers and the number of animals builds up. Thus, for most of the trek, animals are moved in large herds by many sellers, arriving at the market in groups. This arrangement, though not necessary prearranged, enhances the security of sellers and their stocks. .

Table 17. Travel time taken by seller s supplying the respective markets

Market	*Travel time in number of days*
Rumbek	1-3
Wau	3-5
Malakal	5-7

In both Lakes and Upper Nile, one is required to obtain a livestock movement permits from the relevant County Council. The permits, apart from permitting the movement of animals, also serve as major insurance against the seller being mistaken for a livestock rustler; it serves as proof of ownership of the animals. Respondents in Malakal explained that

livestock approach the town through certain designated entry points at which Town Council Inspectors check to ensure the prospective sellers have movement permits.

In all the three markets, livestock sale is under the administration of the Local Government and the Ministry of Fisheries and Animal Resources. However, the process of price discovery varies from one market to the other. In Rumber and Malakl, prices are discovered through auction. At the auction pen a bell rings to sound attention of display of an animal or a herd of animals. Bidding ensues, until the highest bidder is discovered. This is followed by payment through the mediation of a Guarantor. In the case of Wau, price is discovered through haggling between the prospective seller and the prospective buyer. Payment is, however, mediated in the same way as in the other two markets. In all the cases, the Guarantor, also referred to as witness, is a person appointed by the producers' community. Each major livestock producing ethnic group appoints their own guarantor. He receives the money, deducts customs and other levies, hands the balance to the seller, and issues a receipt to the buyer.

The study revealed that the levies charged vary from one market to the other. In Rumbek, the levy is 5% of the sale value of the animal, a part of which goes to the ministry of Finance, part to the municipal Council, part to paying the workers serving in the market, part to the Guarantor, and part is held as insurance in case a buyer looses his animal after buying. In Wau, the levy SDG 15 per head of cattle, of which SDG 7.5 goes to the Ministry of Finance, SDG 5 to Town Council, and SDG goes towards veterinary services. In Malakal, the seller pays an entry fee of SDG 7 to the Town Council, while the buyer pays SDG 10. Animals remaining unsold at the close of the day's business are taken to a holding ground at a fee.

The major buyers include:

Those buying to start or enlarge their herds;

Those buying to pay dowry;

Those buying to resell in neighboring countries , mainly in Uganda; and

Butchers

4.9.1 Livestock Marketing Constraints

The marketing of livestock in South Sudan is constrained by two main problems:-

.Insecurity en route to market is a major problem facing sellers. Prospective sellers often encounter with bandits who extort money, and on failure of the livestock owners to produce money, they confiscate bulls.

Clashes with crop growers.

In addition, the Malakal market faces a number of problems related to the size of auction yard and its location. The yard is small relative to the number of livestock handled per day, and movement of animals within the yard is difficult. Originally both the auction and

slaughter house, respectively, were location safe distances from the town's other businesses as well as from residential areas. With time, other businesses and residential areas have encroached on them. This has brought the auction and the slaughter house into conflict with surrounding residents over a number of issues. First, accidents involving livestock are on the rise. Secondly, because of the large number of animals received per day, which can go up to 700 heads of cattle, the stench from animal waste has become an increasing source of frustration to the town's residents. This is especially so during the rainy seasons. Removal and disposal of slurry from the slaughter house are also sources of major concern. The slurry dumping-site is situated within the town. Because of lack of proper slurry handling equipment, a trail of slurry spill often accompanies its disposal. The waste disposal problem is also a major source of water contamination. For Malakal, these problems are made worse by a poorly draining soil type.

4.10 Fish markets

Fishing has great potential, for Southern Sudan, as a source of foreign exchange earning, gainful employment, as well as a means of improving nutritional intake of local consumers. However, the contribution of fish to export remains negligible because of lack of appropriate marketing infrastructures. Among the four urban markets studied, fishing activities are mainly concentrated in Malakal, which is located on the bank of the River Nile; Wau also produces fish but in lower amounts. Although fishing and fish marketing activities are currently oriented towards the domestic market, records show that prior to the mid-1980s the Southern Sudan region used to produce and export dry fish mainly to Egypt. Then production and marketing activities were under the control of the government, through the Department of Fisheries.

Under the current liberalized market regime, the activities are in the hands of the private sector. The role of the GOSS is mainly one of facilitating the private activities. In Malakal, the GOSS through the Department of Fisheries is, in corroboration with FAO and World Vision, offering training to the industry participants on a number of aspects including fish processing, handling, preservation, and net-making. The participants are also made aware of fisheries laws and regulations. Already, a number of participants have been taken through a number of processing methods including smoking, sun-drying, salt drying, and frying. Both processed and fresh fish are sold in the markets. Participants operating far from the markets are practising drying and preservation and selling the processed fish in rural farming areas, Malakal, and Juba. Fresh fish caught in nearby areas are sold fresh in Malakal town and other small local towns. Fresh fish is also transported to Khartoum by refrigerated trucks, but lack of cold rooms in barges places a limitation in the exploitation of the market.

The role of GOSS in fisheries extends beyond facilitation of private activities, and includes conservation of fish and their biodiversity. To control fishing activities, the Department of Fisheries has put in place various measures. To participate in commercial fishing activities, one must register with the department at a set fee, and then secure a fishing license. The licence is renewable annually. The same applies to boats to be used in fishing; they must

be registered with the department at a set fee and have a fishing license, which is renewable annually. One must use specified types of fishing nets — especially with respect to minimum mesh size — to prevent taking off small fish. Accordingly, importation of fishing nets is subject to consultation with the department. A closed period running through the rainy season is observed to allow spawning. The Department is also supposed to monitor fishing activities and to inspect all boats sailing the river. However, the department's performance of the desired monitoring functions is constrained by lack of transport.

Interviews with fisherman revealed that there is a marked separation between ownership of fishing gears (including fishing boats) and fishermen. They explained that the cost of fishing boats and accessories is well beyond the means of most common Sudanese (see Table 18) and is a major barrier to participation in the industry. Most of the fishermen use rented boats and fishing gears. Other challenges faced by the fishermen include insecurity and multi-tax and numerous fees. Insecurity imposes a limitation on the expanse of fishing area, with most fishing activities concentrating near major river bank settled areas.

Table 18 cost of fishing boats and accessories

	Size in metres	Cost in SDG
Ready-made fishing net and accessories	NA	900 to 1,000
Plank boats	7	1,000
Canoe	7	3,500
Steel boat	6	8,500
Steel boat	7	9,000
Steel boat	9	11,000
Steel boat	20	18,000
Steel boat	24	21,500
Steel boat	32	27,000

5.0 Summary of Findings

This study has highlighted a number of features that should to be considered in designing the monitoring plan. The Ministry of Agriculture and Fisheries has already invested in efforts to develop a Market Information Unit (MIU). This is clear demonstration that a market monitoring effort is part of the national objectives of GOSS. Therefore, the challenge for the proposed plan lies in the design and implementation of an initiative that would complement and enhance the existing MIU. One broad objective of the proposal should be to support the development of the newly established MIU to attain a level of effective information generation and communication. The appropriate contribution of FEWS NET in this is to facilitate and support the identification and building, in the MIU, capacities that are crucial for sustainability.

Secondly, the study has noted that because of the heavy dependence on cross-border supplies of food commodities, food prices in South Sudan's urban markets are heavily influenced by external forces. Adverse effects in the major source countries have some effect on consumer markets in South Sudan. This suggests that the proposed plan should view South Sudan's market within a broader context. The system evolved should extend its network of information to cover food supply situation not only in South Sudan, but also in Uganda, Northern Sudan, and Kenya. This can be done through partnering with institution involved in food supply monitoring in these countries The system should also monitor non-market conditions including the general economic and political stabilities of these countries. It should also monitor progress in South Sudan's agriculture and progress in rural-to-urban market access improvement. This information can be collected from agricultural extension offices and from the traders.

The results of the socio-economic profile have revealed certain aspects that indicate the systems' strengths. Both the traders and the businesses are generally young, which implies that they are still in their early experiential stages. As the traders learn more through experience, the system is expected to improve in performance. However, the formal educational level of the traders is generally low and may work as a limitation to enhancing the systems' efficiency. Nonetheless, the age of the businesses and their proprietor suggest that the system is still growing and will continue to attract new participants, subject to barriers to entry.

The study has also shown that agricultural commodity markets in South Sudan are concentrated. Certain infrastructural constraints have made this inevitable; long distance hauls on roads that become impassable in the rainy seasons necessitates the operation of large businesses for better management of food procurement schedules. Concentration, however, underlines the importance of effective and quick information system to provide up to date information to traders so that they can quickly respond when adjustments are required. It is essential that the traders should get timely information about impending problems, the alternatives and possible solutions. This way they can benefit the consumer markets more and sustain their businesses better.

There study has also shown that there are remarkable similarities in the marketing channel, as well as in market conduct of all the four markets. This allows for the use of a uniform price monitoring system. Furthermore, most of traders have access to mobile phones, which can be used in transmitting information through short text messages

6.0 Proposal for a monitoring plan

The central objective of the study was to development a food security monitoring plan that includes a list of commodities, markets, monitoring frequency and methods of data collection and transmittal of collected data to central location for processing and analysis. To help place this in proper perspective, this section starts by acknowledging that food insecurity is a multifaceted phenomenon with many root causes including, problems that

hamper food availability, access to food, timely responses to food shortages, nutritional balance, as well as problems that cause biases in intra-house distribution of food and vulnerability to food shortages. Furthermore, food insecurity can be perceived to exist at different levels including the individual, household.

In placing the study within the context of food security, it must be recognized, as Wiebie *et al* (2001) have noted that, at the consumption end markets basically respond to the demands of those with incomes to spend. In this respect, marketing relates to food security through availing food supplies in the market. At the production end, and all through the distribution chains, marketing plays a key role in offering opportunities for job creation and income growth, thus contributing to food security through enhancing participants' access to food. In view of this, any market-based food security monitoring plan must focus its attention on any factors that either impose limitations on, or facilitate the performance of marketing functions. This is because such factors are likely to have significant consequences on food security through influences on food availability, and on the role of the marketing in job creation and income generation.

Availability of food in the four markets crucially depends on a number of factors. Among them, the more important ones are those that relate to the following:

- Traders' level of access to commodity transportation services. i.e., availability of transportation vessel (truck, barges, goods container) available relative trader's requirement.
- The condition of transport and communication infrastructure (transportation links)
- Availability of storage
- Transaction costs
- Marketing risks Civil insecurity (may be too risky for individual private entrepreneurs)
- Cost of protecting the commodities

All these factors play a part in dictating the physical food supply situation in the four urban markets and should comprise part of the crucial elements to be monitored. Monitoring should be done at the peak procurement season, i.e., during the dry season. Information on all the elements should be collected from traders. Traders should be able make an assessment of all the elements. In addition data should be collected from customs offices. The customs office at the border town of Yei and Kosti assesses all goods passing through to South Sudan as part of their duty collection mandate. It is at these borer points where it is easy to collect data on quantities of the commodities passing through. In addition to the factors influencing the physical availability of goods in the markets, assessment of demand conditions should be made. This should involve collection and analysis of price information. The information can be collected at the retail end of the market chain. This can be done at weekly intervals. From the study, the commodities where most efforts should concentrate are sorghum, maize, wheat, groundnuts, common beans, sugar, beef and fish. These are the commodities most important for food security.

The specific elements that need monitoring to capture the above are summarized in Table 19. In addition it is also recommended that efforts to establish effective monitoring systems should involve the active engagement of the newly established MIU in MAF for internal capacity-building and sustainability. The Unit should be involved in the design to foster a sense of ownership.

Table 19. Market structure, Conduct and Performance variables , Implications for food security and monitoring indicators

Major structural variables relevant for food security	Implications for food security monitoring	Variables to be monitored	Indicator	When to monitor
"Young" marketing system	The system is still developing	human capital (change in structure as the system develops)	-Age of trader -formal educational level of trader	Once a year.
Narrow food staple base. Major food staple commodities are ▪ Sorghum ▪ Maize and maize meal ▪ rice ▪ wheat and wheat flour ▪ sugar ▪ Groundnuts ▪ Vegetable oils ▪ Fish ▪ Beef	Disruption in the supply of any of the commodity would have significant implications for food security: decreased market supplies and likely elevated prices.	Supply of each of the commodities	-Volume flows of each of the commodity into each market compared with a flow in last 3-5 years -Prices for each of the commodity compared with a historical average	During the peak procurement period. For both Rumbek amd Wau Throughout the year for both Juba and Malakal
Substantial volumes of foods flows from Kampala and Khartoum (Except for beef and fish)	-Disruption in supply flow from Kampala and Khartoum e.g., by civil disturbance would have significant implications for food security -Poor crop harvest in the supply source area would reduce available supply	Volumes of food commodities flowing into each of the four markets from these major sources	-Volume flows of each of the commodity into each market compared with a historical average -Prices for each of the commodity compared with a historical average	During the peak procurement period. For both Rumbek amd Wau Throughout the year for both Juba and Malakal
A growing flow of	Local food growing	Volumes of food commodities	-Crop growing performance	-crop growing season

Major structural variables relevant for food security	**Implications for food security monitoring**	**Variables to be monitored**	**Indicator**	**When to monitor**
food from local supplies.	conditions have significant implication on food security	flowing into each of the four markets from these major, including W Bahr El Ghazal, N.Bahr El Ghazal, Lakes, Warab, W. Equatoria, Upper Nile, C. Equatoria	-Crop Harvest volumes -livestock body condition, diseases -Livestock volumes flow into market -timeliness of on-set of rains	-During crop the crop harvest period -Throughout the year -during peak livestock sale period.
Few major wholesalers	-Market power and inflexibility in prices	The number of wholesaler in the market	-prices -transaction costs (including Transportation cost, country border customs tax, state border customs tax, illegal taxes. -Marketing margins	Through ?
Transportation-related structural constraints: -long distance of haul -Impassability of roads during the rainy season - low river water volume in dry season (this is relevant for Malakal and Juba)	-Few transporters -Procurement is concentration in the dry season -Storage is I portent in evening market supply -high procurement time cost	-Availability of transport to move commodities from supply sources. -storage capacities -Procurement time cost	-traders' assessment of availability -Traders' assessment of availability of storage space -Time cost in number of days taken in procurement	During the peak procurement period. For both Rumbek amd Wau Throughout the year for both Juba and Malakal

Major structural variables relevant for food security	**Implications for food security monitoring**	**Variables to be monitored**	**Indicator**	**When to monitor**
Organized loaders/off-loaders/porters	-Market power and inflexibility in loading/offloading/portage fees	Loading,/offloading/portage charges	-Actual charges	During peak procurement period

Awour, T. 2007. Review of Trade and Markets Relevant to Food Security in the Great Horn of Africa: A special report by the Famine Early Warning System (FEWS NET)

USAID (1996) Methodologies for Estimating Informal Cross-Border Trade in Eastern and Southern Africa. Sustainable Development Series, Technical Paper No. 29.

USAID (1997) Unrecorded Cross-Border Trade between Kenya and Uganda. Sustainable Development Series, Technical Paper Nos. 58 and 59.

USAID (1998 a) Unrecorded Cross-Border Trade between Tanzania and her Neighbours. Sustainable Development Series, Technical Paper No. 89.

USAID (1998 b) Unrecorded Cross-Border Trade between Malawi and Neighbouring Countries. Sustainable Development Series, Technical Paper No. 90.

USAID, FEWS NET (2008) Structure-Conduct-performance and food security. FEWS NET markets Guidance, No 2

ANNEX II: Terms of Reference

Grain, livestock and fish market structure, conduct and performance study for select markets in Southern Sudan

Objectives:

The main objective is to assess the structure and conduct of key commodity market systems in Southern Sudan. The study will also provide suggestions for an effective market monitoring as well as recommendations on the requirements for setting up a market information systems for Southern Sudan.

Background and Rationale

In Southern Sudan, understanding of markets is very limited due to over 21 years of conflict January 2005. During the conflict years, formal markets were few, isolated, and small mainly due to politically restricted population movements, lack of a common currency and cash income opportunities, and non existent infrastructure. Therefore, informal exchange mechanisms dominated and were mainly in form of batter trade. During the conflict, market data was collected especially during 1995-2002, but was not standardised. Different markets used different currencies and measures etc. very few markets oriented studies were done during this period.

Signature of peace in January 2005 triggered rapid changes. Populations started accessing previously restricted areas and markets. Flow of commodities to Southern Sudan markets increased. Some key old markets have re-established themselves and numerous new ones emerged. In addition, a new common currency has been introduced (January 2006). Still, there is no understanding of how these markets are functioning despite peace being achieved three years ago. At the same time, data collected during crisis years is likely to be of little use in the current context. Thus, the study will help boost an understanding of how the markets have changed since peace was signed.

Meanwhile, collection and sharing of market data remains a huge constraint due to lack of coordination and use of a unified data collection framework, uneven coverage, and more importantly, lack of a national market information system. During a December 2007 Government of Southern Sudan's Ministry of Agriculture (MAF)/FAO led workshop on way forward in establishment of a crop and livestock market monitoring system (CLIMIS), highlighted all the above constraints as affecting market monitoring. Also, the workshop highlighted identification of markets, their structure and conduct and key things or commodities to monitor as some of the most critical essentials towards establishing the monitoring system, and proposed that these would constitute part of phase 1 of CLIMIS establishment, as it would be a platform for improving market data collection, analysis and dissemination mechanisms.

Also, Phase 1of the CLIMIS would prioritize weekly data collection from two markets per State, namely: One State Capital market and one County market, totaling to 20 markets in 10 states. To facilitate monitoring of the 20 markets, understanding how their structure and conduct is critical.

Based on the above, FEWS Net proposes a Grain and livestock market structure, conduct and performance study market study that will provide some of the baseline inputs required for establishment of CLIMIS phase 1. The study will be conducted in **Juba, Rumbek, Wau, and Malakal** markets and prioritize focus on key food commodities such as **sorghum, maize, groundnuts, livestock, and fish or others** depending on the area.

Scope of the study

1) The study will clarify on;

- Confirmation of the selection of commodities (food and non-food) most relevant to food security that should be included in market monitoring: which commodities in which areas.

Identification and characterization of a set of key market networks for food and cash crops and livestock, including location and type of key markets and direction and relative magnitude of commodity flows noting any significant seasonal changes in these networks.

Characterization of market structure, conduct, key functions, nature of transactions, margins along the market chain etc; Specifically look at but not limited to;

- How are markets structured for typical food commodities, livestock and fish in selected markets?
- Map the market channels and indicate how commodities flow from one market channel to another (FARM to FORK)
- Map the market players in each channel and analyze the relationships/ interactions,
- Analyze transaction costs involved in marketing of typical food commodities livestock and fisheries
- Analyze how price is built up for selected commodities; how does price discovery takes place? Who determines prices?
- Assess the existing practice of food commodity standards (including livestock and fish), i.e., What are the existing quality standards? How is quality of a commodity measured in the selected markets?
- Assess the spatial integration of markets (how are the selected markets integrated to other markets),
- Assess storage practices for the selected commodities? Is there temporal arbitrage?
- Assess the value addition activity in the selected markets,

- How do market actors access market information (farmers, traders, wholesalers, retailers, processors, consumers, etc), how do they make decisions?
- Assess policies / guidelines which influence marketing including taxation,
- Assess if there are any facilities supporting marketing such as finance service, etc. Are there any barriers to entry?
- Identify major challenges to market development

2) The study will also provide;

- Recommendations on how to improve the performance of markets,
- Suggestions for effective market monitoring which will include;
    - A list of commodities, markets, monitoring frequency and methods of data collection and transmittal of collected data to central location for processing and analysis;
    - Market structure /conduct implications on market performance, including food security outcomes. These will include seasonal patterns and market response to common stresses – poor production, civil insecurity, etc
    - Market structure and conduct indicators to monitor for food security analysis purposes
    - Recommendations on requirements for setting up a market information system for Southern Sudan;

Insights on North - South Sudan and other cross border market linkages with (especially in Malakal, Wau and Juba) as well as critical links with neighboring country markets e.g. Uganda, Kenya etc.

Extent to which, how and in what ways, markets have been evolving since signing of peace in 2005. To the extent possible comment on how markets are likely to evolve over the next several years and which indicators could contribute to monitoring that evolution.

3) Geographical coverage

Priority markets for study are **Juba, Rumbek, Wau, and Malakal**. Additional markets that include Kapoeta, Aweil, Warawar, Bor, Kuajok, Bentiu and Leer, will be studied later in 2008. Access to the latter is very much determined by rain season because roads are in dad condition and often become impassable during rains.

Deliverables/Expected outputs

A comprehensive report on the above scope of study within 14 days of completing the study

Conduct a pre and post study briefings with MAF-FAO-SIFSIA /FEWS NET/WFP and other stake holders on study focus, findings and way forward with future market related studies or activities

ANNEX II: Theoretical Framework

The Structure-Conduct-Performance model is based on the hypothesis of objective cause-effect relationship between these three aspects of an industry. The inferred relationship is that the structure of an industry determines the conduct of sellers and buyers in the industry, which in turn determines the industry's performance. The model is based on two theories— the price theory, and the industrial organization theory. The price theory proposes three basic market structural variables, viz., the degree of seller and buyer concentration; the level of product differentiation; and, condition of entry. The industrial organization theory, in addition, proposes the degree of vertical integration, industrial maturity, government participation, cost structure, diversification, and scale economies. Both theories provide well-defined theoretical predications based on the nature of these structural variables. Aspects of market conduct include collusion, pricing strategy, product strategy, responsiveness to change, research and innovation, advertising and legal tactics (Kosh, 1980). However, market assessment using these variables present major problems. In particular, most are not amenable to direct measurement. In most cases, proxies are used.

Among the structural variables, market concentration is the easiest to measure directly and interpret. There are two broad methods commonly used; partial indexes and summary indexes methods. Both are measures of inequality. Partial indexes capture only a portion of the total number of firms in an industry. The four-firm concentration ratio captures the market share of the four largest firms in an industry. The summary indexes, on the other hand, take account of all the firms in the industry. The most commonly used is the Gini Coefficient, which is a summary statistic computed from the Lorenz curve. This is the method adopted in this study. Empirical data on volume of commodities handled by traders is used to draw Lorenz curves, from which Gini Coefficients are approximated and used as an indicators of size distribution of the volume of the agricultural commodity handled. Perfect equality of size distribution, with each decile of the traders accounting for 10% of the total commodity volume handled, would be indicated by a Gini coefficient of zero. Perfect inequality would be indicated by a Gini coefficient of one. A Gini Coefficient greater than 0.5 is considered to indicate inequality, while a coefficient 0.2 to 0.35 is considered to indicate a relatively equitable distribution. The main limitation of the coefficient, however, is that it is possibly for two or more entirely different Lorenz Curve to generate quantitatively equal Gini Coefficients.