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The Competitiveness and Trade Expansion Program

MARKET ASSESSMENT AND BASELINE STUDY OF STAPLE FOODS

COUNTRY REPORT - UGANDA

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CONTENTS

CONTENTS.....	iii
1.0 INTRODUCTION	1
1.1 THE CONTEXT OF THE STUDY.....	1
1.2 THE METHODOLOGY USED IN THE STUDY.....	1
1.2.1 Documentary Review.....	1
1.2.2 Interviews with Stakeholders.....	1
1.3 STUDY LIMITATIONS.....	1
1.4 STRUCTURE OF THE REPORT	2
PART A: THE UGANDAN ECONOMY	3
2.0 AN OVERVIEW OF UGANDA’S ECONOMY	3
2.1 MAIN SECTORS OF THE ECONOMY.....	3
2.2 GROWTH TRENDS	3
2.3 RECENT ECONOMIC DEVELOPMENTS.....	4
3.0 THE STATUS OF UGANDA’S AGRICULTURE SECTOR	6
3.1 THE SIGNIFICANCE OF THE AGRICULTURE SECTOR	6
3.2 DYNAMICS OF GROWTH OF THE SECTOR.....	6
3.3 MAIN COMMODITIES PRODUCED	7
3.4 MAIN CHALLENGES AND CONSTRAINTS.....	7
3.5 AGRICULTURE SECTOR POLICIES.....	8
PART B: VALUE CHAIN ANALYSIS FOR SELECT STAPLE COMMODITIES	11
4.0 RECENT WORK DONE ON VALUE CHAINS IN UGANDA.....	11
4.1 RESEARCH BY PUBLIC SECTOR AGENCIES.....	11
4.2 RESEARCH FUNDED BY DONOR AGENCIES.....	12
4.3 RESEARCH BY OTHER INSTITUTIONS	13
5.0 THE MAIZE SUB-SECTOR.....	18
5.1 MAIZE PRODUCTION.....	18
5.1.1 Main Trends and Projections	18
5.1.2 Main Maize Growing Areas.....	18

5.2	<i>MAIZE CONSUMPTION</i>	20
5.2.1	Domestic Consumption.....	20
5.2.2	Maize Trade.....	20
5.3	<i>VALUE CHAIN MAPPING</i>	23
5.3.1	Functions Matrix.....	23
5.3.2	Volume Flows and Value Changes	25
5.4	<i>CONSTRAINTS AND OPPORTUNITIES</i>	26
5.5	<i>END-MARKET ANALYSIS</i>	27
5.5.1	Key Trends in the Maize Sub-sector	27
5.5.2	SWOT Analysis: Views from the Market Place.....	28
5.5.3	Buyer Preferences	30
6.1	<i>WHEAT PRODUCTION</i>	31
6.1.1	Main Wheat Growing Areas	31
6.2	<i>WHEAT CONSUMPTION</i>	32
6.2.1	Domestic Consumption.....	32
6.2.2	Wheat Trade.....	33
6.3	<i>VALUE CHAIN MAPPING</i>	35
6.3.1	Functions Matrix.....	35
6.4	<i>CONSTRAINTS AND OPPORTUNITIES</i>	36
6.5	<i>END MARKET ANALYSIS</i>	37
6.5.1	Key Trends in the Wheat Sub-sector	37
6.5.2	SWOT Analysis: Views from the Market Place.....	38
6.5.3	Buyer Preferences	40
7.0	THE RICE SUB-SECTOR	41
7.1	<i>RICE PRODUCTION</i>	41
7.1.1	Main Rice Growing Areas.....	42
7.2	<i>RICE CONSUMPTION</i>	42
7.2.1	Domestic Consumption.....	42
7.2.2	Rice Trade.....	43
7.3	<i>VALUE CHAIN MAPPING</i>	44
7.3.1	Functions Matrix.....	44
7.3.2	Volume Flows and Value Changes	45
7.4	<i>CONSTRAINTS AND OPPORTUNITIES</i>	45
7.5	<i>END MARKET ANALYSIS</i>	46
7.5.1	Key Trends in the Rice Sub-sector	46

7.5.2	SWOT Analysis: Views from the Market Place.....	47
7.5.3	Buyer Preferences	49
8.0	THE SORGHUM SUB-SECTOR	50
8.1	<i>SORGHUM PRODUCTION</i>	<i>50</i>
8.1.1	Main Sorghum Growing Areas.....	50
8.2	<i>SORGHUM CONSUMPTION</i>	<i>51</i>
8.2.1	Domestic Consumption.....	51
8.2.2	Sorghum Trade	52
8.3	<i>VALUE CHAIN MAPPING.....</i>	<i>53</i>
8.3.1	Functions Matrix.....	53
8.4	<i>CONSTRAINTS AND OPPORTUNITIES.....</i>	<i>54</i>
8.5	<i>END MARKET ANALYSIS</i>	<i>54</i>
8.5.1	Key Trends in the Sorghum Sub-sector.....	54
8.5.2	SWOT Analysis: Views from the Market Place.....	55
9.0	THE MILLET SUB-SECTOR	57
9.1	<i>MILLET PRODUCTION.....</i>	<i>57</i>
9.1.1	Main Millet Growing Areas	57
9.2	<i>MILLET CONSUMPTION</i>	<i>57</i>
9.2.1	Domestic Consumption.....	57
9.2.2	Millet Trade.....	58
9.3	<i>VALUE CHAIN MAPPING.....</i>	<i>59</i>
9.3.1	Functions Matrix.....	59
9.4	<i>CONSTRAINTS AND OPPORTUNITIES.....</i>	<i>60</i>
9.5	<i>END MARKET ANALYSIS</i>	<i>60</i>
9.5.1	Key Trends in the Millet Sub-sector	60
9.5.2	SWOT Analysis: Views from the Market Place.....	61
9.5.3	Buyer Preferences	62
10.0	THE CASSAVA SUB-SECTOR.....	64
10.1	<i>CASSAVA PRODUCTION</i>	<i>64</i>
10.1.1	Main Cassava Growing Areas	65
10.2	<i>CASSAVA CONSUMPTION.....</i>	<i>65</i>
10.2.1	Domestic Consumption.....	65
10.2.2	Cassava Trade	66
10.3	<i>VALUE CHAIN MAPPING.....</i>	<i>67</i>
10.3.1	Functions Matrix.....	67
10.4	<i>CONSTRAINTS AND OPPORTUNITIES.....</i>	<i>69</i>

10.5	<i>END MARKET ANALYSIS</i>	70
10.5.1	Key Trends in the Cassava Sub-sector	70
10.5.2	SWOT Analysis: Views from the Market Place	70
11.0	THE BEANS SUB-SECTOR	73
11.1	<i>BEANS PRODUCTION</i>	73
11.1.1	Main Beans Growing Areas	74
11.2	<i>BEANS CONSUMPTION</i>	74
11.2.1	Domestic Consumption	74
11.2.2	Beans Trade	75
11.3	<i>VALUE CHAIN MAPPING</i>	77
11.3.1	Functions Matrix	77
11.4	<i>CONSTRAINTS AND OPPORTUNITIES</i>	78
11.5	<i>END MARKET ANALYSIS</i>	79
11.5.1	Key Trends in the Beans Sub-sector	79
11.5.2	SWOT Analysis: Views from the Market Place	79
12.0	THE GROUNDNUTS SUB-SECTOR	81
12.1	<i>GROUNDNUTS PRODUCTION</i>	81
12.1.1	Main Groundnuts Growing Areas	81
12.2	<i>GROUNDNUTS CONSUMPTION</i>	82
12.2.1	Domestic Consumption	82
12.2.2	Groundnuts Trade	82
12.3	<i>VALUE CHAIN MAPPING</i>	82
12.3.1	Functions Matrix	82
	Value Changes 86	
12.4	<i>CONSTRAINTS AND OPPORTUNITIES</i>	86
PART C: THE BUSINESS ENABLING ENVIRONMENT FOR TRADE		
	IN AGRICULTURAL COMMODITIES	88
13.0	THE POLICY ENVIRONMENT	88
13.1	<i>PRICING AND MARKETING POLICIES</i>	88
13.2	<i>REGIONAL STRUCTURED TRADING SYSTEM PLATFORM</i>	89
13.2.1	The Food Balance Sheet	89
13.2.2	Warehouse Receipt System	90
13.2.3	The Commodity Exchange	92
14.0	THE REGULATORY FRAMEWORK	93
14.1	<i>CUSTOMS DOCUMENTATION AND CLEARING PROCEDURES</i>	93
14.2	<i>STANDARDS</i>	94

14.2.1	Specification.....	94
14.2.2	Application for Imports and Exports.....	94
14.3	<i>SANITARY AND PHYTO-SANITARY REQUIREMENTS</i>	95
14.3.1	Specification.....	95
14.3.2	Application for Imports and Exports.....	95
14.4	<i>TRADE (IMPORT AND EXPORT) RESTRICTIONS</i>	95
14.4.1	Import Restrictions	95
14.4.2	Export Restrictions	96
14.5	<i>TARIFFS, NON-TARIFF CHARGES AND NON-TARIFF BARRIERS</i>	96
14.5.1	Tariffs.....	96
14.5.2	Non-Tariff Charges.....	98
14.5.3	Non-Tariff Barriers	98
14.6	<i>LOCAL REGULATIONS</i>	99
PART D: ASSESSMENT AND WAY FORWARD		100
15.0	CONCLUSIONS, POLICY IMPLICATIONS AND RECOMMENDATIONS	100
15.1	<i>MAIN CONCLUSIONS</i>	100
15.2	<i>RECOMMENDATIONS</i>	101
REFERENCES		103

1.0 INTRODUCTION

1.1 THE CONTEXT OF THE STUDY

Staple Foods is one of the value chains which the Competitiveness and Trade Expansion (COMPETE) program, in collaboration with EAC, COMESA and EAGC has picked for purposes of enhancing economic growth and food security in East and Central Africa.

The trade flow analysis of various staple foods product reveal existing potential to increase intra-regional trade. However, despite various efforts through regional integration intra-regional trade remains very low. Trade policy and regulatory requirements have been cited by various studies as key impediments to enhancement of intra-regional trade in staple foods.

This report covers eight selected staple foods, namely: maize, wheat, rice, sorghum, millet, beans, cassava and ground nuts, among others grown in Uganda.

1.2 THE METHODOLOGY USED IN THE STUDY

The study was conducted in Uganda covering a sample of districts and stakeholders. The methodology used by the study team was intended to achieve the set objectives using the following approach:

1.2.1 Documentary Review

The study team examined the relevant documentation, which included reports, and various policy documents, and many others as indicated in the references. The purpose of the documentary review was to collect published data and information on the subject as a basis for further verification. In order to complement the documentation identified, the study team also collected relevant information from Internet websites.

1.2.2 Interviews with Stakeholders

The team also held interviews with various stakeholders, including stakeholders in Northern Uganda (Gulu, Apach, Hoima, Kabale, Kapchorwa, and Iganga) as well as selected traders in Kampala.

1.3 STUDY LIMITATIONS

While the study team did its best to fulfil the TOR as provided by the client, there were a number of limitations to contend with. First, the number of selected staple foods was big and each one of them tended to require a lot of time to be able to cover it. Secondly, many of the stakeholders, especially the farmers did not have the information required as majority of them do not keep records. In the circumstances, the credibility of the statistical data became suspect, especially with regard to production and sales spanning a number of years back. Thirdly,

there is very scanty information on some of the commodities, such as peas, barley and others because they are not widely grown or have not been studied before, meaning that the team had no starting point in its analysis. As a result, these commodities had to be dropped from the study.

1.4 STRUCTURE OF THE REPORT

This report comprises sixteen chapters divided into four parts. The first part covers the Ugandan economy with special emphasis on the agriculture sector. The analysis in this part focuses on the sector's growth and challenges. The second part focuses on the value chain analysis of eight selected commodities, looking in each case at production, consumption, trade, value chain matrix, challenges, and end-market analysis. The third part looks at the business environment, particularly the policy and regulatory framework. The final part attempts to chart the way forward.

PART A: THE UGANDAN ECONOMY

2.0 AN OVERVIEW OF UGANDA'S ECONOMY

Uganda is an African country located in East Africa. It has a population of over 30 million (UBOS, 2008). It has an area of 241,551 sq km (of which 25% is arable land) and some 46,669 sq km covered by bodies of fresh water and swamp. It borders with Kenya to the East, Tanzania in the South, Rwanda in the South-East, the Democratic Republic of Congo to the West, and the Sudan in the North. Uganda is ranked among the least developing countries, with GDI per capita estimated at \$240 (World Bank, 2003).

2.1 MAIN SECTORS OF THE ECONOMY

Uganda's economy is primarily agriculture-based. The main economic sectors include agriculture, industry and services. Table 2.1 below shows the structure of Uganda's economy compared to the other East African Community (EAC) Partner States in 2008.

Table 2.1: Sectoral Distribution of GDP in 2008 (in %)

Sector	Uganda	Kenya	Tanzani a	Rwanda	Burundi
1. Agriculture	30.2	23.8	42.5	43.2	33.7
2. Industry	24.7	16.7	18.9	22.3	20.9
3. Services	45.1*	59.5*	38.5*	34.5	45.7*
TOTAL	100.0	100.0	100.0	100.0	100.0

* 2007 Estimate

Source: World Bank

From Table 2.1 above, it is clear that Uganda (along with Tanzania, Rwanda and Burundi) has a greater share of agriculture in her GDP structure than Kenya. Kenya also has a larger share of industry and services than all the other countries of the region.

2.2 GROWTH TRENDS

In 1987, the Government of Uganda adopted the Economic Recovery Programme (ERP) to restore the economy after years of turmoil and neglect. The main thrust of the ERP was restoration of fiscal discipline and monetary stability, improvement of the incentive structure and investment climate for exports and other productive activities, rehabilitation of the country's economic, social and institutional infrastructure, and promotion of savings and investment, especially by the private sector. The ERP sought primarily to create a stable macro-

economic environment for private sector investment and fiscal consolidation as the primary means for controlling inflation.

Since 1987 the GOU has been committed to a number of macroeconomic targets, including high rates of GDP growth (about 6%), maintaining low rates of inflation, prudent debt management, and increased efficiency in resource allocation. GOU has made considerable progress in achieving these targets. The manufacturing sector registered steady growth, albeit from a small base, increasing its share in total domestic output from 4.7% in 1986 to 12% 2005. Measured as an index of industrial production, manufacturing grew 14.5% annually since 1990 (i.e. more than twice the rate of growth of the entire economy).

There has also been considerable improvement in overall investment rates. The share of investment in GDP rose from 15.7% in 2002/03 to 22.5% in 2006/07 due primarily to higher private investments. Overall, improvements in investment rates were attributed largely to good macroeconomic policies introduced by the GOU that helped to increase investor confidence in the domestic environment. Uganda's balance of payments position improved from an overall deficit of 3.4% of GDP in 1990/91 to a small surplus of 0.6% in 1997/98. The balance of payments position continued to improve, recording an overall BOP surplus position of US\$ 416.7 million compared to \$220 million in 2005/06.

Much of the transformation in Uganda's economy has its roots in far-reaching policy reforms and rural infrastructure investments. Together these provided better incentives for farmers and businesses to trade. Policy reforms also seem to have laid the foundation for more efficiency in manufacturing firms, which by 2002 had lower average input costs and higher profits per labour unit than in 1989. This underscores the importance of maintaining the existing policy framework of macro stability, competition in markets, and a level playing field for investors. However, by now there are few obvious macro and structural reforms left to be implemented. The policy reform agenda should get deeper into harder-to-spot sector specific issues to identify market failures, and to establish institutions which protect competition and fair trading, promote private sector innovation and encourage productive investment.

2.3 RECENT ECONOMIC DEVELOPMENTS

In recent years, the Ugandan economy has witnessed a number of important developments. These include:

- *Slowdown in real GDP growth:* Since 2007, Uganda's real GDP growth slowed down to 5.5% compared to 6.9% in 1990s (World Bank, 2007). Much of this slowdown was attributed to adverse terms of trade. Except in mid-1990s when coffee prices were high, the country's terms of trade have been slipping downwards. They deteriorated by about 40% between 1998/1999 and 2003/04 (before improving slightly in 2004/05) with nearly of Uganda's main exports

suffering slumps in international prices. This coincided with the rise in the prices for petroleum, just as consumption in petroleum in the country was increasing.

- Slowdown in structural transformation: Since 1999, there has been a slowdown in structural transformation, in which the contribution of all sectors (except construction) to GDP growth fell. Growth in agriculture fell to 3.3% in 1999/00-2004/05 (World Bank, 2007). The sector's contribution to annual GDP growth of 5.5% was just 1.3%. Industry decelerated to 7.0%, contributing 1.6 percentage points to GDP growth. Within industry, the growth of manufacturing declined from 12.3% over the 1990s to 5.6% in the period 1999/00 – 2004/05 and contribute 0.5 percentage points. The services sector the biggest source of GDP growth, declining only modestly to 6.8%. It contributed 2.6 percentage points to GDP growth. The slowdown in structural transformation is seen by some observers as the peak in Uganda's manufacturing recovery or a call for incentives in order to attract more investment.
- Consumption driving economic growth: Although it is becoming less so, nonetheless, the economy is still consumption-driven. In the period 2002 – 2007, consumption accounted for about 85% of growth in aggregate demand with private consumption accounting for 75%, compared to 93% and 80%, respectively in the 1990s. The slowdown is seen as a return to normal levels, following the post-conflict rebound and the end of TOT gains in the mid-1990s.
- Fast growth in investment and exports: Although still small, private investment and exports continue to be the fastest component of aggregate demand. Since 2000, investment has accounted for 20% of annual growth, compared to 17% in the recovery and reconstruction period of the 1990s. Exports accounted for 15% of growth since 2000, compared to 14% in the 1990s. The investment patterns show rising private construction, falling machinery and public construction.
- Low total investment: Total investment remains low by international standards and its composition may no longer as productive as it was in the recovery period. The share of private investment in GDP in 1997/98 – 2004/05 is the same as it was in 1992/93 – 1996/97, but a fall in the machinery and equipment component was offset by an exactly equal rise in private construction. The decline in public construction investment therefore accounts for the overall fall compared to the rapid growth period.
- Diversification of exports: Overall, there has been a gradual diversification of exports, especially an increase in non-traditional exports, in the face of falling prices for Uganda's traditional exports (coffee, cotton, and tea). This is an encouraging sign of economic transformation. By far the main driver of the increase in export revenues has been fish and fish products. Tourism has also contributed to the increase in exports.

3.0 THE STATUS OF UGANDA'S AGRICULTURE SECTOR

Uganda is a predominantly an agricultural economy. Agricultural production comes almost exclusively from 2.2 million smallholders, mostly working 2 to 3 hectares of land, using traditional methods of cultivation and family labour. Indeed, it was Uganda's subsistence agricultural production that helped the population to survive the devastation and collapse of the modern economy during the years of turmoil and to this day many people depend on plots of land or gardens to provide a steady supply of food. Even in urban centres there is a farming tradition, which (due to uncertain supply of food from rural areas), leads to urban agricultural production. Estimates indicate that 30% – 50% of families in Kampala engage in agriculture.

3.1 THE SIGNIFICANCE OF THE AGRICULTURE SECTOR

Agriculture has an important role to play in Uganda's economic development. It is a source of food supply and raw materials, a supplier of foreign exchange, a market for non-agricultural output and a source of surplus for investment (MAAIF, 2008). Agriculture is central to Uganda's economic growth and the reduction of poverty, accounting for large share of GDP, exports, and providing employment to a large section of the rural population.

The agriculture sector is also a major source of foreign exchange earnings, accounting for 48% of total export revenues (MFPED, 2004) and was the main reason for successive current account surpluses over the years. Table 3.2 shows the contribution of the agriculture sector to Uganda's exports. It is also a major source of a large proportion of raw materials for the country's agro-processing industrial sector (coffee hulling, cotton-ginning, grain milling, dairy processing, etc).

As source of income and employment, agriculture accounts for about 69% of total employment. Crop farming is the main source of household income contributing just over 30% of all household income in Uganda. Other incomes include farm enterprises such as animal husbandry, poultry and cottage industries such as brewing. According to the MFPED (2004), households engaged in the traditional cash crop sector are better off than those in the traditional food crop sector and to that extent, areas and farmers growing coffee have benefited more from price liberalization policies and increased access to markets than areas growing mainly food crops.

3.2 DYNAMICS OF GROWTH OF THE SECTOR

The performance of Uganda's agriculture sector has been extremely variable since over the years. Because Uganda's agriculture depends on rainfall, poor weather conditions result in low yields and poor performance, in some parts of the country or sometimes for the sector as a whole. Prolonged dry conditions or wet

conditions associated with heavy rainfall, for example, have negatively affected agricultural production in recent years.

Growth in the agriculture sector doubled in 2008/09 and stood at 2.6% per annum (MFPED, 2009). This growth was driven mainly by an increase in production of food crops, which grew at 2.9% in 2008/09 compared to 2.4% in the previous year. The improvement in food crops production was attributed to refocusing of service delivery through the National Agricultural Advisory and Delivery Services (NAADS), and the recovery of agriculture in the northern parts of the country. Moreover, the high market prices for food crops were an incentive to increased acreage.

3.3 MAIN COMMODITIES PRODUCED

With a favourable climate year-round and some of the best agricultural land in Africa, Uganda produces a wide variety of tropical and sub-tropical agricultural products throughout the year. There are four major sub-sectors in Uganda's agriculture sector: crops, livestock, fisheries, and the forestry. Of the four, the crops sub-sector is by far the largest in terms of area and contribution to GDP. Much of this is food crops for subsistence by smallholder households, with only a third sold to domestic and export markets (World Bank, 2005).

The main food crops are tubers and roots, (cassava, sweet potatoes, yams, etc) bananas, cereals (maize, millet, sorghum, etc), pulses (beans, peas, etc), oil seeds, fruits (pineapples, papaya, bananas, avocados, mangoes, oranges, etc) vegetables, spices (vanilla, cardamom, pepper) and flowers. About 49% of the food crops are marketed or bartered for subsistence consumption outside the market system. In 2000 – 2007, there was a marked increase in food production, although this has been achieved through increased acreage in cultivated land rather than an improvement in yields overall. The major cash crops for the economy are: coffee (accounting for 272,000 ha and generating about \$300 million per annum), cotton (previously the main export crop, earning up to US\$ 30 million a year), tea (grown on 20,570 ha, but mostly for export markets earning about \$30 million a year), tobacco (grown on 11,590 ha and now earning over \$10 million a year), sugar cane (grown almost exclusively for the local market) and cocoa (which is a relatively new crop).

3.4 MAIN CHALLENGES AND CONSTRAINTS

During the 1970-1980s growth in the sector was hampered by a series of policy and structural constraints which are well articulated in the Plan for Modernisation of Agriculture (PMA). While many of these constraints have been removed, nonetheless, a number of fundamental ones do persist remain to this day. They include poor infrastructure (such as feeder roads, communication facilities, power supply, water, etc), lack of efficient and cost-effective technology, low rates of adoption of appropriate technology, lack of finance, a complicated land tenure system, information constraints, weak farmers' organisations, lack of market

information, high post-harvest losses, environmental degradation, etc.

3.5 AGRICULTURE SECTOR POLICIES

3.5.1 The Plan for Modernisation of Agriculture

The policy environment for the agriculture sector in Uganda in the last eight years has been shaped by the *Plan for Modernisation of Agriculture (PMA)*. The PMA is a strategic and operational framework for the transformation and structural change of the subsistence farming sector through policy, institutional and organisational reforms and changes in the type and methods of service delivery leading to increased profitability and competitiveness in the agriculture sector. The PMA has been part of the wider planning framework for the country – the *Poverty Eradication Action Plan (PEAP)*. The PMA has seven key pillars (Box 3.1) whose implementation mandates spread across 13 ministries and agencies. The concept behind the PMA was simple – that to reduce poverty among poor households the majority of who depend on agriculture, a holistic approach had to be taken, hence the seven interventions.

An evaluation of the PMA conducted in 2005 found that the concept was still valid, but implementation of the framework was a challenge¹. Right from the start of implementation, government and development partners made an error by providing financial support and institutional development to only two of the PMA pillars:

agricultural research and technology development (NARO or NARS in general); and national agricultural advisory services (NAADS). The other five pillars did not receive adequate attention, and overtime gaps for their non-implementation started emerging. For example, by 2005, the need for rural financial services and value addition (both of which were in the PMA) started to become clear.

Box 3.1: The Pillars of the PMA

1. Research and technology development
2. National agricultural advisory services
3. Rural finance
4. Agro-processing and marketing

3.5.2 The Rural Development Strategy

The need to fill the gaps in PMA implementation led to emergence of alternative thinking about agriculture and rural development. Thus, in 2005 the *Rural*

¹ The report notes that “The overall logic of the PMA still holds good, but there have been confusion over the function of the PMA, insufficient emphasis on some of the constraints identified, and weaknesses in the implementation which should be addressed.” (GOU: A Joint Evaluation. Uganda’s Plan for the Modernization of Agriculture, October 2006)

Development Strategy (RDS) was formulated, with the overall objective of raising household incomes, like the PMA, but proposing a more focused approach to supporting farmers through input provision and formation of cooperative societies. The focus of RDS was the sub-county, and this led to the development of the Sub-County Development Model.

3.5.3 Development Strategy and Investment Plan

In 2006, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) developed the so-called *Development Strategy and Investment Plan (DSIP)* as medium-term plan. The DSIP was intended to translate the national goals and priorities contained in the PMA into a plan for public sector activities in the agriculture sector. It was also designed to clarify the objectives and outputs for the sector and to bring out priority areas for spending in the period 2005/06 – 2007/08. The DSIP drew from the PMA priority areas in which public sector action was required in the medium term to support the modernisation of agriculture, especially those that fell within the mandate of MAAIF and its agencies. It is these priority areas that informed the DSIP investment areas and have been the basis for the Ministry's planning and budgeting in recent years. Although there has been no comprehensive review of its performance, observers have found that it has not been effectively implemented. The main problems are sighted as weaknesses in internal coordination and the failure in aligning public resources to the DSIP priorities. DSIP expired in June 2008, but it is now being revised as DSIP II.

3.5.4 The Prosperity for All Programme

In 2006, Government formulated a much broader vision - the *Prosperity for All (PFA)*. The PFA not a policy as such, but a programme, which attempts to put in place varied but integrated socio-economic programmes targeting mainly the rural poor in order to transform them into productive and prosperous communities. The programme seeks to achieve prosperity for all through production, value addition, agro-processing, improved marketing, savings and accessibility to affordable credit.

In 2007, Cabinet directed the MAAIF to coordinate all agriculture-related programs of the PFA through the PMA Secretariat. The direct contribution of agriculture to PFA is by assisting agricultural households to engage in activities that raise their incomes from the current low levels towards a target of Shs 20 million per household per year. This will involve identification and promotion of a number of agricultural enterprises which will gradually raise household incomes toward the target. The target is poor farmers that have productive assets such as land, but need support to get the most out of that land. This will involve selection of 30 model households per sub-county (about 6 per parish), organising farmers into production groups, marketing groups or savings and cooperative societies (SACCOs). By forming groups, farmers will be able to produce large quantities of

quality products that make collective marketing possible and enable them to bargain for higher prices.

PART B: VALUE CHAIN ANALYSIS FOR SELECT STAPLE COMMODITIES

4.0 RECENT WORK DONE ON VALUE CHAINS IN UGANDA

A value chain consists of all value-generating activities (sequential or otherwise) which are needed to produce, deliver and dispose of a commodity (Schmitz, 2005). More specifically, it “describes the full range of activities which are required to bring a product from conception, through the different phases of production (involving a combination of physical transformations and the input of various producer services), to delivery to the final consumer and final disposal after use” (Kaplinsky and Morris, 2000).

Since activities may belong to different sectors of the economy, commodity value chain analysis is a multi-sectoral framework for studying the inter-linkages among the activities associated with the commodity. Thus, value chain analysis primarily involves drawing the economic map or footprint of inputs arising directly from the production, use and disposal of a commodity.

In Uganda some work on value chain has been conducted by various bodies, both in the public and private sectors. More recently, this has also attracted the donor community which has sponsored studies on value chain analysis in various sectors of the economy. This section attempts to summarise some of the work recently done (those that the consultant was able to access!) in the agriculture sector by public sector agencies, research funded by donor agencies, and research by other institutions.

4.1 RESEARCH BY PUBLIC SECTOR AGENCIES

- **NRI/IITA (2002), Transaction Cost Analysis Report:** This study was commissioned by the Ministry of Finance, Planning and Economic Development (MFPED) on behalf of the Plan for Modernisation of Agriculture (PMA). The study centred on six key commodities (coffee, cotton, fish, maize, cassava, and dairy products). Its main focus analysis of transaction costs along the value chain of these products. The main objective of the study was to recommend implementation plans which would help to overcome constraints to marketing and processing efficiency and improve farm gate prices to small holders.

The key findings arising from the study were prioritised according to their importance to the implementation of the PMA. In the study, cross-cutting issues are given priority over findings solely applicable to specific commodities. These include the poor bargain power of farmers, progress made in improving main roads and feeder roads, problems of competitiveness on account of being landlocked, the high cost of borrowing and the lack of long-term finance, lack of market information, unreliability of electricity supply, etc.

In the context of commodity specific findings, the study notes that while maize is not a traditional staple food for the majority of Uganda's population, nonetheless, it plays an important role in the rural and urban diet. Further, that following the liberalisation of the grain sector, there are no significant policy, regulatory or institutional constraints to the development of the sector. With regard to cassava, the study notes that this is a major staple food in Uganda, consumed either in dried flour or fresh form and its importance as a guarantor of food security outweighs its role as an income generating commercial crop.

The study makes a whole range of recommendations of a general nature and specific to commodities.

4.2 RESEARCH FUNDED BY DONOR AGENCIES

- **USAID (2008), Stabilisation-Driven Value Chain Analysis of Rice, Groundnuts and Maize in Northern Uganda:** This study focuses on three important value chains in Northern Uganda – maize, rice and groundnuts. This part of the country has been plagued by conflict over the last two decades. So the study attempts to examine the value chains against the background of post conflict stabilisation.

The study makes important findings and recommendations. In terms of crop production, the study notes the low yields for all the three crops, the small size of acreage, domination by a low input regime, poor access to improved seeds, and the low skill level of farmers. In terms of marketing, the main findings include the domination of small- and medium-scale buyers, demand for commodities such as maize far outstripping supply, some demand also coming from neighbouring South Sudan, low levels of capital of the buyers, and the limitations of value addition for the three main value chains.

The study recommends measures to improve yields, (including availability of affordable quality inputs, provision of extension services, provision of tractor business services, etc), increase access to value addition technology, improvement of access to credit, improvement of the enabling environment.

- **Rates (2003), Market Assessment and Baseline Study for Maize – Uganda:** “RATES” is the USAID funded Regional Agricultural Trade Expansion Support Programme, which was implemented by Chemonics. The study examines the supply and demand characteristics, including production and consumption, maize trade (exports and imports) as well as projections. It also looks at the policy and regulatory environment.

The study makes a number of important findings, at the production, marketing and milling levels. The main findings at the production level include low input utilisation and yields, poor post-harvest handling methods, inadequate storage capacity, low bargaining power at harvest season, etc. At the marketing level, there are many participants in the chain, poor rural road network, limited business

exposure curtailing penetration of regional markets, domination of the chain by part time speculators, weak information system, etc. At the milling level, there is little value addition, unreliability of maize supplies, capital inadequacies, poor machinery, lack of information about alternative value addition, etc.

Looking at the regulatory framework, the study notes the government's liberal marketing strategy for food crops, abolition of the monopoly hitherto enjoyed by marketing boards, removal of price controls and export taxes, etc. The requirements for export include a fumigation certificate, a phytosanitary certificate, a quality standards certificate, etc. The UNBS has developed a quality standard to guide exports of maize, and the study notes its main features. Further, the study notes the fact that imports of maize from COMESA attract 4% tariff, etc.

The main recommendations of the study include the need to increase the flow of market information, advocating for elimination of unfair trading practices, lobbying for the abolition of tariffs, promotion of harmonisation of quality and phytosanitary requirements, etc.

- **USDA (2002), Uganda Grain and Feed Wheat Update:** This study was commissioned by the Foreign Agricultural Service of the US Department of Agriculture. It was approved by the US Embassy in Uganda. The study focuses on wheat. It notes that production of wheat in Uganda is small ranging between 2,000 and 10,000 metric tonnes per year. It estimates the market size at about 120,000 MT per year, noting that most of the wheat produced in the country is imported from countries such as Australia and Argentina. It quotes the Ministry of Agriculture estimates of production of about 10,000 MT in 2001 with a forecast of 12,000 the following year.

The study notes that all the wheat produced at the time came from Kapchorwa district neat the eastern border with Uganda, where production is based mainly on broadcasting seeding with saved seed. The study notes further that of the amount produced, about 20% is consumed on the farm. At the time of the study, there were about five millers in the country, indicating a market size about 120,000 MT of wheat per year.

4.3 RESEARCH BY OTHER INSTITUTIONS

- **ASARECA (), Value Chain Analysis for Cassava Flour and related Products: A Case Study of Uganda and Kenya:** This research was intended to conduct a markets oriented value chain analysis of cassava flour and related products in Uganda and Kenya, and to share its findings in order to show how cassava value addition technologies can be introduced.

The study findings indicate that although most industrial segments report a non-utilization status for cassava chips, there is enormous demand potential with major private sector players demonstrating keenness to include cassava chips in

the processing of animal feeds. The study finds high demand for cassava chips among animal feeds processors in Uganda at a unit price of US\$ 0.11, as well as enormous industrial opportunities in the baking industry, where there is high demand for cassava flour. In spite of these opportunities, however, the existing institutional framework does not favour optimal exploitation of the emerging and potential opportunities. First, it notes the weak organisational capacities of the producers in Uganda (and Kenya), the underutilised value addition technologies, etc.

At the level of production, the study notes that production capacities in Uganda (and in Kenya) are constrained by such factors as poor group organisational capacities, lack of commercial skills, crop diseases such as cassava mosaic, poor access to improved planting materials, limited land size, inadequate inputs for production, inadequate labour, poor market linkages or access to profitable markets and poor access to credit facilities. The main value addition challenges in both countries are poor access to value addition technologies and knowledge. The key constraints for intermediaries along the trading systems include limited or poor and latent demand for most of the products, high trading costs, notably transportation and market fees affecting their business profitability, lack of storage facilities, poor access to market information, seasonal availability of the products, and poor linkages with producers. Processing constraints include poor quality of raw materials, seasonal inadequate supplies, products' perishability, poor demand for the products, unstable prices for products, high transportation costs, stiff competition from other products, etc.

The report generally recommends institutional reforms based on principles of commercialisation. It recommends participatory identification of key players, strengthening of partnerships amongst all value chain players, strengthening access to business development services by all players in the value chain, strengthening of organisational and commercial capacities at the production level, etc.

- **NRI/FoodNet/IITA/KARI (2000), Industrial Markets for Starch-based Products: An Assessment of the Industrial Potential for Cassava in Uganda:** This study focuses on starch, starch-based adhesives and cassava flour for industrial use, and provides an assessment of the potential for locally made cassava-based products to replace existing raw materials derived from starch.

The study makes the following key findings:

1. The total market for starch-based products in Uganda is 580 tonnes per annum; this market can be broken down into starch (64%), cassava flour (28%) and starch-based adhesive for paperboard (8%). The market for starch is dominated by native maize starch, mainly imported from Kenya and South Africa. Modified starches are not important in the market, accounting for 0.07% of total demand. Most of the imported starch is used by the

- pharmaceutical industry (53.6%) followed by paperboard (32.5%), food processing (13.5%) and commercial laundries (0.4%).
2. Prices for starch vary according to product grade. Technical grade starch costs between US\$470-500 per tonne delivered to factory gate. Food grade starch ranges between US\$545-631 per tonne delivered to factory gate, and pharmaceutical grade starch costs between US\$800-1,100 per tonne delivered to factory gate.
 3. Locally made cassava flour is used as a substitute for imported starch by three out of six plywood, paperboard and textile factories in Uganda. These industries consume 216 tonnes of cassava flour per annum, and potential exists for a 33% increase in demand for cassava flour by 2005. However, industrial demand for cassava flour accounts for 0.09% of cassava flour production in Uganda. The majority of cassava flour is used as food.
 4. Cassava chips have the potential to partially replace (10%) maize/maize bran in animal feed rations. High-quality cassava flour has potential to partially replace (10%) wheat flour in bread and biscuits, and to completely replace imported starches and flours in plywood, paperboard and textile manufacture.
 5. Cassava chips in animal feed is the sector with most potential for realisation with the next 5 years. The market is relatively large (equivalent to 18,750 tonnes of fresh cassava roots per annum). The technology for production is quite simple and well suited to rural areas, and quality specifications should be relatively easy to meet. The livestock feed industry would be interested in cassava as a feed ingredient, if successful field trials can be made, and reliable supplies of cassava ensured.
 6. High-quality cassava flour in bread is an attractive area, with a market size equivalent to 26,400 tonnes of fresh cassava roots per annum. Representatives of the bakery industry expressed strong interest in testing cassava flour, as a means of reducing production costs. However, problems with gluten sensitivity and consumer acceptability remain as serious concerns that could hinder or prevent realisation of this opportunity.
 7. High-quality cassava flour can readily replace imported materials in paperboard, textile and plywood manufacture and could replace 10% of wheat flour in the manufacture of biscuits. These markets are all small in size, with a total potential demand equivalent to 1,594 tonnes of fresh cassava roots per annum. They could offer suitable outlets for small groups of processors, but are too small to have any real impact on supply and demand for cassava in Uganda.
 8. Total potential demand for cassava as an industrial commodity is approximately 46,744 tonnes of fresh cassava roots per annum, which

accounts for only 2% of the annual production of cassava in Uganda. There appears to be no potential for production of starch (either cassava or maize) in Uganda, as the internal market size is too small to provide scope for recovery of the investment cost. Surplus production might be exported to other countries in the region but investors should expect stiff competition from rival concerns in Kenya and South Africa.

9. Existing linkages between the private sector and research organisations in Uganda are very limited. In discussions with representatives of the food and livestock feed industries it became apparent that industry is unaware of the wealth of research findings available from local and international researchers.

The main recommendations of the study are:

- Funds should be sought to enable dissemination of information about the potential for cassava chips and high-quality cassava flour in animal feeds and bakery products through awareness seminars and practical workshops for the various stake-holders (especially private sector) in the target industries.
- Creation of an opportunity for key representatives of the private sector involved in development of links with rural processors and potential processors to visit established cassava-based agro-industries in South and South East Asia, to obtain first hand experience of the successful strategies for development of industrial uses of cassava, and the technologies available.
- Adoption of an integrated approach, whereby research organisations closely link with private sector partners to examine issues of economic and technical feasibility of exploiting each opportunity, preparation of business plans, and development of links between urban end-users of the product and rural producer of fresh or dried cassava.
- Research into identification of areas of Uganda that have the greatest potential to provide steady supplies of cassava for industrial use. This work could focus on the specific districts and could take into account issues of availability, price, competition from traditional markets, potential for surplus production, access to roads and proximity to industrial areas.
- Market surveys are required of existing and potential markets for starch-based raw materials in Kenya, Tanzania and Rwanda. Emphasis should be placed on characterisation of existing markets, and determination of the potential for cassava to replace existing materials. Ugandan manufacturers would be interested in assessing the potential for regional exports of cassava-based products from Uganda.
- Sensitisation of farmers about the importance of producing dried cassava of consistently high quality in order to meet the requirements of the potential end

users. Farmers need to be trained and equipped with the necessary techniques for producing a high quality product. If necessary, proven technology could be bought from countries such as Ghana that already have experience of production of high-quality cassava products for industry under rural conditions.

- Quality assurance remains a key issue for realisation of any of the industrial opportunities for cassava. Realistic standards need to be defined and mechanisms put in place for monitoring end product quality so as to ensure that markets are not spoiled through errors resulting from ignorance or wilful adulteration of products. Standards can be developed in collaboration with industry, and the producers of the products, but the monitoring and enforcement of quality assurance should be handled by an independent body, such as the Ugandan National Bureau of Standards.

5.0 THE MAIZE SUB-SECTOR

Maize was introduced in Uganda in 1861 (MAAIF, 1988) and has since become a major part of the farming system, ranking third in importance among the main cereal crops (finger millet, sorghum and maize) grown in the country. Maize has been traditionally cultivated in Uganda by small-scale farmers both as a source of food and for income generation. It is now one of the ten agricultural crops which the Government has prioritised in its *Rural Development and National Zoning Strategy*.

5.1 MAIZE PRODUCTION

5.1.1 Main Trends and Projections

Maize is grown predominantly by peasant farmers on a subsistence level, except for a few emerging commercial farmers. Peasant farmers have land holdings of between 0.2-0.5 ha under maize production, while the few medium- to large-scale farmers have 0.8-4.0 ha. Nevertheless, peasant farmers account for up to 75% of maize production and contribute over 70% of marketable surplus. Large-scale farmers account for 25%, their share is growing because of the increased regional demand and structural reforms in the maize international trade.

Majority of the peasant maize farmers grow a mixed variety of *Longe 4* and *Longe 5*. *Longe 4* is an open pollinated variety of maize developed to be fast-maturing and drought-resistant. *Longe 5* is also an open-pollinated variety of what is described as quality protein maize (QPM). It was developed to be more nutritious and was initially expected to fetch a higher price on the market for human and animal feed. However, as it turned out, there was no evidence of such a premium price being offered to farmers.

Maize production in Uganda is characterised by generally low yields, which result in high unit costs and low returns. Irrespective of farm sizes, the yield levels in Uganda are low, standing at 1.0-1.8 MT/ha (4-7 bags [100 kg] per acre). This is explained by the limited use of agricultural inputs where farms are managed in a typical traditional system. For example, the only inputs are family labour and home saved seeds. Such low yields result into high unit costs of production, which have been estimated at UShs 120-180/kg [US\$ 6-9 cents] per kg, with gross margins being less than UShs 50,000 [US\$ 25.6] per ha. Moreover, of the estimated 500,000 – 750,000 MT of maize produced per annum, 15% is lost through harvest losses and 20% is retained at household level for consumption and seed (USAID, 2008).

5.1.2 Main Maize Growing Areas

Uganda has ideal conditions for maize production (such as fertile soils, ample rainfall [annual rainfall of 1,000 mm of which a minimum of 400 mm are required for the growing season. Because of these good conditions, maize is widely grown in most parts of the country. The main production areas include:

- Western (Kabale, Masindi, Kasese, and Kabarole districts);
- Central (Mubende, Kiboga, Masaka, Mukono, and Rakai districts);
- Eastern (Iganga, Kamuli, Bugiri, Mayuge, Sironko, Tororo, Mbale, and Kapchorwa districts); and
- Northern (Arua, Nebbi, Apac, Lira, Kitgum, and Gulu districts).

The concentration of maize in these districts is explained by several factors including the ethnic nature of the population, the influence of immigrants, especially from Kenya, and the ready market for dried grains in the vicinity. The Eastern region accounts for over 50% of annual total output (NRI/IITA, 2002). Countrywide, the area under cultivation varies widely from district to district, although in recent years, there has been a steady increase, ranging between 750,000 and 800,000 ha (Table 5.1). Similarly, yields also vary from district to district depending on the soil and climatic conditions. However, the overall national yield of maize is estimated to range between 1.40 – 1.50 tonnes per hectare (MAAIF 2008).

Table 5.1: Maize Production in Uganda, 2004-2008

	2004	2005	2006	2007	2008
Area Planted (000' Ha)	750	780	819	839	682
Volume (MT 000')	1,080	1,237	1,258	1,262	1,266

Source: UBOS, 2009

Maize grows well in areas with annual minimal rainfall of 700 mm. The crop takes about 4 months from planting to harvest in the low land areas and up to 8-9 month in the Kapchorwa highlands of Mt. Elgon. The crop has two seasons. The first season runs from January to March and, the second season is from July to August. In other districts like Kapchorwa and Mbale, maize harvests occur between October and December. Some areas can support two seasons a year, while others can only support one season because of the insufficient rains or extended length of the growing season.

Maize yields in the above districts differ by agro-ecological zones. Farmers in potentially high maize-growing areas harvest between 4-6 MT/ha, especially in Kasese and Kapchorwa districts. In the districts of Iganga/Bugiri, Masindi and Kasese, open pollinated maize varieties are grown and harvested twice a year, while in Mbale and Kapchorwa hybrid maize is grown and harvested once a year. In Kasese the second season is larger than the first season unlike for the rest of the districts where maize is grown twice a year.

5.2 MAIZE CONSUMPTION

5.2.1 Domestic Consumption

While maize has been grown for a long time in Uganda, nonetheless, unlike in neighbouring countries (Kenya, Tanzania, etc), it does not form a major part of the population's traditional diet, but is grown primarily for income generation, rather than for food security. However, the growing cost of traditional staple foods (such as bananas [*Matooke*] has had the impact of increasing maize consumption, especially in urban areas. Kampala alone accounts for about 50% of formal trade in maize. The domestic market for maize in Uganda is estimated at 350,000 - 400,000 metric tonnes per annum (NRI/IITA, 2002). In 2007, domestic consumption remained at 400,000 MT out of a national availability average of approximately 638,000 MT (USAID, 2008).

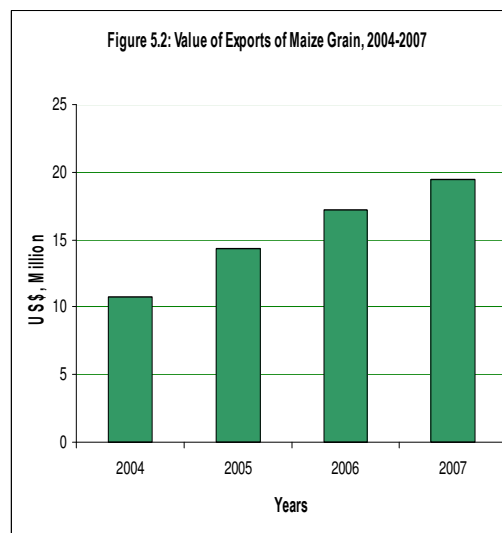
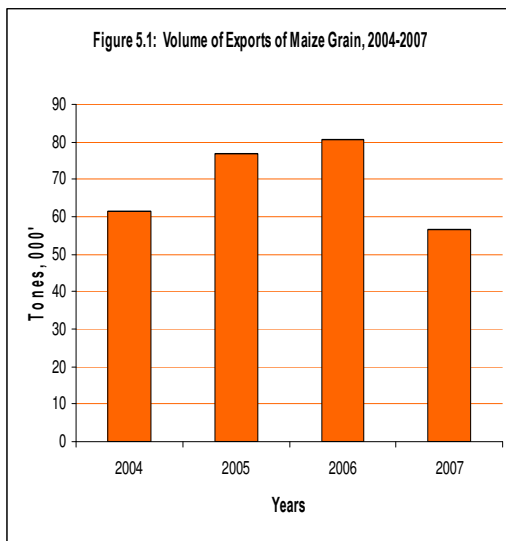
The main domestic market for maize is Kampala, which accounts for about 50% of the formal trade. The main buying centre is the Kisenyi market which has a concentration of processors (about 88 millers). The main domestic demand for maize is from institutions (schools, prisons, hospitals, etc). Major institutional buyers of maize include the World Food Programme (WFP), which stocks supplies destined for distressed areas both within Uganda and the region (DRC, Burundi and Rwanda) and the Uganda Grain Traders Limited (UGT), which is an association of 16 Ugandan major trading companies.

Maize is consumed in various forms – grilled or whole, as a cake [*Posho, or Ugali*], or as porridge – especially in urban centres. Over 70% of the maize is consumed as food, and about 10% is used as animal feeds (maize bran). There is also increasing demand of value-added products (maize flour, poultry feeds, etc) especially in urban centres where maize is gaining importance both as a major food item and for income generation.

5.2.2 Maize Trade

A. Maize Exports

Uganda's maize export market is mainly regional, comprising of markets within Eastern and Southern Africa, the Democratic Republic of Congo (DRC) and Southern Sudan. The country benefits from the unfavourable climate and low soil nutrition in these neighbouring countries, as well as from its two annual harvests. In 1986, Government of Uganda (GOU) started a programme to promote non-traditional exports, including maize, beans, soya beans, sesame, groundnuts, etc in order to diversify the country's export base and to capture this regional market. Since then a considerable amount of maize has been exported to the region.



Source: Uganda Revenue Authority

Uganda's export potential for maize is estimated at between 200,000 and 250,000 MT per annum. Nonetheless, the country has only managed to export half of this amount, reflecting a low level of penetration. The main constraints to penetration into the regional markets have included poor quality and unreliability of supply. Maize exports fell slightly by 1% in value terms (from US\$ 24.1 million to US\$ 23.8 million) and 12% in volume terms (from 115,259 MT to 101,233 MT) from 2006 to 2007 (USAID, 2008). This was attributed to the late start of the season in Uganda.

Maize is sold across borders through Mutukula (for Tanzania), Busia (for Kenya), Gatuna (for Rwanda), etc. In 2009, an estimated 225 MT of maize crossed Mutukula to Tanzania, 120,112 MT was exported to Kenya via Busia, while 32,805.5 MT was exported to Rwanda through Gatuna. The challenge for this market, however, has been the increasing informal cross-border trade with the neighbouring countries. Of all the five neighbouring countries, Kenya dominates the informal export destination (71%), followed by the DRC, Southern Sudan, Rwanda, and Tanzania. However, there is a strong potential for Uganda to increase maize exports to Sudan following the recent peace settlement.

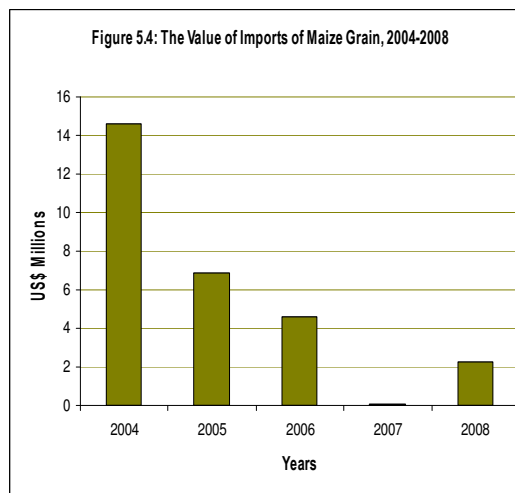
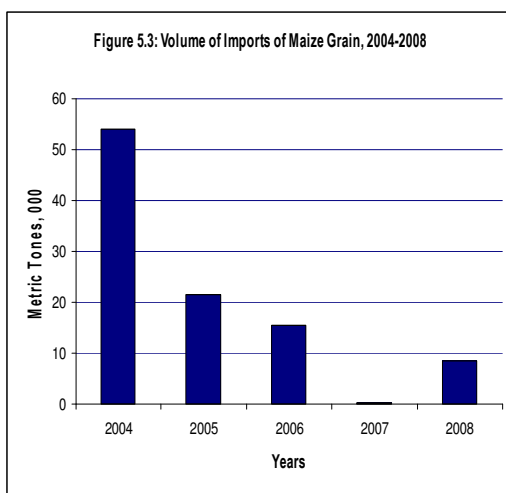
There has been a vibrant cross-border trade in maize with these regional markets. According to the WFP and RATIC's regional trade database, internal procurement and trade, in maize along Uganda's eastern and southern borders with Kenya and Rwanda, respectively, remains brisk, as high demand for maize in the neighbouring countries increased the flow of maize from production centres in Uganda. In normal production years, Uganda has surplus maize for export. Traditionally, demand for maize has come from Western Kenya, which has provided a market for the surplus maize from Eastern Uganda. Of late, however, exports of maize to Southern Sudan are on the increase. Trade in maize to these

markets is entirely informal. Consequently, there are no accurate data on volumes and values exported to these countries. According to NRI/IITA (2002) in good production years, around 100,000 metric tonnes of Ugandan maize are sold to Kenya. Uganda's export volumes have been dictated by weather patterns in the country (especially rains coming on time) and the reduced harvest in the neighbouring countries.

Southern Sudan is an important end market for Ugandan maize and to that extent northern Uganda has a geographical advantage to exploit this market. However, the region has not yet been able to reap significant benefits from this market because of low levels of production and a lack of organised marketing. The post-conflict environment in the Southern Sudan is another risk factor, especially for Ugandan traders who have often been attacked by lawless gangs. This is exacerbated by the unclear taxation regime, and most importantly, by the unclear political future, which depends on a number of factors².

B. Maize Imports

Formal imports of maize have been declining since 2004. They fell from about 14.6 MT in 2004 to a low of 0.1 MT in 2007, before rising slightly to 8.4 MT in 2008 (Figure 4.3). Imports of maize have been high in seasons of low harvest, especially on account of variations in rainfall patterns. By and large, however, Uganda has always been self sufficient in maize production and has not been dependent on imports.



Source: Uganda Revenue Authority

² Such as the implementation of the Comprehensive Peace Accord, the indictment of President El Bashir by the International Criminal Court, the outcome of the 2009 presidential election and the 2011 referendum, among others.

5.3 VALUE CHAIN MAPPING

5.3.1 Functions Matrix

The transactions involved in the marketing of maize are complex. This study identifies and focuses on just four of them. These are:

- (i) from farmer (farm gate) to agents / traders store/rural market in rural areas;
- (ii) from rural market to urban market;
- (iii) from urban market to major buying centres outside the district; and
- (iv) the export market.

Each of these transaction functions involves a number of key players as discussed below.

A. Rural Agents

Rural agents are the main buyers of all maize traded in the sub-counties (smaller administrative units in the districts). Their main function is to buy and/or assemble maize from the numerous scattered farmers, often located in inaccessible rural areas. These rural agents use bicycles to transport the maize from the farmers to their collection points. They find market for the maize (often the urban traders and processors) when they have accumulated sufficient quantities. The urban traders and processors arrange transport to collect the maize either directly from the farmers whom they pay on a cash basis, or from the collection points of the agents. Since the agents live in the rural areas, they are a reliable linkage between the farmers and urban traders and processors/millers. Their profit is about Shs 5 – 10 per kg of maize assembled.

B. Urban Traders

Urban traders are found in major urban centres in the district. Their main activities include networking with rural agents, serving as a market outlet for farmers, and collecting maize grain before selling it to the various clients, including institutions and maize at Shs 380 – 400 p processors, located in the districts. Urban traders are also sources of bagging materials (sacks) used by farmers as well as market (price and volumes) information in their areas of operation. To cover the costs of rural agents and transport, urban traders sell their maize mostly to processors. As a result, their profit margin is between Shs 60 and a loss of Shs 20 per kg sold.

C. Processors/ Millers

The maize grown and traded undergoes some level of value addition – conversion of maize grain into flour and a variety of other by-products, such as bran and germ. The principle players in this value chain are the processors/ millers,

grouped into three categories, namely: small-scale millers, medium-scale millers and large-scale millers.

Majority of the processors/millers fall under the small-scale category and they are scattered in various rural trading centres in the districts, carrying out primarily customised milling. They operate hammer mills of less than 10 tonnes per day, mainly on a contract basis. In other words, they mill customers' maize on order and at a fee. The mills are generally locally made, except for the motors and engine. These mills are often of poor design and can therefore only produce "whole grain" nutritious maize flour, often referred to as "No.2". Daily production levels vary depending on the consistency of power supply, type of machines and maize grains used.

Processing costs range from Shs 50 to 100 per kg, depending on the location. The "No. 2" maize flour is common in the rural areas (a function of processing availability rather than consumer preference) and its price ranges from Shs 600 to Shs 800 per kg. This study found that its price was higher in the border areas and in urban centres and commercial centres.

The medium-scale processors are based main in town centres – the district capitals and offer both contract and trade-based milling services to institutions and urban traders. The medium-scale millers first hull the maize to remove bran and then produce "No.1" flour, which is not very nutritious. Maize bran is sold to poultry and livestock farmers, while the "No. 1" flour is mainly bought by urban households. Medium scale millers do not produce "No. 2" maize flour because they are oriented towards the urban markets and the product specification of that market. These processors operate mills with capacities of up to 50 tonnes per day. Although they are involved in grain storage, the volumes handled are limited by storage space and working capital.

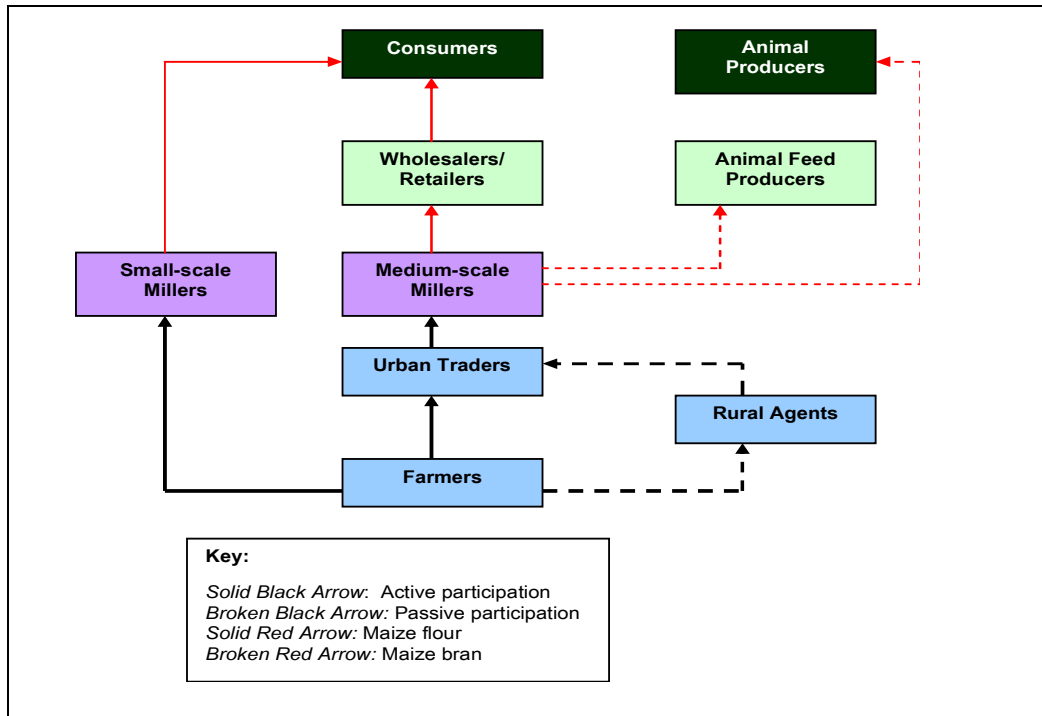
The medium-scale millers charge a price of Shs 70-100 per kg for milling. For every 100 kg of maize grain, about 70-73 kg of No.1 maize flour is produced. The millers sell the No. 1 flour at Shs 800 – 1,100 to wholesalers and retailers. The normal price of maize bran is Shs 100 per kg to poultry and animal farmers and manufacturers of feed meals. The medium-scale millers make a profit of Shs 87-383 per kg processed.

Large-scale processors are only found in Kampala. They buy their maize from urban traders and large-scale traders from the western, central and eastern regions. They sell more than three quarters (75%) of their maize products to the World Food Programme (WFP). The processors carry out activities such as cleaning, destoning, drying, fumigating and milling into flour.

Large Scale Traders/ Exporters

A number of large scale traders and exporters of maize have emerged over the years. The main ones include: (i) the World Food Programme, (ii) the Uganda Grain Traders (UGT), (iii) the Masindi Seed and Grain Growers Association (MSGGA), and (iv) the Uganda National Farmers Federation (UNFFE).

Figure 4.1: The Maize Supply Chain



5.3.2 Volume Flows and Value Changes

At the farm, profit margins vary depending on the maize variety and marketable quantities. Improved varieties with big seeds fetch higher prices compared to the local type. For example, in peak harvest a 100 kg sack of fresh maize with big seeds, mainly grown in Kapchorwa is sold at Shs100,000 (Shs 1,000 per kg), while the local variety goes for Sh750, 000 (or Shs 750 per kg) per sack of 100 kg. At low costs of production, farmers fetch positive profit margins of Shs 300 – 400 per kg of maize sold.

The main clients for fresh maize are market vendors who cook it or roast it for sale. Large and medium farmers add value to maize by drying and selling it as grains. A 100 kg bag of dried maize grain is sold at Sh50, 000 – 65,000, mainly to rural agents/village stores.

Participants	Cost Items	Prices (Shs)	
		Minimum	Maximum

1. Rural Agents	1. Purchase of 1 kg of maize grain	300	350
	2. Transport and cost of sack	35-40	35-40
	3. Rural agent commission	5-10	5-10
	4. Total cost per kg	340-350	390-400
	5. Selling price per kg	380-400	380-400
	6. Profit per kg	30-60	(20)-10
2. Urban Traders	1. Cost of 1 kg of maize	400	1,300
	2. Milling per kg	50-100	50-100
	3. Total cost per kg	430-480	450-500
	4. Selling price per kg of No.2	600-1,000	600-1,000
	5. Profit per kg	270-520	150-500
3. Small-Scale Millers	1. Cost of 1 kg of maize	380	400
	2. Milling costs	70-100	70-100
	3. Total costs for 1 kg maize grain	450-480	470-500
	4. Equivalent selling price of No. 1 flour produced (70% -73%)	560-803	560-803
	5. Price of maize bran	27-30	27-30
	6. Total price for No. 1 and Bran from 1 kg of maize grain	587-833	587-833
	7. Profit margin per kg of maize grain	107-383	87-363

5.4 CONSTRAINTS AND OPPORTUNITIES

- Cost and availability of inputs:** All the maize-producing areas suffer from the high cost of basic inputs – fertilisers, pesticides, herbicides, etc and machinery. Most of these inputs are sold at about three times the CIF-Kampala price. As a result, most farmers grow their maize without any application of fertilisers and herbicides. The control of weeds has been extremely poor, especially where large areas (acreage) have been planted with maize, which does not allow the farmers to exploit the full potential of the varieties. Moreover, the farmers (who do use them) do not get the inputs at the right time and they have to travel long distances to get them. Most suppliers are located in district urban centres far away from the farmers.
- Lack of appropriate extension services:** The lack of appropriate varieties of maize and inputs is compounded by ineffective extension services. It will be recalled that farmers’ production practices are generally poor. This is demonstrated by the low plant populations, poor harvesting, drying and storage of maize grain, leading to large losses due to pests and diseases. The overall poor

management and storage practices have contributed to low outputs and less than ideal quality. The extension field personnel are inadequate in number, lack up-to-date skills, lack logistics and equipment, etc.

- **Lack of credit services:** Maize is grown predominantly by small-scale farmers. For many years, these farmers have complained about the limited agricultural credit facilities for purchasing inputs and equipment.
- **Inefficient marketing system:** The marketing of crops in Uganda is a major constraint to improving the country's agriculture sector. Poor producer prices, poor market access, lack of market information and uncertainty of prices tend to militate against the small-scale farmers' efforts and interest in the market economy. The traders tend to be more speculative, seeking to maximise the margin between the farm gate and the market prices. Similarly, the private buyers (traders) are also confronted with problems such as poor storage, inadequate financial resources, lack of transport, etc. Access to production areas has often been extremely difficult due to poor roads. As a result, often there is a sizable stock of the previous harvest left with farmers. Due to poor storage, the quality of grains tends to deteriorate, leading to low farm incomes.

5.5 END-MARKET ANALYSIS

The term end-market as used in this report indicates where the final transaction takes place in the value chain. Typically, it is where the end user of the product is located, meaning the individual or organisation for whom the product has been created. The analysis of the end-market in this section identifies the key trends affecting the maize sub-sector, articulates the view points of the buyers and experts with regard to the strengths, weaknesses, opportunities and threats in the maize sub-sector, and examines the buyer preferences.

5.5.1 Key Trends in the Maize Sub-sector

A number of important trends can be seen in the maize sub-sector as discussed below. They include:

- **Increase in maize output:** Over the last few years there has been an increase in the production of maize, largely attributed to an increase in the acreage planted. This has been the case particularly in the maize-growing areas, such as Kamwenge, Masindi, Hoima, Iganga, etc, where farmers have 10 acres or more under maize. The rise in the interest in growing maize has been triggered by market signals that followed the liberalisation of the sector. On the other hand, the overall trend in production and area planted in recent years also suggest that yield has stagnated or even declined. The main reasons for this are extensive use of low quality seeds, depletion of soil fertility, erratic rainfall, prevalence of pests and diseases, low levels of such inputs as fertilisers and other agro-chemicals, and application of a generally archaic production technology.

- **Increase in demand for maize:** There has been a remarkable increase in regional demand for Ugandan maize over the past years. This has been particularly true following the normalisation and return to normalcy of the political situation in Southern Sudan, Congo (Democratic Republic) and Northern Uganda after cessation of hostilities by the belligerents. Uganda has exported large amounts of maize to these regional markets. And in this regard, the value of informal exports is even higher than the official export figures. Overall, therefore, Uganda is likely to remain an important source of maize for the region due to its close proximity to the areas of demand.
- **Adoption of improved maize varieties:** There are a number of programmes and organisations promoting maize production as a package of improved seeds and fertilisers. As a result, maize production has spread to all zones of Uganda, including the lake-shore banana/coffee farming belt, where it is reportedly replacing some traditional perennial crops. In spite of this, however, the overwhelming proportion of the area planted is taken up by the local varieties (unimproved) of maize, leading to low yields. Moreover, there is still little or no use of fertilisers (organic or inorganic) among the farmers – even among those adopting the improved varieties.
- **Weak input markets:** The input markets for improved maize seeds and fertilisers face a wide range of constraints. These include high costs and limited availability (supply) of these inputs. In fact, the high cost of inputs is the main reason for their limited use. Due to low input utilisation and yields per unit (between 1.0 and 1.8 MT/h) Uganda’s average maize costs of production are high. As a result, farmers have to rely on “favourable” prices in order to make a profit.

5.5.2 SWOT Analysis: Views from the Market Place

A. Weaknesses

- **Lack of clear agricultural policy:** Though generally the GOU has been implementing private sector friendly policies, its specific policy on agriculture remains unclear. There are no known incentives for farmers to increase production and no attempts to ensure farmers receive an economic return for their efforts. This results in wildly fluctuating prices and exploitation by unscrupulous traders and middlemen. This phenomenon can be a disincentive to expansion of production. Moreover, many smallholders do not own their land outright and cannot use it to secure loans from banks. Although a new land law to confer some rights to tenants was passed recently, there is still opposition to it by land owners and its effective implementation is in the balance.
- **Low level technologies:** Uganda continues to produce using mostly low level technologies. The inefficient hand hoe remains the main tool for most smallholder farmers. Although there is an active maize research programme and many improved seed varieties are on the market, most small farmers cannot afford them and use retained seed from the previous harvest. Smallholder farmers, who

produce the bulk of the maize crop, do not apply inputs for soil fertility improvement or for weed and pest control. This results into low yields, high losses to pests and disease and poor post-harvest handling.

- **Poor marketing and transport infrastructure:** When commodity markets were liberalised in the 1990s, an inexperienced and poorly resourced private sector stepped in to try and cope. Moreover, there is also a proliferation of middlemen who all eat into what would have been a margin for the farmer. These new entrants into the sector have yet to establish the kind of infrastructure that would encourage expansion in production and enhance efficiency in handling and marketing. There are no adequate storage facilities in the rural areas. The road network, especially the feeder roads, is in a poor state and render maize that more costly.

B. Opportunities

- **Deepening regional integration:** The countries of the EAC are moving toward the establishment of a common market thus creating a market of over 130 million consumers. If production could be stepped up and research prioritised, Uganda would be able to supply this market. Maize is a staple in much of the EAC region and the free trade which deeper integration promises could be taken advantage of by Uganda maize producers.

- **Growing urban population:** While maize is not a traditional staple food in Uganda, nonetheless, its consumption is growing especially among urban dwellers. The growing urbanisation in Uganda means that there will be growing base of people consuming *ugali* thus creating opportunities for expansion in maize cultivation and in milling capacity.

C. Threats

- **Strengthening Uganda Shilling:** For an economy trying to expand exports, a strengthening local currency is not a good thing. At the moment the Uganda Shilling has been rallying against the US dollar which undermines the profitability of exporter firms. (It is recognised that import based firms will take advantage of this development). In the long run, the currency threat lies in its fluctuations which will create uncertainty for business enterprises – both importers and exporters.

- **Scepticism about the EAC:** Some people in the private sector in some of the EAC Partner States (Uganda and Tanzania) are reportedly not as enthusiastic about deepening EAC integration as the political leadership. They have been calling for a slowdown in the integration process. If these voices succeed in persuading their respective leaderships to slow down then one of the positive attributes of Uganda as an investment destination will be jeopardized and opportunities to expand production will be lost.

- **Calls for protectionist policies:** In the wake of rising food prices and pockets of food shortages in Uganda there were calls for government to impose bans on exportation of food products. The progress Uganda has achieved on the economic front has been based on the pursuit by the GOU of liberal economic and trade policies. If these are curtailed, then progress will be slowed down.
- **Shifts to other crops:** Because of the low prices that farmers often receive for their crop, there has been a tendency in some traditional maize-growing areas to shift to newer and better paying crops such as wheat and rice. If this trend continues, local production will dwindle and national requirements will have to be met through imports. But worse still, those regional markets that have depended on Uganda for supplies would have to look elsewhere. The regional relief effort (WFP) would also suffer in such circumstances.

5.5.3 Buyer Preferences

On the domestic market maize is consumed either green or in the form of flour; the latter principally in two qualities – “No. 1” and “No. 2”. Green maize is mostly consumed on farm by the household with a small amount sold ready-to-eat either by hawkers or roadside roasters. Small quantities of stripped medium sized yellow fresh maize can be found in Kampala super markets packed usually in pairs, placed on shallow tray-like polystyrene containers and covered with thin sticky polythene film.

In respect of maize flour, “No. 2” – the lower grade variety – is ordinarily presented in 100 kg bags and sold to individual consumers in kilos. Such buyers are mostly the lower income urban dwellers. Institutional consumers (hospitals, schools, prisons etc.) are also important buyers of this grade. These buy in bulk – usually by the truck load. Our market survey covering Kampala groceries and super markets revealed that the local higher quality “No. 1” maize flour is presented in 5, 10, 15 and 25 kg multi-layer craft paper bags. The survey also showed that most consumers purchase the 5 and 10 kg packs. Some imported maize flour can also be found competing for shelf space with the local varieties.

6.0 THE WHEAT SUB-SECTOR

Wheat was first introduced in Uganda (on the slopes of Mt. Rwenzori) in 1912. Since then its cultivation has spread to other areas of the country, which are classified as “cool wet highlands”, at an altitude of 1,500 to 2,500 metres above sea level, with a mean maximum temperature below 26°C and annual average rainfall above 800 mm.

6.1 WHEAT PRODUCTION

Wheat has been grown in the highlands of Uganda for many decades, although it has not become a major contributor to food consumption in rural areas. Wheat production involves minimal land preparation with the hoe, broadcasting of local varieties (saved seed) and no weeding. Harvesting and threshing/winnowing are done manually and demand a high labour input. There are no fertilisers applied on any crop and wheat yields are estimated at 0.8 – 1.0 t/ha.

Overall production of wheat in Uganda is still low with acreage under the crop estimated as ranging from 9,000 hectares in 2004 and 2005; 10,000 ha in 2006 and 11,000 ha in both 2007 and 2008. The corresponding quantities produced were estimated at 15,000 tonnes in 2004 and 2005; 18,000 in 2006; and 19,000 in 2007 and 2008 (UBOS, 2009).

Table 6.1: Wheat Production in Uganda, 2004-2008

	2004	2005	2006	2007	2008
Area Planted (ha)	9,000	9,000	10,000	11,000	11,000
Quantity (MT)	15,000	15,000	18,000	19,000	19,000

Source: UBOS, Statistical Abstract 2009

As can be seen from Table 5.1 above, the quantity of wheat produced over the last four year has been increasing, albeit marginally. In 2004 – 2005, and 2007 – 2008, production stagnated at 15,000 MT and 19,000 per annum, respectively. There was also a marginal increase in the area planted, but the quantity produced did not rise significantly. This indicates the low yields per acre planted.

6.1.1 Main Wheat Growing Areas

The main wheat growing areas in Uganda are:

- the Southwest (Kabale, Kisoro and Rukungiri);
- the west (Kabarole, Kasese, Bushenyi, Mbarara, Kabale, Kisoro,) and
- the east (Mbale and Kapchorwa) and
- the West Nile/Nebbi region in north western Uganda (grown in small quantities).

Farmers in these areas have taken interest in wheat growing because it is well suited for the physical conditions of these highlands and it is relatively unaffected by pest and disease outbreaks. Most importantly, however, they have been encouraged by the market where prices are more stable compared to other commodities.

In the Southwest (Kabale, Kisoro and Rukungiri), wheat is grown on steep hills, albeit on small plots [0.1-0.2 ha] in rotation with field peas, sorghum, Irish potatoes, and beans.

In the west (Kabarole and Bundibugyo, Kasese, Bushenyi and Mbarara) wheat is planted after fallow, after slashing, burning and land preparation. It is normally rotated with beans, Irish potatoes and finger millet. Mechanised production of wheat was promoted by Virika Catholic Mission in the late 1980s and early 1990s at lower altitudes in Kabarole, but yields were so low the project was halted pending identification of suitable varieties. In Kasese, wheat growing is part of the traditional farming system and continues to be grown on commercial block farms of about 2 ha or on individual plots of up to 1 ha. Production from this area often lacks market outlets and is mostly consumed on the farm. The yields recorded in this region have been of the order of 500 to 700 kg per ha in the Kagando area and 1,500 – 1,900 kg in the Kyembogo area.

The Bushenyi/Mbarara belt the growing of wheat is mostly smallholder based. The main growing areas are Mwizi in Mbarara and Buhweju in Bushenyi district. Government introduced wheat in Buhweju in 1952. It was introduced into Mwizi in 1971 by immigrant farmers from Kabale. Production is mostly at the subsistence level. In the Kabale/Kisoro region too, wheat is mostly small holder based, usually intercropped with such other crops as maize and sorghum. There is very little use of such inputs as fertilisers or herbicides in both these growing areas.

In the East (Kapchorwa) wheat, is a major cash crop for smallholder farmers and accounts for a significant proportion of the cultivated farm area). It is grown on gently-to-moderately sloping land. Here the cropping pattern is dominated by maize, often intercropped with beans. Land is normally prepared by tractor or oxen. Wheat seed originating from improved Kenyan varieties is broadcast. There is little weeding although one round of herbicide is applied. Yields are relatively higher at 1 – 2 t/ha. Production in this area ranges from cultivation of small plots (0.5 ha) to fairly large production on farms as large as 300 ha. Even smallholder wheat farming in this region is more commercialized than in other areas. Fairly high outputs in this region have been achieved – up to 5 tonnes per ha with some of the high yielding varieties. There is well developed use of herbicides, fertiliser and other agricultural chemicals among producers in this area.

6.2 WHEAT CONSUMPTION

6.2.1 Domestic Consumption

The consumption of wheat and wheat products has been growing rapidly. In 1990, the African Development Bank (ADB) estimated consumption at 50,000 tonnes. According to the Food and Agricultural Organisation (FAO), only about half of production ends up at the millers, with 11% lost after harvest, a similar amount consumed on the farm, while the rest is exported³ to neighbouring countries.

Of the amount produced, an estimated 20% is consumed on the farm. This does not include saved seed, which is broadcast at the rate of about 110 kg/acre. A sizable proportion of the production is transported to Kenya, mainly because prices there are usually higher. It is estimated that an average of about 1,700 MT are available for commercial purposes, 1,000 probably goes to Kenya. Given the low estimated production, the bulk of domestic consumption needs are met from imports (Table 6.2).

Table 6.2: Wheat Consumption 2004 – 2008 (Tonnes)

	2004	2005	2006	2007	2008
Production (MT)	15,000	15,000	18,000	19,000	19,000
Add Imports	236,023	325,533	349,271	331,384	264,298
Less Exports/Re-exports	291	23	2,420	1,393	1,454
Domestic Consumption	250,732	340,510	364,851	348,991	281,844

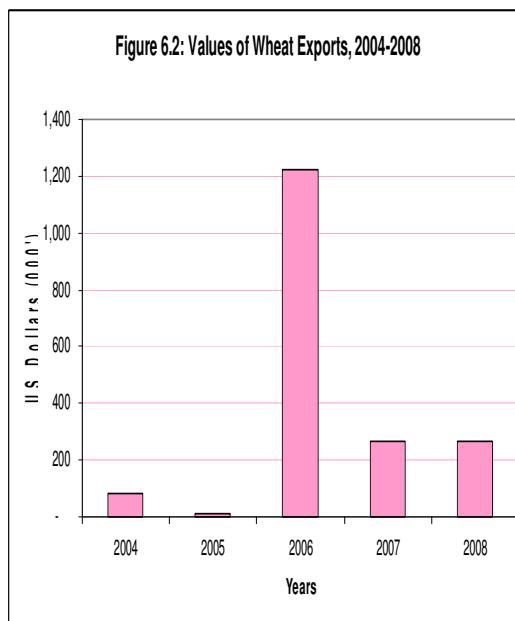
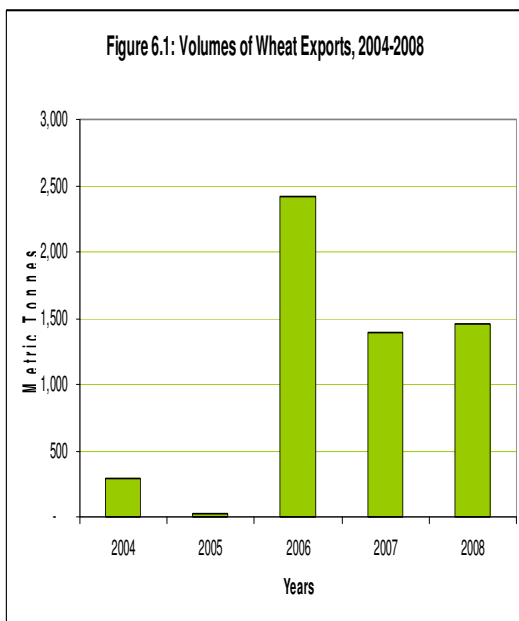
Source: UBOS and URA

6.2.2 Wheat Trade

A. Wheat Exports

Most of the wheat produced in Uganda is consumed domestically. Although there may be some informal export to neighbouring countries, this is not statistically significant and is not even captured in the UBOS survey of informal trade carried out in 2008. However, small URA reports some exports of wheat grain as reflected table above and in Figures 6.1 and 6.2 below. Flour exports to Southern Sudan and the DRC also occur, but they are usually informal and difficult to quantify. Figures 6.1 and 6.2 below show the volumes and values of wheat exports in 2004-2008.

³ These exports are not reported in the formal trade statistics, but there is a history informal cross-border exchange of goods between Uganda and its neighbours.

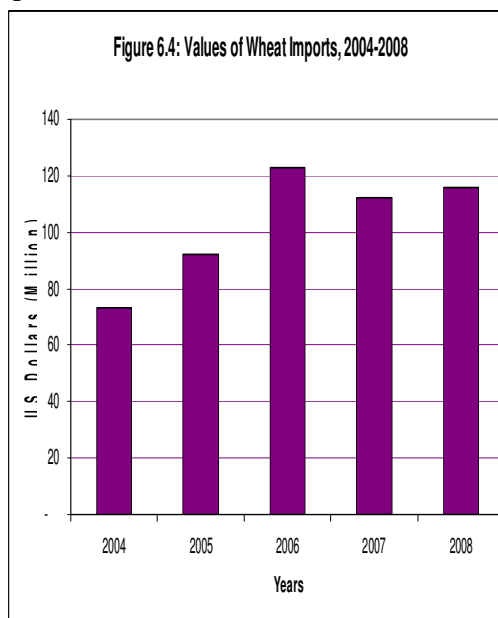
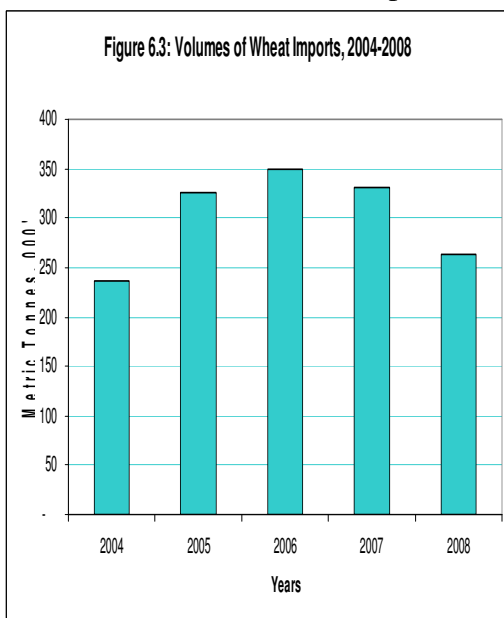


Source: Uganda Revenue Authority

As Figure 6.1 above demonstrates, exports of wheat have been very marginal. Only in 2006 did the country export about 2,400 MT, but it declined to 1,393 MT in 2007.

B. Wheat Imports

Uganda imports small amounts from the US (Monetized wheat under PL 480, Title II (HRW), Australia, Argentina, Pakistan, and Turkey. Small quantities of flour are also imported from Germany by bakeries as well as from Kenya. Figures 6.3 and 6.4 show the wheat imports for the period 2004 – 2008.



Source: Uganda Revenue Authority

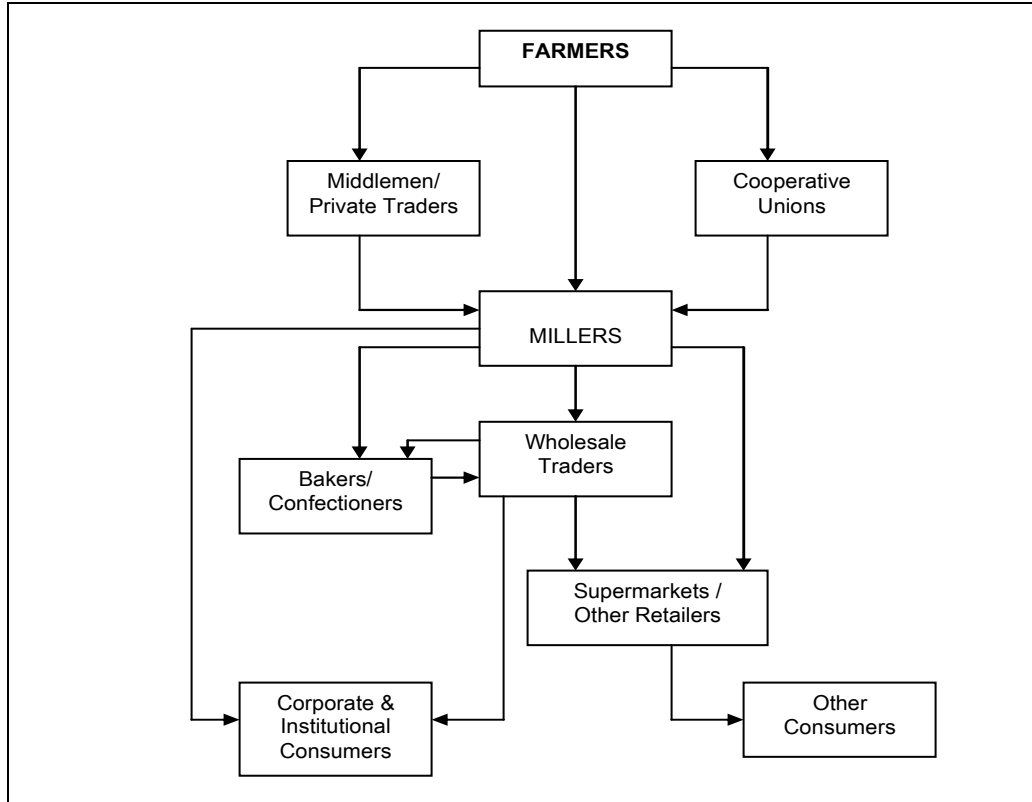
6.3 VALUE CHAIN MAPPING

6.3.1 Functions Matrix

Farmers sell their crop to cooperatives (Kabale/Kisoro and Mt. Elgon) to private traders or directly to millers. The bulk of locally grown wheat is marketed through the cooperative unions. In some cases, procurement is linked to previously extended credits and services. For example, in the Mt. Elgon area, the majority of farmers sell to the Sebei-Elgon Cooperative Union directly or through primary cooperative societies. In Bushenyi/Mbarara and Kabarole regions, the common practice is to sell directly to millers. In Kabale/Kisoro, farmers who have any surpluses usually sell it to the Kigezi Growers Cooperative Union.

The initial buyers (non-millers) then sell to millers who mill and sell flour to wholesalers, large retailers such as supermarket chains, to bakeries and to some institutional consumers. The supermarkets and wholesalers sell to final individual and institutional consumers. The bakers and confectioners make bread, cakes and other pastries which they sell to individual as well as corporate and other large consumers. These relationships are represented by the figure below.

Figure 6.3: The Wheat Value Chain



6.4 CONSTRAINTS AND OPPORTUNITIES

- Poor infrastructure:** In Uganda wheat is mainly grown in Kapchorwa and Kabale. These two areas are characterized by a very poor road infrastructure. Although the road network has improved considerably over the past decade, feeder roads remain in poor condition and serve as a major bottleneck in the movement of produce. During the rainy season roads become impassable reducing access to markets and other social services. Kapchorwa, for example, is typically a hilly landscape with poor roads that pose a danger to people and animals in movement and transportation of commodities.

- Soil erosion:** The hilly terrain in Kapchorwa and Kabale (indeed in most growing areas), combined with poor soils, makes the areas susceptible to soil erosion and flooding during the rainy season and soil degradation due to wind gusts in the dry months of January and February. According to the women farmers talked to by this study, soil erosion is a seasonal issue especially in the months of July when rain is heavy. Floods at times wash away fields and homes in lower grounds. During the recent dry spell, the winds destructed a number of farms. Some people have tried to control this by planting grasses and cultivating along contours.

- Financial services:** Farmers have very little working capital to purchase

yield-enhancing inputs. There is no operational bank in rural areas and commercial banks prefer lending to big traders. Currently, the availability of credit to finance working capital is limited to small amounts made available under micro finance schemes and rotating associations. Even if farmers could afford the inputs, their availability is problematic because domestic production has either ceased (fertilizers) or is inadequate (seed) and there is no guarantee of their quality.

- **Marketing constraints:** The marketing of surplus produce over household consumption is both difficult and expensive. While rural markets are oversupplied with perishable commodities, access to urban and external markets is limited by inadequate infrastructure, the poor state of the marketing and processing sector and the numerous unofficial taxes levied at regular intervals in the marketing chain and at the borders. Many large processing plants are either closed or operating at very low levels. This is further worsened by the absence of market information, which in most cases results in the selling of grain at a price below the production costs.

- **Inadequate market information especially for exports:** In general, market information flow is weak and skewed away from the farmers, resulting in their poor bargaining power. Even where the farmers have or can access information, there is a tendency to sell individually at the peak harvest season which reduces their power to bargain for better prices on larger volumes of sale. In addition, there are no guidelines on export market requirements and information on where and how to export wheat (market location). Small scale farmers face difficulties in accessing the international markets due to standards requirements, such as Sanitary and Phytosanitary (SPS) requirements. Because of this, farmers and traders are exploited by export agents who pay them low prices for their commodities. This undermines exchange and the harnessing existing and new market opportunity.

- **Road delays:** Delays are caused by the poor state of the road network, which results in high costs of transporting agricultural commodities to key markets. Delays are also caused by various inspections which include inspection of commercial vehicles, quality inspections (including of products certified by accredited laboratories and of imports originating from the EAC bearing certification marks issued by the three East African Standards Bureaus), testing procedures and varying procedures for issuing certification marks, and transiting procedures, including other transport procedures for transit traffic. These result into wastage, and high transport costs.

6.5 END MARKET ANALYSIS

6.5.1 Key Trends in the Wheat Sub-sector

- **Stagnant production:** Annual production of wheat in Uganda has remained below 20,000 MT for the past few years and is not expected to increase much in

the immediate future. The main reason is the limited areas suitable for the crop which thrives in the higher locations in Uganda that best imitate a temperate climate. Even in these areas, the crop is susceptible to leaf rust which results in considerable losses. Because wheat is still a fringe crop, GoU does not prioritise research into the crop that might have resulted in availability of more suitable varieties and an increase in yield.

- **Growing Demand:** On the demand side, there is evidence that more and more people are consuming wheat products – bread, cakes, etc. This is fuelled mostly by growth in urban populations, but also by pockets of increase in GDP per capita since the late 1990s. This growing demand is being met overwhelmingly by importation. In 2004 – 2008, for example, 95% of the country’s requirements were met by imports. Much of this imported wheat is used in bakeries, biscuit factories and other confectioneries.

6.5.2 SWOT Analysis: Views from the Market Place

A. Strengths

Political Stability and favourable business environment: For the past 20 years or so, the country has experienced a remarkable level of political stability and favourable economic policies which have engendered steady growth in the economy and confidence in the country’s nascent private sector.

Central geographical location: Although Uganda is land locked, its location in the middle of the Great Lakes region places it in a unique position to serve markets in the isolated eastern DRC, Southern Sudan and Burundi and Rwanda. Markets in western Kenya as well as parts of northern Tanzania are also easily accessed from Uganda.

B. Weaknesses

An unclear agricultural policy: While the GOU has been implementing private sector friendly policies, its specific policy on agriculture remains unclear. There are no known incentives for farmers to increase production and no attempts to ensure the farmers receive an economic return for their effort. This results in wildly fluctuating prices and exploitation by unscrupulous traders and middlemen. This situation can be a disincentive to expand production. Moreover, many smallholders do not own their land outright and cannot use it to secure production credits from banks. Although a new land law has been passed recently that would confer some rights to tenants on land, there is still opposition to the law by land owners and its effective implementation is in the balance.

Low level technologies: Uganda continues to produce using mostly low level technologies. Research in wheat has not been prioritised and therefore there are no home-grown improved seed for replanting. As we have seen, in some areas, seed is broadcast in the traditional manner meaning that mechanised weed control

and harvesting is impossible. Further, because agricultural chemicals are expensive, they are not used enough. This low technology leads to *low yields, high losses* to pests and disease and to poor post-harvest handling.

Poor marketing and transport infrastructure: Following the liberalisation of commodity marketing in the 1990s, an inexperienced and poorly resourced private sector stepped in to try and cope. The new entrants into the sector have yet to establish the kind of infrastructure that would encourage expansion in production. There are no adequate on-farm stores, and certainly no rural warehouses. The road network especially the feeder roads are in a bad state and render produce that more costly.

C. Opportunities

Deepening regional integration: The countries of the EAC are moving toward the establishment of a common market thus creating a market of over 100 million consumers. Uganda is well placed if production could be stepped up and research prioritised, to supply this market.

Growing urban population: The consumption of wheat based products is associated more with urban dwellers that on balance have more disposable income. The growing urbanisation in Uganda means that there will be growing demand for wheat based products such as bread, pastas and others. This will open up opportunities also for investment in the manufacture of value added wheat products.

D. Threats

Strengthening Uganda Shilling: For an economy trying to expand exports, a strengthening local currency is not a good thing. At the moment the Uganda Shilling has been rallying against the US dollar which undermines the profitability of exporter firms. (It is recognised that import based firms will take advantage of this development). In the longer run, the currency threat lies in its fluctuations which create uncertainty for business enterprises – both importers and exporters.

Stagnant acreage and production: Though Uganda has some of the most fertile soils coupled with reasonably reliable and adequate rainfall, the areas where wheat can thrive area limited and acreage under wheat is relatively small and is stagnant. Moreover there is limited scope for diversifying locations for growing the crop. This therefore means that the country's growing demand for wheat will continue to be met by importation.

Scepticism about the EAC: Some people in the private sector in Uganda and in Tanzania are reportedly not as enthusiastic about deepening EAC integration as the political leadership. They have been calling for a slow down in that process. If

these voices succeed in persuading their respective leaderships to slow down then one of the positive attributes of Uganda as an investment destination will be jeopardized and opportunities to expand production will be less.

Calls for protectionist policies: in the wake of rising food prices and pockets of food shortages in Uganda there were calls for government to impose bans on exportation of food products. The progress Uganda has achieved on the economic front has been based on its government's pursuit of liberal economic and trade policies. If these are curtailed, then progress will be slowed down.

6.5.3 Buyer Preferences

There are two principal consumers of wheat flour – individual households and bakeries and confectioners. For individual consumers, wheat flour is presented mostly in 1 or 2 kg packs. There are also two varieties – whole grain

7.0 THE RICE SUB-SECTOR

7.1 RICE PRODUCTION

Rice production in Uganda started in 1942 mainly to feed the World War II soldiers. However, due to a number of constraints, production remained minimal until 1974, when farmers appealed to the government for assistance. In response, Government identified the Doho swamps and constructed the *Doho Rice Irrigation Scheme (DRS)* with the help of Chinese experts and later *Kibimba Rice Scheme*. Both schemes, which were based on modern technologies (irrigation and water works), changed the agronomic practices of the people and the productivity of the area.

Although rice production was recently introduced in the country, many farmers are not familiar with its cultivation or the required agronomical practices. About 80% of the rice produced in Uganda, is grown by small-scale farmers with acreage of less than 2 ha, using simple technologies and little or no application of fertilizer, poor quality seed, with little or no irrigation and poor water management practices among others. About 15 % of the growers are medium-scale farmers with acreages of 2 – 6 ha, applying more or less same practices as the small-scale farmers with a few using non-motorized tools such as line markers. The major difference between the medium- and small-scale farmers is the acreage. There is also a small group of large-scale farmers (about 5%), with land under cultivation ranging from 6 to 1,000 hectares.

Total rice production is currently estimated at 165,000 MT (MAAIF, 2009). Uganda's rice production has increased significantly over the last five years. By some accounts it has doubled and is expected to more than double again by 2011, because of the new varieties which can be grown in rain-fed land, not just the swampy paddies that dominate world production today. Table 6.1 shows Uganda's rice production in 2004 – 2008.

Table 7.1: Uganda's Rice Production in 2004 – 2008

Rice	2004	2005	2006	2007	2008
Area planted (Ha)	93	102	113	119	128
Production (Qty)	121,000	153,000	154,000	162,000	171,000

Source: UBOS, 2009

Uganda adopted the *New Rice for Africa (NERICA)* 1, 4 and 10 varieties⁴ locally known as “Upland Rice” in addition to the old lowland varieties. From the earlier releases of three upland rice varieties in Uganda in 2002, farmers were able to earn about US\$9 million in 2005. In the process, the country has seen rice imports drop between 2005 and 2008. The introduction of NERICA in Uganda is one of the Government’s strategies for poverty reduction and achieving food security. The USAID (through the Agricultural Productivity Enhancement Programme [APEP]) and the Japanese Government through the SESA KAWA and the Japanese International Cooperation Agency (JICA) have done a lot of work to coordinate the growing of rice in Uganda (USAID, 2008). In addition, the involvement of the Vice President of Uganda in the promotion of the growing of upland rice has led to an increase in the number of rice farmers – from 4,000 in 2004 to 45,000 in 2008, with over 50,000 acres under rice cultivation.

7.1.1 Main Rice Growing Areas

Most rice in Uganda is grown in Eastern Uganda, followed by Western Uganda due to the presence of lowland with high moisture content throughout the growing season. The main producer in the eastern part of the country is a private company – Tilda – at the Kibimba Rice Scheme, growing the *Tilda* rice brand. The company currently produces 20,000 metric tonnes of rice per year, accounting for about 20% of total rice production in the country. Since 2004, rice output has more than doubled every year and was expected to reach 180,000 metric tonnes by end of 2009, up from 135,000 metric tonnes in 2006. Consumption of imported rice, meanwhile, has fallen by half every year since 2004. Uganda partly owes the recent boom in rice production to the resurgence of Kibimba Rice Scheme and the government’s effort to promote rice growing among smallholder farmers who account for more than 80% of the total rice production.

Government recently demarcated the country into agricultural zones, each with its specific production characteristics. The objective of zoning was to ensure that each one of the zones undertakes a set of agricultural enterprises, where it has a comparative advantage. It has emerged that rice has become one of the major crops grown in many of these zones.

7.2 RICE CONSUMPTION

7.2.1 Domestic Consumption

⁴ NERICA was developed in 2002 by the West African Rice Development Authority (WARDA) as a blend of African and Indian varieties. NERICA combines the high yield of Asian rice with the hardiness and drought resistance of African rice varieties. One kilogram of seed produces 50 kilograms of seed in one season. Within a year a farmer can then harvest three tons of rice. It is this potential that has seen the number of rice farmers in Uganda

Demand for rice in Uganda has increased dramatically since 2001, standing at over 225,000 MT of which only 165,000 MT are locally produced creating a deficit of 60,000 MT. While production in the country has increased, there remains a significant imbalance. Consumption per capita is about 8 kg, with consumers preferring the aromatic to non-aromatic rice, sticky to non-sticky, unbroken to broken and bulging after cooking to rice that does not bulge, white milled rice to brown.

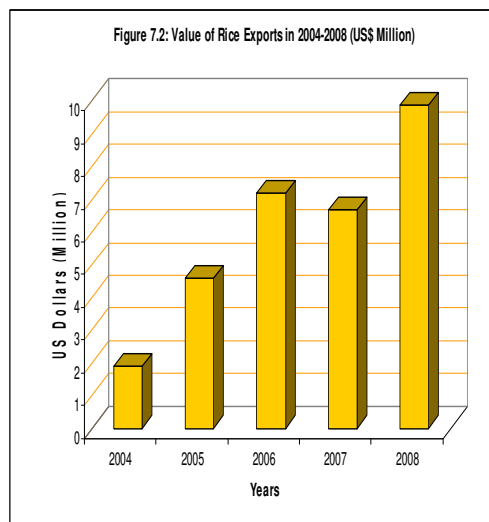
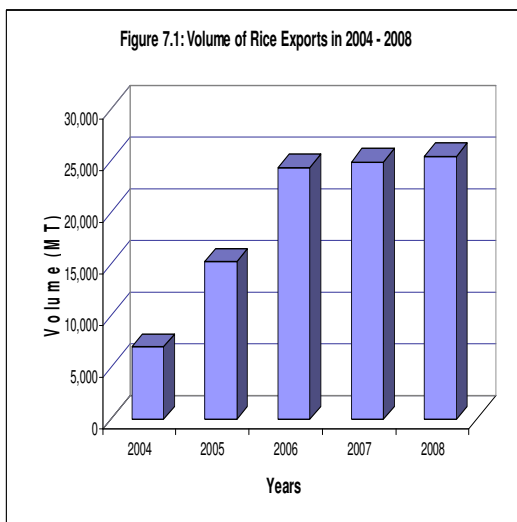
Because of its wide popularity as a food item, rice is among the most liquid of all crop assets in Uganda. In fact, rice consumption in Uganda – as elsewhere in Africa – has a high income elasticity, and increases in projected demand are closely linked to increased urbanisation and economic growth. These patterns are evident in most parts of Uganda where pockets of economic growth have fuelled an increase in demand for rice.

Uganda’s total population now stands at over 30 million with annual growth rate of 3.2%. This means that the demand for rice can only increase.

7.2.2 Rice Trade

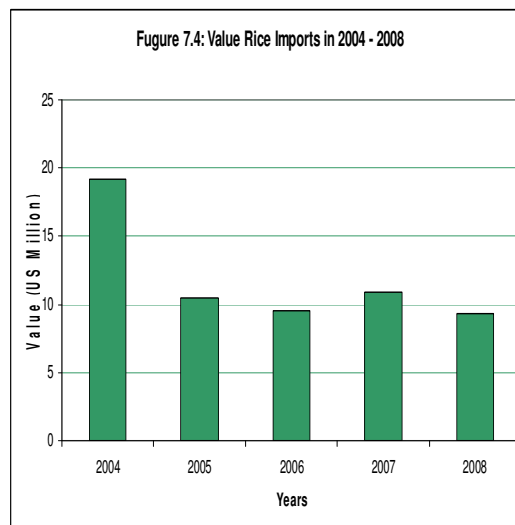
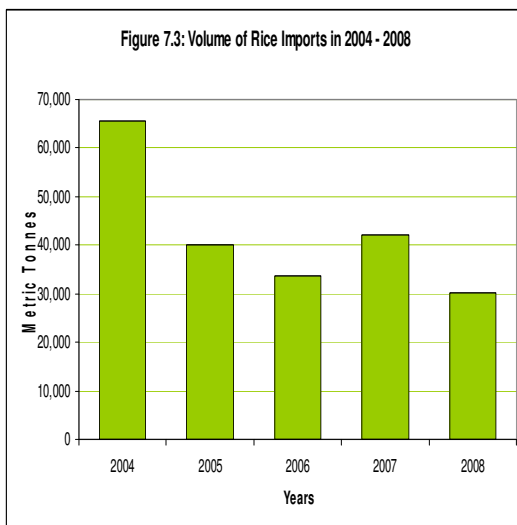
A. Rice Exports

Exports of Ugandan rice are quite negligible and where they exist in the national trade data, they are mainly re-exports. However, as can be seen from Figures 7.1 and 7.2 below, exports of rice have been on the increase, especially in the period 2006-2008. The main destinations of these exports are Rwanda, Kenya, DRC and Southern Sudan.



B. Rice Imports

Over 30% of the rice consumed in Uganda is imported. However, as can be seen from Figures 7.3 and 7.4 below rice imports into Uganda have been declining, from 65,779 MT in 2004 to 30,114 in 2008. Moreover, it would appear that most of this rice is re-exported because as Figures 7.1 and 7.2 above show, rice exports have been on the rise.



7.3 VALUE CHAIN MAPPING

7.3.1 Functions Matrix

Farmers: Most farmers plant 1-2 acres of rice, and sell their unshelled rice to rural traders or to agents, who collect it from farms. Rural farmers and some farmer groups with large stocks transport the rice to millers and mill it before it is sold. Sale at the farm gate is often dictated by the immediate needs of the family and the need to avoid the relatively high costs of transport to the milling centres.

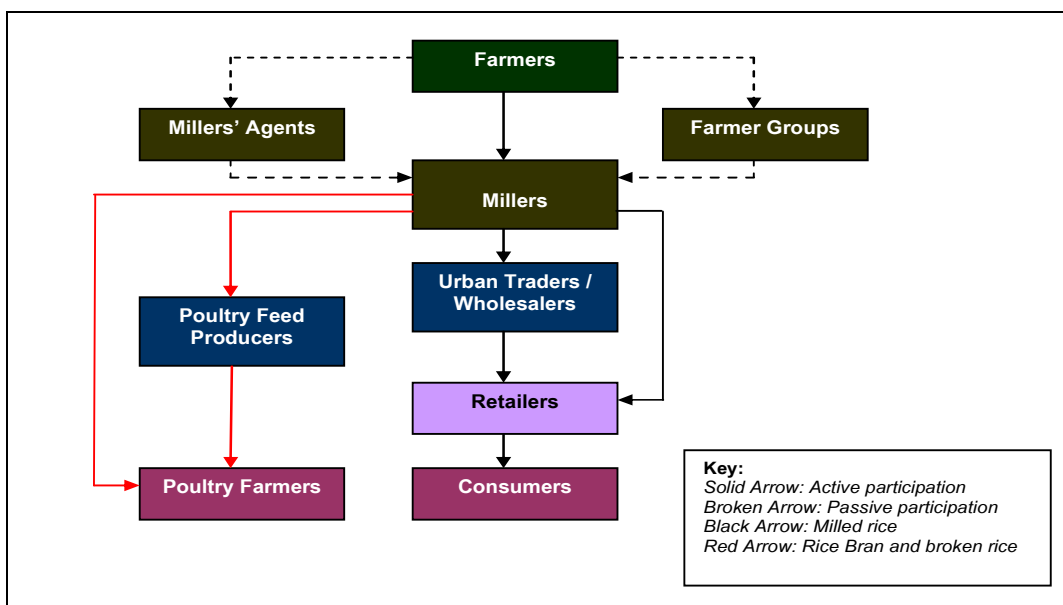
Rural agents: Rural agents handle most of the rice traded in the rural areas. Their functions are similar to those of the maize agents. The difference, however, is that they supply to the farmers free of charge, the gunny bags provided by the millers, and advise the rice millers when there is sufficient rice so that the latter can provide transportation. The rural agents make a profit of Shs 5-10 on every kilogram of rice assembled. The profit margin is a function of demand for, and supply of, rice in the market.

Millers: Rice millers are located mostly in urban centres and some few trading centres in the districts. Majority of them produce a single grade type of rice, which is polished whole grains mixed with broken ones and stones. The mills act as marketing centres, where farmers, rural traders, millers and urban traders transact deals. Large-scale farmers, farmer groups and millers sell assembled rice

to urban traders and wholesalers. In order to attract business, millers normally supply gunny bags and provide transport to farmers to bring rice to their facilities. Some millers also assist the farmers to open up and clear their land. Some large-scale farmers absorb transport costs to milling centres.

Urban traders: Urban traders are primarily wholesalers and importers, who either purchase hulled rice from the millers and farmers or import it from other countries. Urban traders are located in Kampala and other major towns, Jinja, Mbale, Gulu, Lira, etc. They usually clean, consolidate and bulk the rice. Much of this rice is sold to other traders, including those from Southern Sudan and the rest is taken to Kampala.

Figure 6.1: The Rice Supply Chain in Uganda



7.3.2 Volume Flows and Value Changes

Most farmers sell their unshelled rice to rural traders or agents who collect it from their farms. Rural farmers and a few farmer groups with large holdings transport the rice to millers and mill it prior to sale. The farm gate price per kg of paddy rice is US\$ 800 – 1,000 depending on the time of the sale and the rice variety.

The rural agents make US\$ 5 – 10 per kg of rice assembled. The variety of rice determines the price and profitability levels other factors held constant.

7.4 CONSTRAINTS AND OPPORTUNITIES

Production lagging behind demand: Rice production in Uganda has not kept pace with demand, which is being driven by the high population growth, urbanisation, and rising incomes. This has created a food security situation for consumers and a market opportunity for producers. Although the recently

introduced upland rice is taking root, it is still not sufficient to meet local demand and output is on account of increase in acreage rather than productivity.

Input supply systems not developed: Input supply is crucial to improvements in productivity (including increased volumes and improved quality) that would bring about the transition of farmers from subsistence to commercial agriculture. Input supply systems in Uganda are not efficiently developed, as a result of which smallholder rice farmers lack regular access to competitively priced quality inputs on a timely basis and to the knowledge needed to apply them for the best results.

Poor processing capacity: Processing is important for getting a quality product, which can compete with imported rice. Uganda does not have a well-developed processing infrastructure. The result is that the quality of rice processed by Ugandan millers often is of lower quality.

Quality: Ugandan rice is challenged by quality benchmarks. The locally produced rice is characterised by lack of cleanliness and homogeneity of the product. Such negative characteristics, compromise the competitive potential that could be derived from positive characteristics such as freshness.

7.5 END MARKET ANALYSIS

7.5.1 Key Trends in the Rice Sub-sector

- **Growing production:** Rice growing by smallholders has been increasing. At the same time the privatisation of the formerly GOU ran Kibimba Rice Scheme (producers of the *Tilda* brand) has seen the scheme's production increase and stabilise at the current 20,000 MT p.a. The government *Prosperity-for-All* strategy has resulted in a marked increase in the number of farmers growing the upland variety to 8,000 and still growing. Since 2004, local production has doubled every year and will likely top 180,000 MT in 2009. Given that rice is currently the most liquid of all agricultural commodities, production is expected to continue rising for some time.
- **Growing demand:** Rice consumption is growing as evidenced by growing local production and continued, if declining importation. As in the case of wheat and maize, this higher demand is being fuelled by a growing overall population and particularly in the urban areas. Also contributing to this growth in demand is the steady though modest rise in incomes.
- **Declining imports:** Available data show a steady decline in imports from 65,000 MT in 2004 to 30,000 MT in 2008. This is partly due to a high import tariff but also due to efforts to increase local production. This declining trend is expected to continue as local production increases.
- **Rising exports:** There has at the same time been a visible rise in the level of exports, though much of this is thought to be re-exports. However, the quantity

exported has stagnated somewhat at around 23,000 – 24,000 MT since 2006. The opening up of the South Sudan has been a contributory factor. If stability in that country continues, then there is scope for increased exports there given the steady rise in Uganda's production.

7.5.2 SWOT Analysis: Views from the Market Place

A. Strengths

Fertile soils and introduction of upland rice: Uganda is endowed with extensive arable lands that are very fertile. In addition, the rains have continued to be adequate and generally reliable in most areas of the country. The country has taken advantage of these attributes to introduce and vigorously promote upland rice varieties in almost all parts of the country.

Political Stability and favourable business environment: For the past 20 years or so, the country has experienced a remarkable level of political stability and favourable economic policies which have engendered steady growth in the economy and confidence in the country's nascent private sector. This augurs well for the continued expansion in production and also in regional and international trade in rice.

Central geographical location: Uganda may be land locked, but its location in the middle of the Great Lakes region places it in a unique position to service markets in the isolated eastern DRC, Southern Sudan and Burundi and Rwanda. Markets in western Kenya as well as parts of northern Tanzania are also easily accessed from Uganda. With the country expected to continue expanding production, it is ideally placed to sell to those markets.

B. Weaknesses

An unclear agricultural policy: Though generally GOU has been implementing private sector friendly policies, its specific policy on agriculture remains unclear. There are no known incentives for farmers to increase production and no attempts to ensure the farmers receive an economic return for their effort. This results in wildly fluctuating prices and exploitation by unscrupulous traders and middlemen. These phenomena can be a disincentive to expand production. Moreover, many smallholders do not own their land outright and cannot use it to secure production credits from banks. Although a new land law has been passed recently that would confer some rights to tenants on land, there is still opposition to the law by land owners and its effective implementation is in the balance.

Low level technologies: Uganda continues to produce using mostly low level technologies with the exception of the Kibimba Rice Scheme which employs mechanisation and first class processing and packaging facilities. But this is responsible for only about 20% of current production. Further, because agricultural chemicals are expensive, they are not used enough by smallholders.

This low technology leads to *low yields, high losses* to pests and disease and to poor post-harvest handling.

Poor marketing and transport infrastructure: When commodity marketing was liberalised in the 1990s, an inexperienced and poorly resourced private sector stepped in to try and cope. These new entrants into the sector have yet to establish the kind of infrastructure that would encourage efficient marketing. There are no adequate on-farm stores, and there are no rural warehouses. The road network, especially the feeder roads, is in a bad state and renders produce more costly.

C. Opportunities

Deepening regional integration: The EAC regional block is a market of over 100 million consumers. Uganda is well placed if production continues to expand, to supply this market. The country is equally well placed to be an important re-export base for imported varieties of rice.

Growing urban population: Rice is not a traditional staple for the majority of the population in Uganda and its consumption is associated more with urban dwellers that on balance have more disposable income. The growing urbanisation in Uganda means that there will be growing demand for a diet that includes rice.

D. Threats

Strengthening Uganda Shilling: For an economy trying to expand exports, a strengthening local currency is not ideal. At the moment the Uganda Shilling has been rallying against the US dollar which undermines the profitability of exporter firms. (It is recognised that import based firms will take advantage of this development). In the longer run, the currency threat lies in its fluctuations which create uncertainty for business enterprises – both importers and exporters.

Possible over production: Uganda has prioritised rice growing as a poverty reduction crop. New varieties have been introduced. The Vice-President of the country has been on a well publicised campaign to encourage rice growing throughout the country and the response is good – production has been growing. The down side to this is that a point may be reached soon at which prices might start falling with the consequence that farmers will have no more incentive to grow the crop.

The rice importing lobby: Uganda has a strong rice-importing lobby group, operating under the Kampala City Traders Association (KACITA). This group often has views that are detrimental to measures that aim at expansion in local rice production. This group was especially vocal in opposing the imposition of a special import levy on rice.

Scepticism about the EAC: Some people in the private sector in Uganda and in

Tanzania are reportedly not as enthusiastic about deepening EAC integration as the political leadership. They have been calling for a slow down in that process. If these voices succeed in persuading their respective leaderships to slow down then one of the positive attributes of Uganda as an investment destination will be jeopardized and opportunities to expand production including of rice will be less.

Calls for protectionist policies: in the wake of rising food prices and pockets of food shortages in Uganda there were calls for government to impose bans on exportation of food products. The progress Uganda has achieved on the economic front has been based on its government's pursuit of liberal economic and trade policies. If these are curtailed, then progress will be slowed down.

7.5.3 Buyer Preferences

As this study was able to establish, not all rice attracts the same preference from consumers. The most preferred varieties are the "super" brand which is grown in Mbale and goes for Shs 3,000 per kg, followed by the Pakistani brand which goes for Shs 2,500 per kg, and "Kaiso" brand as well as the Tanzanian brand which goes for Shs 2,300. The cheaper brands are usually bought by the poor, while the rich class goes for the high quality brand. The preference for the "Super" and "Kaiso" brands is of rice is attributed to their taste and their quality. They are known to expand upon preparation and are not marshy.

8.0 THE SORGHUM SUB-SECTOR

Sorghum is a tropical cereal grass grown across the world primarily in warmer climatic areas (i.e. semi-arid parts) of the world. It can also survive in cool weather as well as in waterlogged habitats. It grows in a wide variety of soils and is more drought-resistant than other summer grains, but it does better when the soil is enriched with compost or fertilisers prior to planting. Though still largely subsistence, it is increasingly becoming the foundation for food and beverage industries. Because of its adaptability to a wide range of ecological conditions, it ranks fifth in production and consumption for more than 500 million people in more than 30 countries⁵.

8.1 SORGHUM PRODUCTION

In Uganda, a large amount of sorghum is grown predominantly in the northern and eastern Uganda where most of it is consumed as food. In contrast with other countries where intercropping is prevalent, Uganda's sorghum is planted as a sole crop. Production is mainly done manually with little use of tractors. The main growing seasons for Uganda are March to June and August to November. This is exceptional for the south-western areas where sowing is primarily in December and January. Uganda and Kenya share the same harvest season of July to August. Current Sorghum production stands at 490 MT (RATIN, 2009).

Table 7.1: Sorghum Production in Uganda, 2004 – 2008

	2004	2005	2006	2007	2008
Area planted (Ha)	285	294	308	314	321
Production (MT)	399,000	449,000	440,000	458,000	477,000

Source: UBOS, 2009

As Table 7.1 shows, the area planted in the period 2004 – 2008 has been largely small increasing only marginally, from 285 to 321 ha. The increase has been on account of the increasing consumption of sorghum in the brewing of beer (*Eagle* brand) in eastern Uganda, grown mostly on contract terms. Even then, however, the quantity produced has remained insignificant.

8.1.1 Main Sorghum Growing Areas

⁵ Sorghum is grown in 98 countries (in Africa, Asia, Oceania, and the Americas). The main producers of sorghum are Nigeria, India, USA, Mexico, Sudan, China and Argentina. Other sorghum producing countries are Mauritania, Gambia, Mali, Burkina Faso, Ghana, Niger, Somalia and Yemen.

Production is concentrated in the Karamoja region, parts of eastern and northern Uganda plus the south west highlands of Kabale and Kisoro. Sweet sorghum is also grown in Uganda and used for production of sugar, alcohol, syrups, jaggery, fodder, etc. The crop is now demonstrated in Kawanda and Kakiri in Wakiso district. In Kayunga, 200 acres of land have been secured for commodity production by use of imported seeds. It is anticipated that with increased production the commodity will be used to make ethanol which may be mixed with petrol to form a good fuel with reduced polluting emission gases. There is a ready market for this type of sorghum but the challenge remains in increasing production.

8.2 SORGHUM CONSUMPTION

8.2.1 Domestic Consumption

Sorghum is processed into a wide variety of nutritious traditional foods, such as semi-leavened bread, couscous, dumplings and fermented and non-fermented porridges. It is also used for making traditional local brews. New products, such as soft porridge and non-alcoholic malt beverages have also been produced. In a competitive environment of multinational enterprises, sorghum has been found to be a good alternative to barley for beer brewing. Indeed, one of the main breweries in Uganda, (Nile Breweries) is using sorghum for production of the *Eagle Pilsner Lager*. The other major brewery, Uganda Breweries located in Kampala also utilises sorghum in production of a beer lager under the Senator brand.

Sorghum is a main staple food in the northern, north-eastern and south-western parts of Uganda. It is mainly consumed in Katakwi, Kumi, Soroti, Pallisa and Tororo district in the east. In the north-east, Sorghum is mainly consumed in the Karamoja sub-region, parts of northern Uganda in the highlands of south western Uganda. It is pressed into a wide variety of nutritious traditional foods such as semi-leavened bread, dumplings, fermented and non fermented porridge.

Sorghum consumption is localized to growing areas. Per capita consumption of sorghum in Uganda is highest in the eastern and north-eastern regions. Sorghum is processed to offer various by-products, which include traditional brew (*Malwa*), sorghum flour, etc. After drying, the grains are crushed to produce sorghum flour. The traditional milling is still practiced in rural areas, but mechanized milling is more popular for commercial processing throughout the country. Several brands are available after processing but flours with lighter colours and moderate texture are considered good. The quality is defined by the sorghum variety and milling process.

Malt is used for manufacturing sorghum beer (traditional African beer). The commodity is used in the manufacture of two types of beer: clear beer and opaque beer. The latter is a traditional, low-alcohol African beer that contains fine

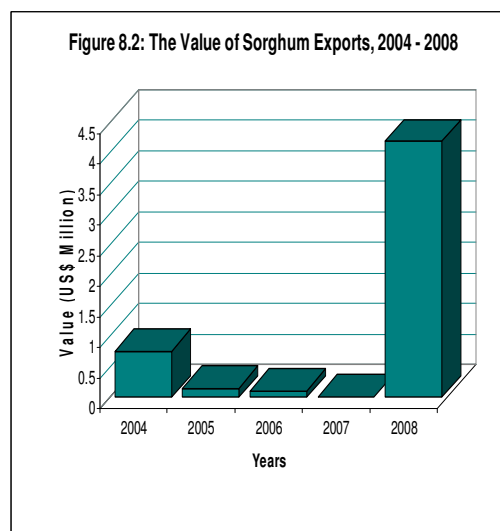
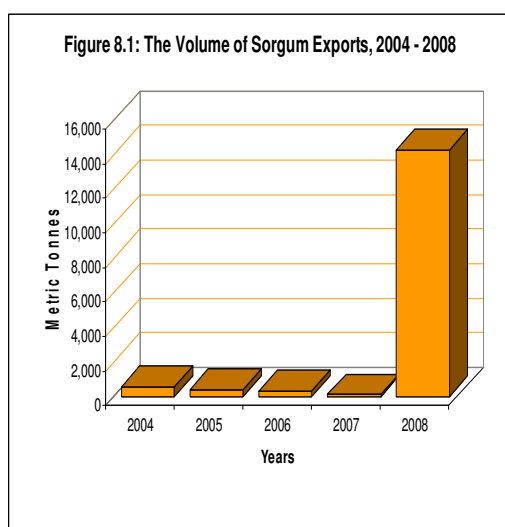
suspended particles. It is an important ingredient in home-brewed beers. In Uganda, such beer is known by different names, i.e. *Tonto* in Buganda, *Malwa*, and *Lachoi* in Lira.

Since 2002, Nile Breweries Ltd has been promoting the cultivation of *Epuripur* type of sorghum. The crop is used to make *Eagle Extra* and *Eagle Lager* beers both for the local and export markets. The commodity is the best alternative to barley for lager beer brewing whose demand has been increasing gradually. Apart from the beer brewing industry, the commodity is gaining market in the production of dietary packed foods for children. In this industry, the commodity is mixed with other nutritious cereals to make good sorghum foods.

8.2.2 Sorghum Trade

A. Sorghum Exports

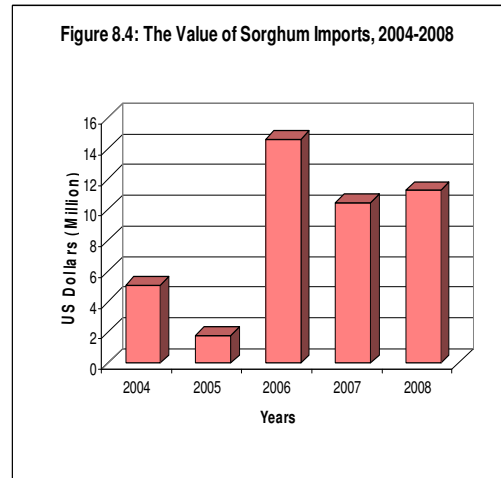
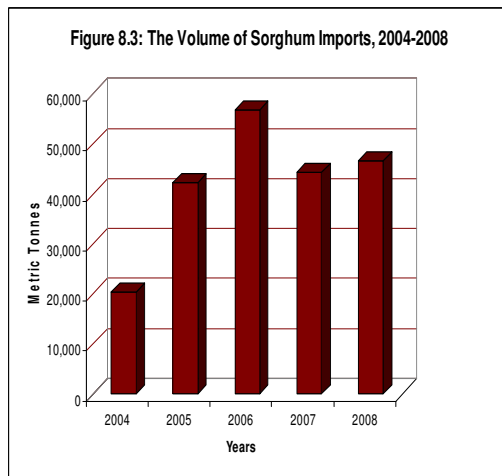
Currently, Southern Sudan is the biggest market for Ugandan sorghum, where small quantities of about 1-5 bags of 100 kg are exported. About 95% of the trade in the commodity is not recorded and for this reason, the exact quantities exported are not well established. Other markets for Ugandan sorghum include Kenya, and the Democratic Republic of Congo (DRC). Currently the country exports 1,049 MT to Kenya through the Busia border point. About 85% of the sorghum is exported unprocessed. Trade export volumes have been fluctuating over years, resulting from the irregularity in sorghum production and supply. Indeed, as Figure 8.1 below shows, the largest volumes officially recorded were in 2008, when the country exported a total of MT 14,284 of sorghum.



Source: Uganda Revenue Authority

B. Sorghum Imports

Some sorghum has been imported to supplement local production. Currently, the main sorghum imports are of the *Epuripur* and sweet sorghum varieties. Sweet sorghum is imported for production of sugar, alcohol, syrups, jaggery, fodder, etc and for replanting. *Epuripur*, on the other hand, is imported for beer production by Nile Breweries Uganda Ltd. Nile Breweries Uganda Ltd, and its sister companies in the region, has played a key role in commercialization of sorghum. It has a current requirement level of up to 5,000 MT for its operations.



Source: Uganda Revenue Authority

Figures 8.3 and 8.4 above show imports of sorghum in the period 2004 – 2008. As can be seen, imports of sorghum increased from 2004 to 2006 (MT 20,515 to 56,845 respectively), but have been on the decline recording MT 46,681 in 2008. Similarly, in spite of the increase in volume during 2004-2006, the value was low, because the prices were low in the market.

8.3 VALUE CHAIN MAPPING

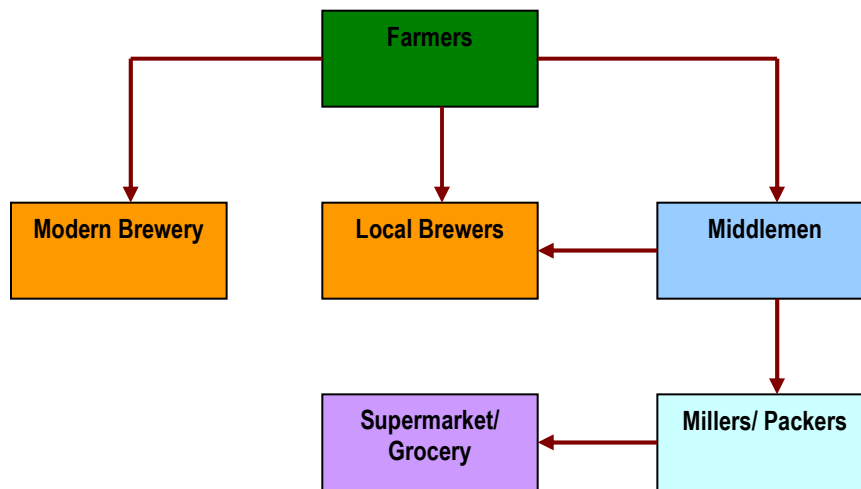
8.3.1 Functions Matrix

Sorghum is a minority crop in Uganda and trading in the commodity is fairly new and at a low level as most of the production has traditionally been for own consumption and for home brewing. However, the entry of the brewing industry has brought a new dimension into the sub-sector. The traditional varieties when traded have been sold by the farmer directly to local brewers or through middlemen. The latter then sell to final users – usually local beer brewers. Processing into flour for home consumption/brewing has in the past been mainly by traditional grinding stone, though motorised milling is spreading even into small trading centres.

For the *epuripur* variety, cultivation is ordinarily on contract to the modern brewery that extends certain credit facilities and purchases directly from the farmers. A similar arrangement exists for the sweet varieties used in sugar/jaggery production.

Small quantities of the sweet variety find their way into production of packed foods in mixtures with other ingredients such as cassava and soybeans.

Figure 8.5: The Sorghum Value Chain



8.4 CONSTRAINTS AND OPPORTUNITIES

Sorghum is a minority crop in Uganda, but its production and trade suffer from similar constraints as the other agricultural staples. These include low levels of technology employed for production and for processing, lack of adequate credit, lack of proper on-farm storage facilities, inadequate attention to standards and a poor marketing infrastructure.

8.5 END MARKET ANALYSIS

8.5.1 Key Trends in the Sorghum Sub-sector

Sorghum production has been rising but only marginally. Since 2004 the area under cultivation of the crop has risen by just 12.6% and most of this increase has more likely been on account of the new demand by the brewing industry. Total tonnage has increased by about 20% over the same period. It is possible that the other breweries will emulate Nile Breweries Ltd and go into partnership with farmers to produce sorghum for brewing a lower market beer brand using that resource. They will at the same time be taking advantage of the lower excise duty

that beer brewed using local ingredients attracts. It is however, unlikely that these cheaper brews will become a major competitor for the established malt (barley) based brands that have a long established steady clientele. So although there are chances for increased sorghum production in response to such an eventuality, the increase is probably going to be modest in the foreseeable future.

8.5.2 SWOT Analysis: Views from the Market Place

A. Strengths:

Fertile soils: Uganda's soils are reputed to be extremely fertile and capable of supporting most crops especially if rains in the main growing areas are steady. Therefore even without use of chemical fertilisers, sorghum production can thrive.

Guaranteed market: For non-food sorghum there is a guaranteed market at a reasonable price by Nile Breweries Ltd. for its contracted farmers. This should provide some prospects for continued production albeit for a market that is limited and dependent on the breweries plans over which the farmers have little say.

Political Stability and favourable business environment: For the past 20 years or so, the country has experienced a remarkable level of political stability and favourable economic policies which have engendered steady growth in the economy and confidence in the country's nascent private sector. This augurs well for the continued expansion in production and also in regional and international trade in sorghum.

B. Weaknesses

An unclear agricultural policy: Although the GOU has been implementing private sector friendly policies, its specific policy on agriculture remains unclear. There are no known incentives for farmers to increase production and no attempts to ensure they receive an economic return for their efforts. This results in wildly fluctuating prices and exploitation by unscrupulous traders and middlemen. These phenomena can be a disincentive to expand production. Moreover, many smallholders do not own their land outright and cannot use it to secure production credits from banks. Although a new land law has been passed recently that would confer some rights to tenants on land, there is still opposition to the law by land owners and its effective implementation is in the balance.

Low level technologies: Uganda continues to produce sorghum using mostly low level technologies. Further, because agricultural chemicals are expensive, they are not used enough by smallholders. This low technology leads to *low yields, high losses* to pests and disease and to poor post-harvest handling.

Poor marketing and transport infrastructure: When commodity marketing was liberalised in the 1990s, an inexperienced and poorly resourced private sector stepped in to try and cope. These new entrants into the sector (excepting the Nile

Breweries Ltd. and its contract farmers) have yet to establish the kind of infrastructure that would encourage efficient marketing. There are no adequate on-farm stores, and there are no rural warehouses. The road network especially off the main central government maintained highways are in a bad state and render produce that more costly.

C. Opportunities

Deepening regional integration: The countries of the EAC are moving toward the establishment of a common market thus creating a market of over 100 million consumers. Uganda is well placed to supply this market with beer made out of sorghum thus providing opportunities for expansion in the production of the crop.

Other breweries emulating Nile Breweries Ltd.: Uganda has two other breweries that could in the short term emulate Nile Breweries Ltd and manufacture a lower market beer using sorghum. In that case, there are prospects for more farmers in the eastern part of the country and elsewhere being contracted to produce sorghum for that purpose.

D. Threats

Discontinuation of production of low market beer by Nile Breweries Ltd.: Uganda has a history of failed brands in the beer industry. Both the big breweries have in the past introduced new brands that did not survive for long on the market. If that should happen to these new ventures, the production of sorghum will suffer.

Production based in drought prone districts: Although rainfall in Uganda is generally abundant and stable, nevertheless some areas have recently been prone to long periods of drought. The main sorghum growing districts in eastern Uganda are among such areas that have experienced periods of drought in recent years.

Scepticism about the EAC: Some people in the private sector in Uganda and in Tanzania are reportedly not as enthusiastic about deepening EAC integration as the political leadership. They have been calling for a slow down in that process. If these voices succeed in persuading their respective leaderships to slow down then one of the positive attributes of Uganda as an investment destination will be jeopardised and opportunities to expand production of sorghum and beer will be less.

9.0 THE MILLET SUB-SECTOR

9.1 MILLET PRODUCTION

Millet is a cereal grass with many small seeds. The crop has different types which include pearl millet, finger millet, proso millet, and foxtail millet. However, the most grown types in Uganda are the pearl and finger millet. Over 50% (probably over 95%) of total millet produced in Uganda is finger millet. It is a traditional crop with a lot of trade and export potential. The crop is grown for consumption of food, beer, animal feeds, etc.

Production of millet is still at subsistence level. Production is predominantly by small-scale farmers with production capacity of about 0-3 acres of land with yields substantially lower than for other cereals. This results from high production costs especially during and after harvest. However, large scale commercial farmers are beginning to emerge, producing mainly for brewing industries. The crop takes about four month to mature and in Uganda it is grown twice a year. The first planting season begins in March and ends in June, while the second season starts in September and ends in December. Major constraints to production however include the millet wilt and farm grain losses resulting from poor commodity handling.

9.1.1 Main Millet Growing Areas

Millet is mainly produced in the northern and eastern parts of Uganda and in some parts of western Uganda. The main millet producing districts include Gulu, Lira, Pader, Kitgum, Karamoja, Soroti, Tororo, Kabale, etc. In these areas, production is primarily dominated by small scale subsistence farmers, accounting for over 85% of total production. Medium and large scale farmers account for about 10% of farm production. However, even with the emerging traces of medium and large scale production, millet production remains highly subsistence.

9.2 MILLET CONSUMPTION

9.2.1 Domestic Consumption

Millet is consumed as a staple food (about 80%), drink, and feed. Feed use is still very small, accounting for less than 2% of total millet use. The commodity contains high levels of methionine, cystine, and other vital amino acids for human health. Pearl millet is also a good source of pro-vitamin A. With all these food values, millet provides 75% of total caloric intakes for the poor.

The biggest percentage of millet produced in Uganda is consumed as food (about 80%). There are several by products prepared from millet and these differ from region to region. In many parts of the country, where millet is consumed as a food, it is processed into a local cake commonly known as *Kalo*. In the western

region it is used to prepare a local brew locally known as Bushera with different types, whereas in central Uganda it is consumed in porridge form after processing. Packed millet is mainly processed by big processing companies such Maganjo Millers, Family Diet, etc.

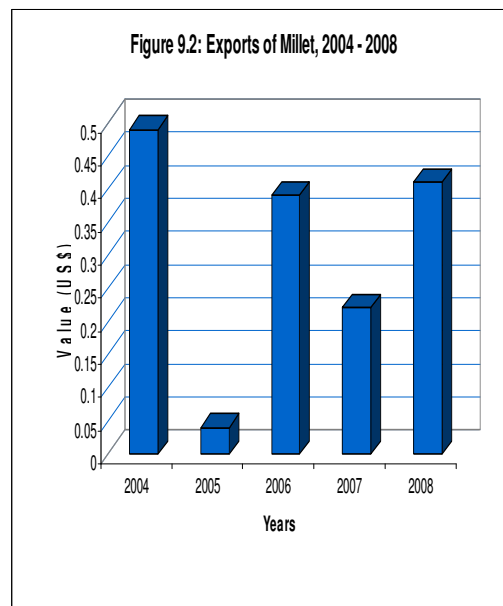
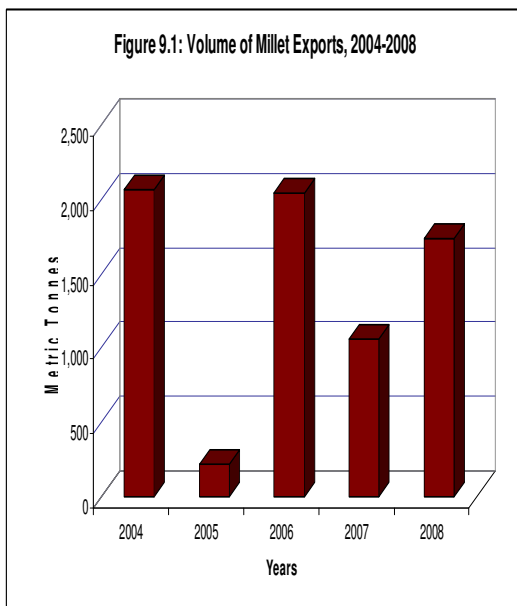
There is a growing domestic trade in millet between districts, with grains moving from areas of surplus to deficit areas. Current surplus districts include Gulu, Kitgum, Lira, Pader, Pallisa, Soroti, Tororo, Kibaale, Kabale, etc. These export to deficit areas and major urban centres such as Kampala.

The commodity has different sourcing points. These include supermarkets and retail shops. Large processors make big purchases from large scale farmers, and/or big village stores. These sell to supermarkets and to neighbouring countries. Farmers consume the biggest part of their output after processing. For purposes of food security, the commodity is stored in local stores for consumption during off peak. It has been noted that village consumers exchange the commodity for other goods in times of crisis.

9.2.2 Millet Trade

A. Millet Exports

Uganda is a net producer of millet and has been exporting to the region. In the period 2004 – 2008, millet exports were volatile, with the peak recorded in 2004, when the country exported 2,067 metric tonnes worth US\$ 494,694. Exports fell in 2005 to MT 215 (worth US\$ 41,440) before rising again in 2006 to MT 2,043 (or US\$ 392,769), and MT 1,741 valued at US\$ 406,573. Figure 9.1 below shows the exports of millet in the period under review.



Source: URA

B. Millet Imports

Uganda is self-sufficient in millet production. Imports of millet have been very minimal. Figures obtained from the URA indicate that the country imported MT 200 in 2006 and another MT 128,140 in 2008.

9.3 VALUE CHAIN MAPPING

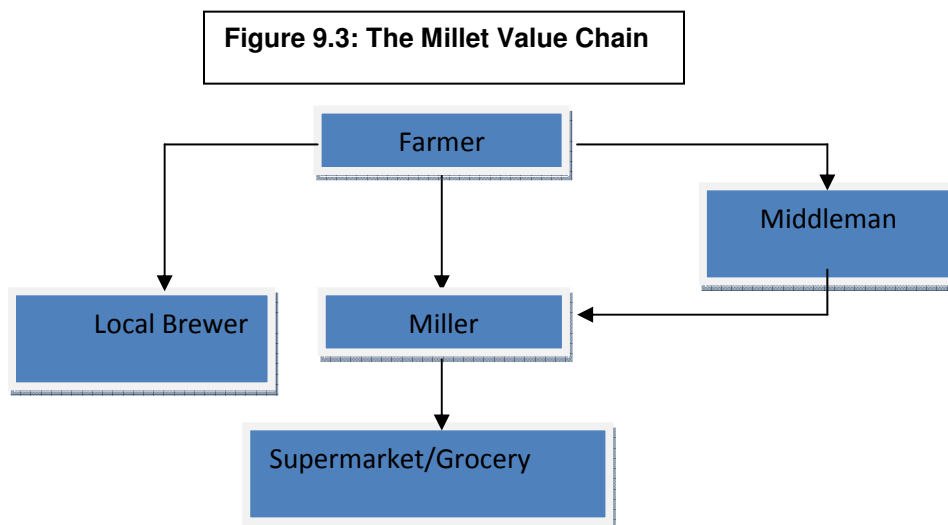
9.3.1 Functions Matrix

Farmers: Smallholder farmers grow the bulk of all millet produced in Uganda. They are also responsible for the preliminary processing that is performed at the farm/household level including open air sun drying, threshing, winnowing and roasting. While most households will often have traditional grinding stones for making flour, there is growing recourse to commercial millers who, for a fee, will mill even small quantities for home consumption. These motorised milling establishments are present even in remote townships and trading centres.

Traders/ Middlemen: Rural traders buy most of the millet traded in the rural areas. Their functions are similar to those of the maize agents. The difference, however, is that they supply to the farmers free of charge, the gunny bags provided by the millers, and advise the millet millers when there is sufficient crop so that the latter can provide transportation. The rural traders make a profit of Shs 10-20 on every kilogram of millet assembled. The profit margin is a function of demand for, and supply of, rice in the market.

Millers: Larger bulk millers are found in the larger towns such as Mbale, Jinja, and Kampala among others. These produce and pack in various sized containers including sacks, and kraft paper consumer packs. Some of the more sophisticated millers also produce a fortified variety with added vitamins and minerals.

The about 20% of production that is not consumed on the farm is traded in a similar manner to sorghum – i.e. from farmer direct to brewers in the immediate surroundings or through middlemen to traders who then sell to big millers in the towns and cities. Consumer packs (1kg to 15kg) reach the final consumer through supermarkets, groceries and small retail shops. Millet is not common on the menus of institutions such as schools, prisons and hospitals.



9.4 CONSTRAINTS AND OPPORTUNITIES

Millet production is extremely labour intensive and this factor tends to militate against its production. Like for most other traditional staples, the implements for its production are very inefficient and so the crop suffers from application of very low technology. While only a small proportion of production is traded, the marketing system is not well developed. Farmers are usually price takers rather than price setters. This also discourages farmers, especially smallholders from making any great efforts to expand production. Millet cultivation is also suffering from the emergence of new crops that are easier to grow and are more lucrative. It is also victim to subtle changes in consumer tastes among traditional eaters – the growing popularity of maize (ugali) being a case in point.

Again as for most other crops produced predominantly by peasants, production credit remains a major constraint as they (peasants) are seen as a very high risk group often not having assets that can be held as collateral.

But the emergence of SACCOs and associated microfinance institutions can on one hand be seen as an opportunity for smallholder producers to access credit, other constraints notwithstanding. Moreover, the growing poultry industry in Uganda is an opportunity for growing demand for millet as high protein cereal usable in the feeds industry.

9.5 END MARKET ANALYSIS

9.5.1 Key Trends in the Millet Sub-sector

Millet production is estimated to have risen by an average 18.8% between 2004 and 2008 comparing favourably with growth in the production of other cereals except rice (41.3% growth). Production however, remains largely at subsistence level and consumption mostly regional. But millet and traditional millet products are still of importance in many cultural rites and functions such as marriage funerals and others.

9.5.2 SWOT Analysis: Views from the Market Place

A. Strengths

Fertile soils: Uganda's soils are reputed to be extremely fertile and capable of supporting most crops especially if rains in the main growing areas are steady. Therefore even without use of chemical fertilisers, millet production can thrive.

Strong place in cultural rituals and functions: In many traditional functions and rituals, millet and millet products such as beer, remain important. This alone should ensure that the crop will continue to be produced.

Political Stability and favourable business environment: For the past 20 years or so, the country has experienced a remarkable level of political stability and favourable economic policies which have engendered steady growth in the economy and confidence in the country's nascent private sector. This augurs well for the continued expansion in production and also in regional trade in millet.

B. Weaknesses

An unclear agricultural policy: Though generally GoU has been implementing private sector friendly policies, its specific policy on agriculture remains unclear. There are no known incentives for farmers to increase production and no attempts to ensure the farmers receive an economic return for their effort. This results in wildly fluctuating prices and exploitation by unscrupulous traders and middlemen. These phenomena can be a disincentive to expand production. Moreover, many smallholders do not own their land outright and cannot use it to secure production credits from banks. Although a new land law has been passed recently that would confer some rights to tenants on land, there is still opposition to the law by land owners and its effective implementation is in the balance.

Low level technologies: Uganda continues to produce sorghum using mostly low level technologies. Further, because agricultural chemicals are expensive, they are not used enough by smallholders. This low technology leads to *low yields, high losses* to pests and disease and to poor post-harvest handling.

Poor marketing and transport infrastructure: When commodity marketing was liberalised in the 1990s, an inexperienced and poorly resourced private sector stepped in to try and cope. These new entrants into the sector have yet to establish the kind of infrastructure that would encourage efficient marketing. There are no

adequate on-farm stores, and there are no rural warehouses. The road net work especially off the main central government maintained highways are in a bad state and render produce that more costly.

C. Opportunities

Deepening regional integration: The countries of the EAC are moving toward the establishment of a common market thus creating a market of over 100 million consumers. Uganda is well placed to supply this market with beer made out of sorghum thus providing opportunities for expansion in the production of the crop.

Expanding demand for animal feeds: The poultry and other livestock activities are growing in Uganda. Millet is a high protein cereal that can be used for the manufacture of high grade animal feeds.

D. Threats

Production based in drought prone districts: Although rainfall in Uganda is generally abundant and stable, nevertheless some areas have recently been prone to long periods of drought. Some of the main millet growing districts in eastern Uganda are among such areas that have experienced periods of drought in recent years.

Skepticism about the EAC: Some people in the private sector in Uganda and in Tanzania are reportedly not as enthusiastic about deepening EAC integration as the political leadership. They have been calling for a slow down in that process. If these voices succeed in persuading their respective leaderships to slow down then one of the positive attributes of Uganda as an investment destination will be jeopardised and opportunities to expand production millet for the regional market will be less.

Growing popularity of maize, rice: the growing popularity of maize and rice and the introduction of newer commercial crops such as mangos, and citrus is taking away land that could have been used for millet production.

9.5.3 Buyer Preferences

Millet flour is marketed in two main varieties – roasted and mixed with cassava or not roasted or mixed. The majority of millet eaters prefer the roasted/cassava variety (variously known as *karo*, *atap* or *kwon*) for their food. The not-roasted-not-mixed variety is mostly for porridge, a popular breakfast cereal in the country including in urban areas. A small quantity is marketed mixed with soy flour presented mostly as an infant food preparation. As already noted, some millers are also marketing a variety fortified with vitamins and other mineral supplements.

A survey of Kampala's supermarkets shows that consumer packs range from 1kg to 15 kg with the 5 kg reportedly the most popular pack. At least one large

supermarket indicated that they will only stock bar coded packages for easy processing and stock control.

10.0 THE CASSAVA SUB-SECTOR

Cassava is a perennial, woody shrub which grows between one to four metres in height. The root can grow up to 15 cm in diameter and reach 120 cm in length to weigh between one and eight kilograms. The roots of a 1-1.5 year-old have starch content of 20 – 32%. Cassava is an excellent source of carbohydrates but an inferior source of protein, fat and vitamins.

10.1 CASSAVA PRODUCTION

Cassava is one of the most important staple foods in Uganda. In fact, Uganda is Africa's sixth largest cassava producer with 2004/05 production records estimated at 5.5 million MT. In Uganda, cassava production is second to banana, although it is increasingly facing competition from other crops, such as wheat and maize. Nonetheless, cassava is better than maize in terms of income generation and is more profitable. Cassava production is largely subsistence with 60% going to consumption and 40% to markets.

Table 10.1: Cassava Production in Uganda, 2004 – 2008

	2004	2005	2006	2007	2008
Area planted (Ha)	407	387	379	386	398
Production (MT)	5,500	5,576	4,924	4,973	5,072

Source: UBOS, 2009

As can be seen from Table 10.1 above, between 2004 and 2006, the area planted declined, the quantity produced remained high, largely due to a bumper harvest on account of good climate. In 2006 – 2008, while the area planted remained low, it slowly picked up just as did the quantity produced.

Cassava is known as “poor man’s crop”. It is predominantly grown by subsistence farmers as a staple crop on plots averaging 1 to 3 acres. Cassava is planted during the long rainy season (March – May) and its maturity time (which depends very much on the variety) ranges from 6 months to 24 months (bitter varieties take longer to mature than the sweet varieties). The average yield is between 6 to 10 tonnes of fresh cassava per hectare, which translates to 2-3 tonnes on dry weight basis (ratio 3:1). Planting material of 20,000 cuttings can be planted on a hectare and from each stem around 10 cuttings can be harvested annually. A nursery can produce for 5 years if fertilizer is applied after the first year, although, the plants will not have any tubers after the third year. Sweet cassava is normally harvested by piece meal while bitter cassava varieties are harvested by uprooting the whole plant.

Cassava does not have a mature stage. This allows the crop to be harvested at a farmer's discretion. A plant can be harvested when its roots are sufficiently developed to meet a consumer's needs or delayed till the next growing season. This feature makes cassava an ideal secondary crop for small-scale farmers in Uganda, as they can stagger their harvesting activities to ensure that resources are not thinly stretched between crops. It also allows farmers to influence the market supply by delaying harvesting if the market is over-supplied and to take advantage of price swings. Although a farmer can generally decide when to harvest a cassava crop, because of the plant's physical attributes, post-harvesting activities must follow a strict short timeframe. Therefore, a farmer's ability to devote time to post-harvesting activities will affect when cassava should be harvested.

10.1.1 Main Cassava Growing Areas

The main cassava producing area is eastern Uganda, followed by northern and western regions. The smallest amount produced comes from the central districts. On account of its resilience to drought conditions, cassava plays a major role in the farming systems of the north and the east of the country.

10.2 CASSAVA CONSUMPTION

10.2.1 Domestic Consumption

Cassava remains one of the staple foods in the country. Unlike products such as maize, wheat and potatoes, cassava has not evolved from a subsistence crop to a commercial crop. It is consumed predominantly in rural areas than in urban areas, a reflection of the greater choice of foods available in most towns. This is not to suggest, however, that cassava (especially the flour) does not play a major part in urban diets. When measured on a caloric basis, it is one of the cheapest sources of carbohydrate and therefore suitable for the urban poor to match their food budgets. As a consequence, wealthier urban consumers often regard it a "poor man's food" and prefer more expensive food staples, such as rice, *Matooke* (a food staple prepared from banana) and Irish potatoes.

More preference is given to the sweet variety of cassava, especially in urban areas, while the bitter-tasting variety is dried and milled into flour. The bulk of the cassava that is not consumed in fresh form (i.e. boiled), is peeled and sliced into pieces, called "chips". These are milled into flour, which can be stored for long periods. The flour is often mixed with millet flour to produce a more nutritious and tasty food staple.

Studies conducted in Uganda show that cassava consumption is lowest in the central region, due in particular, to the traditional preference for *Matooke*. However, urban areas within the region have experienced major migration from the war-affected northern region, where cassava consumption is more common. This alone has tended to increase the consumption of cassava in the central region. In the eastern region, on the other hand, cassava is a major staple food. In

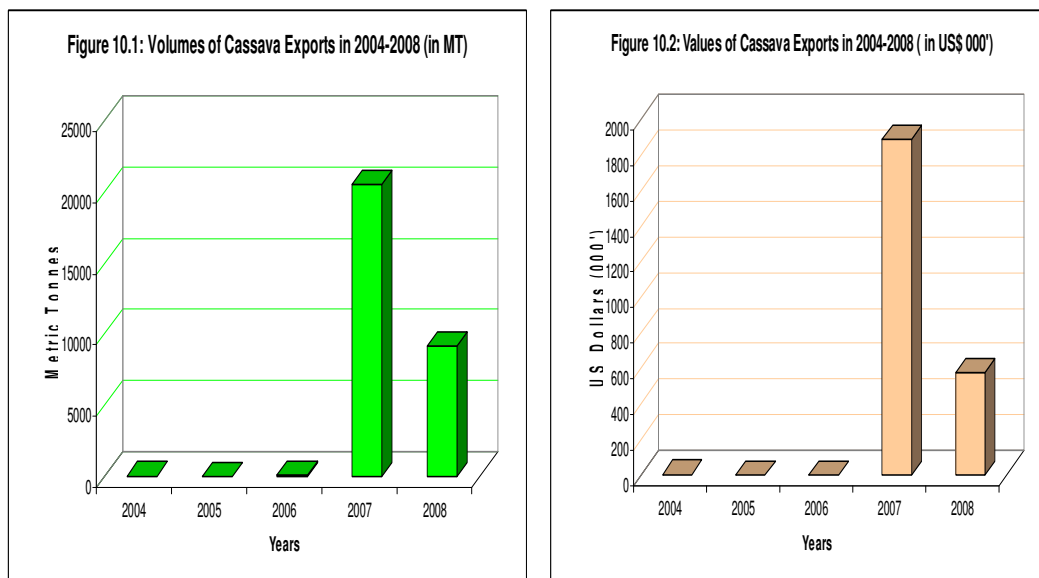
fact, while it is seen as food-security crop in western and central regions, cassava is an important part of the eastern region’s regular diet.

Cassava is also a major raw material in agro-industries. Demand as an industrial raw material is estimated at 46,744 tonnes of fresh cassava per annum, or about 2% of total annual production in Uganda. Industries that use cassava include: manufacture of animal feed; plywood, paperboard and textile industries; production of starch, biscuits and bread production, brewing, production of industrial alcohol, industrial chemicals, etc. It is also used for production of animal feed, with total demand estimated at 20,000 tonnes of fresh cassava roots.

10.2.2 Cassava Trade

A. Cassava Exports

Figure 10.1 below shows exports of cassava for the period 2004 – 2008. As can be seen exports of cassava have been quite low since 2004. The peak exports were in the period 2007 – 2008. Most of these were to the Southern Sudan and parts of Eastern DRC. In 2007, Uganda exported 20,506 metric tonnes of cassava (worth US\$ 1.9 million), falling to 9,143 metric tonnes (worth US\$ 573,591) in 2008 (URA, 2009).



Source: Uganda Revenue Authority

B. Cassava Imports

As noted earlier, Uganda produces enough cassava for internal consumption and for export. Imports of cassava have been quite minimal. In year 2007, imports of cassava into the country stood at 12 metric tonnes worth Shs 839,995 (US\$ 467).

In 2008, there was a slight increase, with imports standing at 1,655 metric tonnes valued at US\$ 73,758 only (UBOS, 2009).

10.3 VALUE CHAIN MAPPING

10.3.1 Functions Matrix

Farmers: Farmers harvest, peel and dry cassava roots. They have several marketing options. Using hired transport they sell directly to rural retailers, rural consumers or, if they are near a town to wholesalers. They also transport cassava (fresh or dried chips) and sell it directly to urban market or through commission agents. Some of the large-scale farmers with big volumes of the crop sell direct to big traders at farm gate. They also sell to traders (who provide links with major consumer markets). Farmers rarely sell on credit terms except with traders with whom they have built a long standing business relationship.

Village assemblers: These are individuals who have access to more capital than their village neighbours. They use these financial resources and their knowledge of the local environment, to bulk cassava chips from the surrounding areas. Customers (usually wholesalers from local towns or travelling traders) are willing to pay for their services to reduce on the time and money spent on assembling sufficient quantities of cassava chips. The assemblers also help in relieving their customers the burden of having to check the quality of the small quantities of chips typically offered by the farmers.

District level wholesalers: These operate in towns in their local areas and to a limited extent also supply chips and flour to wholesalers in major urban centres, (such as Kampala and Jinja). Their primary role is to arrange the transformation of chips into flour (usually using the services of specialised millers), and to stock and sell the flour to their various customers. In a lesser role, district level wholesalers provide another level of bulking between the farmer and the major consumer markets. The survey noted that this type of wholesaler stores dried up cassava in form of chips or flour in moderate quantities (i.e. 50-300 bags) at the end of the dry season, depending on the financial capacity. This may have been influenced by seasonality (end of the dry season) and oversupply in consumption centres, resulting in depressed prices. Few district wholesalers specialize in dry cassava. Typically, they also deal in other food products such as maize, millet and oil seeds. The stronger wholesalers concentrate on cassava chips and flour in the wet season, when sourcing quality chips is a problem yet profits are highest. The less ambitious traders sell more cassava flour during the dry season, when supplies are abundant.

Few district wholesalers secure credit from their sellers. Instead, they provide assembly traders with cash advances when supply is short. This practice is less common when there is ample supply of dried cassava. When asked about their access to the Kampala market, the Jinja-based wholesalers indicated that traders in the capital would prevent them from directly selling to retailers in city markets.

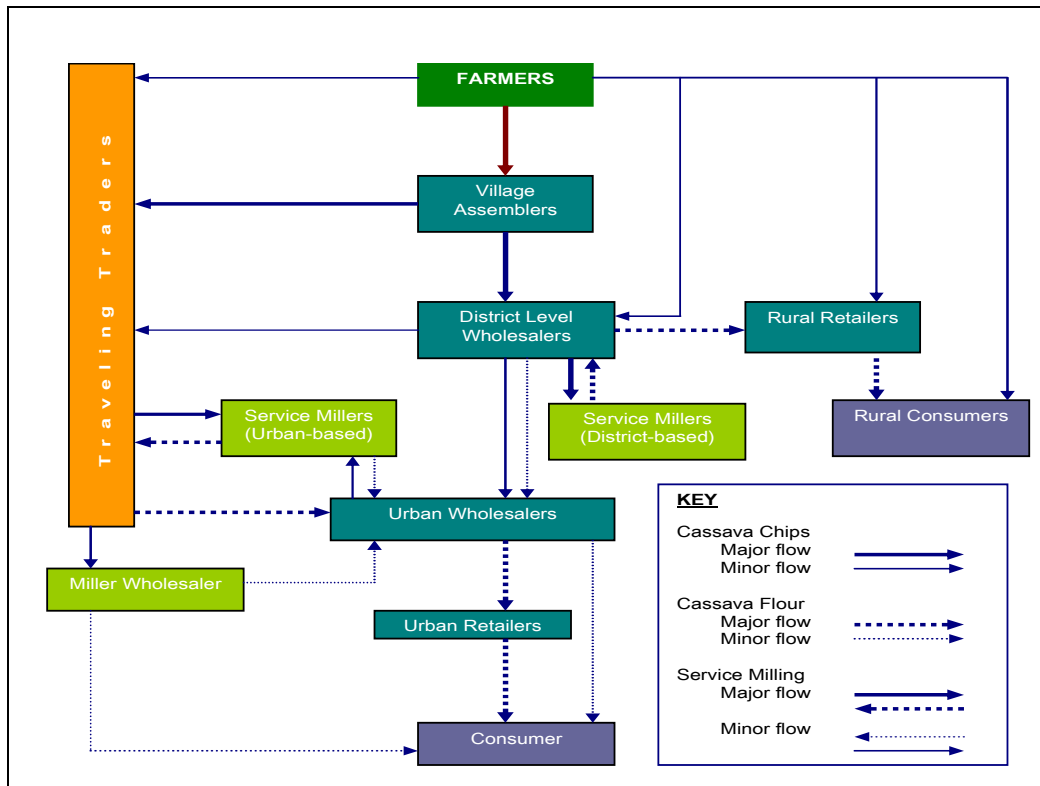
As a consequence, it tends to be travelling traders from Kampala who come to Jinja to buy chips or flour there.

Travelling traders: These traders supply the majority of cassava flour to large urban consumer markets. They turn over their capital rapidly by minimising the length of time between purchase and sale. By avoiding storage, they both limit the risk that prices will move against them and avoid significant overhead costs. Most commonly, such traders buy from several village assemblers in one trip, and hire vehicles to transport the chips to urban centres, where they pay for milling and sell flour to wholesalers. Travelling traders tend to specialise in just one food product.

Urban wholesalers: Urban wholesalers share most of the characteristics of their district level counterparts. The major differences are location and scale. The former distinction is obvious, yet it is the urban wholesalers' location within major markets that allow them to operate on large scale. Whereas district level wholesalers may trade between five and fifteen 100 kg sacks of cassava flour in one week, urban wholesalers commonly sell between 50 and 100 sacks of the same.

Miller/Wholesalers: In towns such as Jinja, Lira, Kampala, etc, there are a number of specialist businesses who combine cassava flour milling with wholesaling. These are efficiently run operations, purchasing either directly from village assemblers (via agents) or from travelling traders. Their average weekly turnover is usually in the region of 10-15 tonnes and milling losses do not exceed 2%.

Figure 10.1: The Value Chain of Dried Cassava



Service Millers: Such businesses do not engage in trade, but merely provide milling services. In rural areas and the smaller district towns, millers use small petrol or diesel-powered mills and do not specialise in milling any one commodity. In larger towns, millers are often specialised and use electricity-powered mills.

Urban Retailers: Most food retailing in urban areas is dominated by a large number of small, non-specialised stores, selling small quantities of numerous products – often food along side manufactured goods (e.g. stationery, hardware, etc). In some urban centres, some retail traders have managed to expand their businesses. In Owino market in Kampala, for example, there are food retailers who have stocked 10 or more bags of flour, (i.e. of maize, cassava or peas), each of which is valued at Shs 25,000 – 60,000.

10.4 CONSTRAINTS AND OPPORTUNITIES

- Cassava production remains traditional, with virtually no use of purchased inputs. This is because of its reputation as a food security crop – it is considered resilient and therefore planted in poor soils with little or no fertilisers.
- With regard to the fresh cassava value chain, there are inefficiencies in the

- marketing chain (such as transport bottlenecks and repeated transactions) which are all very costly, given that fresh cassava is highly perishable. Secondly, the bulkiness and value of fresh cassava can cause transportation costs to be high, thus constituting a large share of the final price. Moreover, the perishability and bulkiness of fresh cassava means that it requires that buyers are located close to the production centres or in villages.
- Dry cassava requires the development of processing service providers. Secondly, reliance on sun-drying for processing of chips and flour creates serious scale issues. In addition, labour intensity of processing is high creating demand for increased availability of small and medium scale processing equipment.
 - Cassava mosaic remains a major constraint to cassava producers. It affects both the leaves and the roots. The cassava leaves turn yellow and shade off, while the cassava it self develops some spots, hardens, and in some cases taste sweet. The new disease tolerant material is insufficiently reaching the farmers and hence they are prone to the disease, leading to low yields and deficits, which is a threat to food security.
 - Most farmers have small plots – 0.5 to 2 hectares per household – and have limited chances of increasing the acreage under (cassava) crop. As a result, cassava is intercropped with other commodities such as beans, maize etc. This affects not only the quantity produced, but also puts the crop at a higher risk of diseases. Where family labour is constrained and hiring of labour becomes necessary, opening of (new) land is limited by the cost of labour especially for the poor households.
 - Poor (feeder) roads result in inaccessibility and high transportation costs and the inability of farmers to sell their surpluses. Inadequate organization by farmers complicates marketing and increases transaction costs. Such costs are normally transferred to the farmers and hence decrease the farm gate price. The absence of large scale processing of cassava into any by product makes the farmers depend on the ad-hoc marketing arrangements and fluctuating demand and prices.

10.5 END MARKET ANALYSIS

10.5.1 Key Trends in the Cassava Sub-sector

Production has lately stagnated at around 5 million tonnes per year as acreage has declined slightly. As there are negligible imports and exports to Sudan in 2007 and 2007 have been of some significance, domestic consumption has fallen if only slightly. Cassava in many Ugandans' diets is complementary to millet consumption, although each is consumable on its own.

10.5.2 SWOT Analysis: Views from the Market Place

A. Strengths

Fertile soils: Uganda's soils are reputed to be extremely fertile and capable of supporting most crops especially if rains in the main growing areas are steady. Moreover cassava is a very drought resistant crop which can withstand extreme conditions.

Political Stability and favourable business environment: For the past 20 years or so, the country has experienced a remarkable level of political stability and favourable economic policies which have engendered steady growth in the economy and confidence in the country's nascent private sector. This augurs well for the continued expansion in production and also in regional and international trade in cassava.

Weaknesses

An unclear agricultural policy: Though generally GOU has been implementing private sector friendly policies, its specific policy on agriculture remains unclear. There are no known incentives for farmers to increase production and no attempts to ensure the farmers receive an economic return for their effort. This results in wildly fluctuating prices and exploitation by unscrupulous traders and middlemen. These phenomena can be a disincentive to expand production. Moreover, many smallholders do not own their land outright and cannot use it to secure production credits from banks. Although a new land law has been passed recently that would confer some rights to tenants on land, there is still opposition to the law by land owners and its effective implementation is in the balance.

Low level technologies: Uganda continues to produce cassava using mostly low level technologies. This low technology leads to *low yields, high losses* to pests and disease and to poor post-harvest handling. Moreover, fresh cassava is highly perishable and so poor handling and processing results in very high losses.

Poor marketing and transport infrastructure: When commodity marketing was liberalised in the 1990s, an inexperienced and poorly resourced private sector stepped in to try and cope. These new entrants into the sector have yet to establish the kind of infrastructure that would encourage efficient marketing. There are no adequate on-farm stores, and there are no rural warehouses. The road net work especially off the main central government maintained highways are in a bad state and render produce that more costly.

B. Opportunities

Deepening regional integration: The countries of the EAC are moving toward the establishment of a common market thus creating a market of over 100 million consumers. Uganda is well placed to supply this market with beer made out of sorghum thus providing opportunities for expansion in the production of the crop.

C. Threats

Cassava mosaic: Cassava mosaic has been a major factor in the production of cassava in Uganda. Efforts are however on-going to control the disease and to produce varieties that are resistant to the virus.

11.0 THE BEANS SUB-SECTOR

Beans and related pulses (pigeon peas, chickpeas, etc) represent an important group of edible leguminous crops with unique potential to address the health, income creation and agricultural sustainability needs of developing countries, including Uganda. As a traditional staple food, beans are a major source of affordable protein, complex carbohydrates, essential micronutrients, dietary fibre, vitamin B and antioxidants in the nutritionally challenged diets of both the rural and urban poor.

11.1 BEANS PRODUCTION

The common bean (*Phaseolus vulgaris*) is a basic constituent to the traditional diet of most Ugandans. Consequently, the crop is to be found in varied cropping systems in the country. The beans grown in Uganda originated in Latin America and were introduced into East Africa by Portuguese traders in the sixteenth century. The area under beans production has been an average 851,000 ha between 2004 and 2008, with quantity produced averaging 445,400 tonnes over the same period. The details are in the Table 11.1 below.

Table 11.1: Uganda: Beans Production, 2004 - 2008

	2004	2005	2006	2007	2008
Area Planted (000 Ha)	812	828	849	870	896
Quantity (000 MT)	455	478	424	430	440

Source: UBOS (2009), Statistical Abstract

A large part of the bean production in Uganda takes place on small farms ranging from 1 to 10 ha in size. Moreover these smallholdings are dispersed, making it difficult to define the main production areas. Resource-poor farmers with very few inputs grow beans primarily on small-scale, marginal farms. Women farmers, who have little or no access to fertilisers and other inputs, grow beans, often intercropping them with cereals (maize, millet, sorghum, etc). In the circumstances, it is not surprising that average yields are low. Much of the bean crop is lost to diseases as well as insect pests or drought, low soil fertility and other factors. Higher yielding climbing varieties have been adopted in some parts of the country.

A number of varieties of beans are grown in Uganda with notable diversity in seed types and adaptation. Local market preferences and variances in climatic and agronomic conditions generally dictate which varieties are popular. There is some bias toward the large-seeded types in Uganda where farmers grow and maintain seed mixtures of all sizes and colours. The grain is an important cash crop and the leaves are also an important vegetable in some parts of the country.

11.1.1 Main Beans Growing Areas

Beans are produced in all the districts of Uganda with outputs ranging from a lowly 1,000 tonnes a year to as much as 30,000 tonnes in some districts. High yields occur in areas with well distributed rainfall and fertile soils. According to a survey by UBOS, 81% of all Ugandan households cultivate beans, with the western region leading in terms of numbers of households growing beans, followed by central, eastern and northern regions in that order. The main districts growing beans include: Kabale, Kapchorwa, Mbale, Apac, Lira, Hoima, and Busoga region; Masindi, Mubende and Gulu.

11.2 BEANS CONSUMPTION

11.2.1 Domestic Consumption

Beans are the most important grain legumes for human consumption in the world. They are estimated to be the second most important source of dietary protein and third most important source of calories. In Uganda, beans are a major staple and a key source of food security for both rural and urban population. Consumer preferences for beans differ, depending on seed types, colour, shape, and brilliance or seed coat lustre. However, many consumers prefer beans with the sweet taste and fast cooking attributes. There is higher demand for bean varieties with these attributes than those which have very attractive seed appearance. Beans are often combined with such energy sources as maize, plantains (*matooke*), or root crops (sweet potatoes, cassava, yams, etc). The high nutritional value of beans in terms of the percentage of protein is an important complement to these starchy foods. In addition, the high mineral content of beans, especially iron and zinc, is advantageous in cases of high prevalence of micronutrient deficiencies such as iron deficiency anaemia.

Most beans produced are consumed locally. Out of the quantities produced between 2004 and 2008 generally over 90% is estimated to have been consumed locally with insignificant amounts being sold informally to neighbouring countries. National annual consumption of beans is estimated at about 58 kg per capita. Consumption has been increasing over years from 29.3 in 1987 to over 50 kg in 2008. Per capita bean consumption in households varies according to levels of production i.e. because of seasonality and food security (NARO, 2008). With the introduction of new bean varieties, average annual household bean income has also more than doubled. The new varieties account for 67% of annual household income from beans production and 45% of household bean consumption. Poor households earn about US\$ 40,000 (about \$23) from beans annually, indicating that beans contribute more to poverty reduction.

Table 11.2: Uganda – Beans Consumption 2004 – 2008 (Tonnes)

	2004	2005	2006	2007	2008
Production	455,000	478,000	424,000	430,000	440,000

Add Imports	0	0	0	0	0
Less Exports ⁶	26,233	28,332	27,087	22,532	37,211
Domestic Consumption	428,767	449,668	393,913	407,468	402,789

Source: Computation based on UBOS, *Statistical Abstract, 2009*

As Table 11.2 above indicates, domestic consumption has been more or less stable in the period 2004 – 2008, declining only slightly in 2006, but picking up slowly. The main reason for this was the long dry spell which hit the bean growing areas, and the increased regional demand, especially from Southern Sudan. More generally, however, is the common belief that demand for beans is income-inelastic and consumption drops as economic levels rise.

Apart from the World Food Programme, the main buyers of beans are institutions (schools, hospitals, police, prisons, restaurants, etc), buying either from village stores or large urban traders. Volumes purchased differ according to the size of the institution. Small institutions buy between 2 and 5 100-kg bags of beans every week, while large institutions procure big volumes of between 5-10 100-kg bags of beans per week. Purchases are mainly done on credit basing on the ruling price in the market.

11.2.2 Beans Trade

A. Beans Exports

There is a significant market for Ugandan beans within the region, but as noted earlier, most of the beans produced are consumed domestically. In spite of this, however, some amounts are exported to the region. Exports are primarily in unprocessed form with little value added. Over 90% of Uganda’s bean market is across the borders. Such trade is categorized into formal and informal operations. The informal trade is particularly significant at the border points of Uganda and Kenya, Sudan, DRC, Tanzania, and Rwanda. It is estimated that about 90 –120 Kg bags of beans are ferried to Kenya through Busia border point. The major participants in this trade are the youth who either carry their commodities on bicycles or cross the border points on foot. Beans are carried in small quantities of up to 5 kilogrammes.

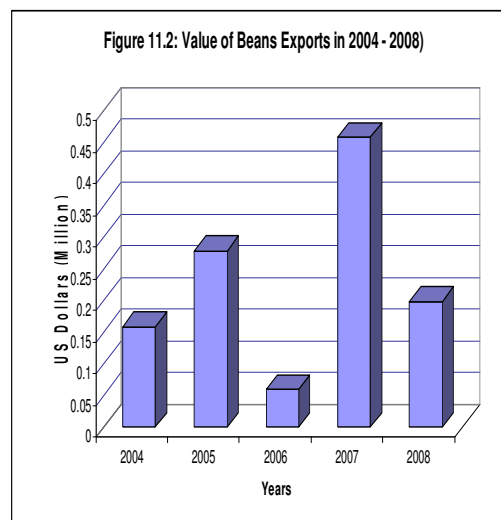
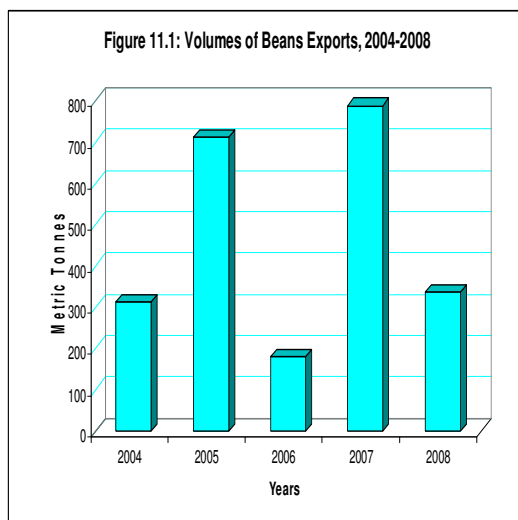
Two groups of market participants are involved in this trade: The first group comprises foreign buyers who travel from neighbouring countries into Uganda to purchase the beans. This group of participant handles a sizeable volume of beans trade. However, the biggest size of this trade is informal. The second group of participants is made up of Ugandan exporters, who include large scale producers, traders/ and companies who mainly export their beans formally through the

⁶ Official data indicate exports of “Beans and other Legumes”. Considering the low quantities and low trading activity in other legumes, the assumption is that these are mostly beans.

border points. They buy the beans from Kampala, Mbale, Kapchorwa, Kasese, Kabale, Kisoro, Mubende, Rakai, Arua, Lira, etc.

It is, however, noted that formal bean trade to these countries is still very small. Figures 11.1 and 11.2 below show the annual average exports in beans for the period 2004 – 2008. As can be seen the highest volumes exported were in 2005 and 2006, when 712.6 and 788.9 metric tonnes were exported. In 2005 and 2006, exports peaked but dropped in 2006 and 2008 due to a decrease in production as a result of the long dry spell. Beans are generally low value commodities. This means that although in volume terms the country exported a lot, they fetched a small value in export revenues – US\$ 0.28 million and US\$ 0.46 million, respectively.

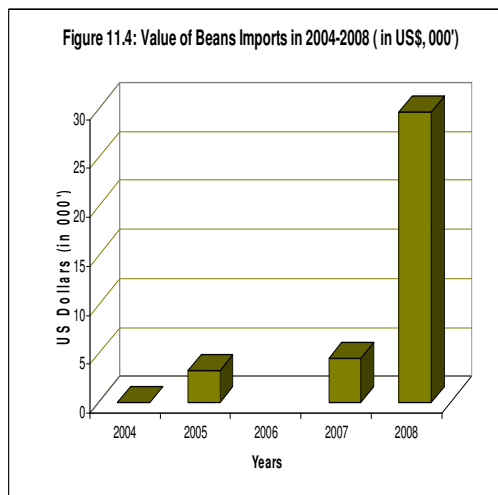
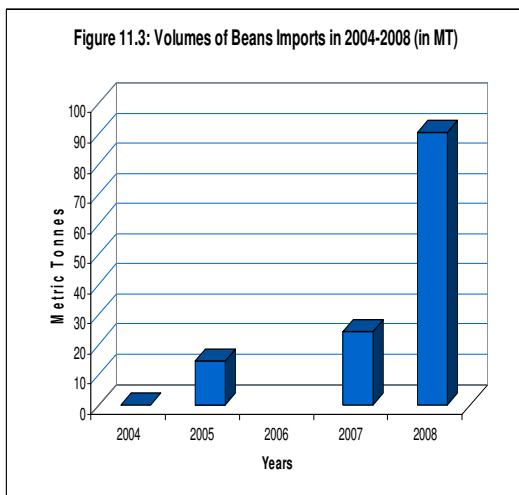
The World Food Programme (WFP) is the largest exporter of beans from Uganda. These are exported to the neighbouring countries of Rwanda, Burundi, the Democratic Republic of Congo, Kenya and Sudan. In 2007, it purchases about 100,000 tons of beans produced in country. WFP uses two procurement mechanisms. Under the Agriculture and Marketing Support Programme, the WFP purchases beans mainly from farmer groups who can supply at least 40 MT and by other community based organizations. WFP’s Vulnerability and Assessment Unit ensures that farmer groups are paid a fair price. Producer groups are also assisted with market information on commodity prices throughout the country. This programme is working well in eastern, central and western Uganda, where farmers have good surpluses every year. The WFP also purchases from traders who can stock bulk and/or supply at least 200 MT of beans. Kampala has the biggest bean traders with sufficient volumes for export.



Source: Uganda Revenue Authority

B. Beans Imports

Competition in the bean market within Uganda is from the Rwanda and DRC mixed beans. They enter Uganda through the border points of Katuna and Mahagi, respectively during times of scarcity. Tanzanian beans from Karagwe region usually cross from the Mutukula border to Kenya via Busia border. Both Tanzanian and Ugandan traders are involved in that trade. Sometimes beans from Tanzania are sold in Kampala markets when bean producing districts are food insecure.



Source: Uganda Revenue Authority

Figures 11.2 and 11.3 above show the volumes (in metric tonnes) and values (in US\$ 000') of imports of beans in the period 2004 – 2008. As can be seen overall, the country has been dependent on its own internal production. Only in 2008, did it import a significant amount of beans equivalent to 90.6 MT, valued at US\$ 29,743.

11.3 VALUE CHAIN MAPPING

11.3.1 Functions Matrix

Farmers

The farmer normally uses seed from his previous crop and shells the pods by hand before sowing. The sowing is done in wet spells to ensure even germination, in general groundnuts are planted between mid February and Mid April during the first season and early August for the second season. Sowing is done in September in Western Uganda. Early planting is advised and necessary in Uganda to reduce risk of *Rosette* infection. Groundnuts require good rain at sowing and during the growing period and dry weather at harvest. These requirements are often better met in early planted crops which may also make better use of soil fertility.

Farmers harvest the groundnuts when the plants have shed their leaves and after inspection of a few pods. The best time to harvest is when the crop has the highest percentage of sound mature kernels. The plants are uprooted by hand, if possible when the soil is moist. After lying in the sun for a few hours the pods are picked

off and removed indoors; they are put out to dry in the sun everyday on bare ground until ready for storage or sale. Spreading variety require the use of a hand hoe for lifting considerably increasing labour requirements, this is one of the reasons farmers prefer bunch types. The groundnut plants are harvested by being pulled or dug up. This is usually called 'lifting'. There are various designs of equipment available to assist in lifting groundnuts.

After drying, the farmers remove the shell. This process is called stripping. This is normally done by hand and is a tedious and time consuming operation. The pods are removed by picking or flailing. Prompt lifting and drying of mature pods is necessary in wet weather to prevent invasion by soil borne fungi. The infections weaken or rot the shell permitting the entry of fungi to the kernel with the loss of quality and development of aflotoxins which pollute the sample. The groundnuts may then be stored or sold.

Middlemen/Traders

The middlemen (traders) include rural (informal) collectors, rural retailers, urban retailers and wholesalers. Rural collectors buy from the farmers and sell the to medium and small scale processors and wholesalers, whereas wholesalers sell at the local and regional markets, and to medium and small scale processors, urban retailers and rural retailers, and the latter (rural retailers) sell the groundnut to end consumers including rural consumers and farmers who buy groundnut as seed (although majority of farmers try to save their own seed from the previous harvest, some may need to purchase from the market for various reasons). Finally urban retailers directly sell to the urban consumers.

Processors

The processors, both small and medium scale, process groundnut into cake and sell the cake directly to livestock feed industry or to cake retailers, who in turn sell to urban and rural consumers, and the regional market. Some processors (especially medium scale ones) may also sell the cake directly to the urban and rural consumers. Small and medium scale processors also process groundnut and may sell the groundnut either directly to the consumers (urban and rural consumers, and the regional market) or indirectly via the cake retailers.

11.4 CONSTRAINTS AND OPPORTUNITIES

The bean value chain is faced with a wide range of challenges as shown below.

A. Production Constraints

At the level of production the main constraints include:

- Limited improved seed variety
- Poor quality seeds

- Loss to pests and diseases
- Limited use of appropriate agronomic practices
- Low soil fertility
- Drought and weather-related factors
- Limited land management practices
- Limited affordability of non-seed inputs:

B. Trade and Marketing Constraints

The main constraints related to trade and marketing include:

- **Inadequate market information:** Farmers lack adequate market information. Price information is communicated to farmers mainly through district radios. However, most of the farmers especially those deep in the villages cannot afford to buy these communication systems. And for those that have access to the radios, the information is not well detailed. Because of inadequate market information, farmers decide on their own procedures, and marketing is done individually leading to low bargaining powers and thus low farm gate prices.
- **Fluctuation of prices:** The prices of the beans are not stable and fluctuate due to a number of factors, including the volume of harvest, source of supply, type of beans, season. In recent years, because of the growing demand from neighbouring countries, the prices have tended to increase.
- **High distribution costs:** Beans are grown in rural areas by peasant households. Quite often the quantities produced are small. Traders have to collect from a large number of farmers in order to make commercially viable quantities. This makes it costly.
- **Mismatch between supply and demand:** There is a mismatch between supply and demand because the harvesting season is not the same throughout the country. As a result, when there is excess supply in one part of the country, there is a deficit in the other. This is also compounded by the poor marketing system in the country, where on account of poor feeder roads, farmers cannot access markets.

11.5 END MARKET ANALYSIS

11.5.1 Key Trends in the Beans Sub-sector

In recent years, domestic production peaked at an estimated 478,000 MT in 2005 and fell to 424,000 MT in 2006 before picking up again to 440,000 MT in 2008. In the meantime official exports continued at under 30,000 MT between 2004 and 2007 rising to 37,000 MT in 2008. With negligible imports, domestic consumption equally fluctuated during the period.

11.5.2 SWOT Analysis: Views from the Market Place

A. Strengths

Applied beans research: Beans are an important source of affordable protein for Ugandans and as such GoU has devoted considerable resources to beans research and the development of suitable improved seeds. There are at the same time a number of companies marketing both indigenously developed and imported seeds.

B. Weaknesses

Low level technologies: A recurring theme in Uganda's smallholder agriculture is the low level of technology applied for production, processing, handling and even marketing. The hand hoe remains the main implement for tilling, planting and weeding. Harvesting is manual, (though on a small holding this is not a very serious constraint), drying is reliant on nature often on bare ground, threshing too is manual and proper storage facilities non-existent. In those circumstances, losses are high and contamination rampant.

C. Opportunities

WFP purchases: For the next few years at least Ugandan beans can consider the WFP as a guaranteed buyer of any surplus beans around as relief efforts in the region continue. The WFP's current policy to procure supplies from within the region makes this possible.

D. Threats

Fluctuating prices: When farmers are unsure about the returns they are likely to get from their effort, the temptation to shift to other crops is high.

Changes in WFP's procurement policy: Though this is not foreseen in the near future, the possibility of a change in WFP's procurement policy cannot be ignored, nor the possibility that relief efforts will be scaled down.

12.0 THE GROUNDNUTS SUB-SECTOR

12.1 GROUNDNUTS PRODUCTION

Groundnut is the second most widely grown legume in Uganda after beans. It has been grown since 1862. Groundnut is a very popular crop, especially in the eastern and northern regions of the country, where it has become part of the people's culture. Groundnuts are grown mainly by small-scale farmers, who plant on average 1.5 - 2 acres each. Although grown for subsistence needs, farmers are able to produce a surplus in good seasons.

Some of the common varieties are Red Beauty, Serenut, and other Valencia type varieties. The Red Beauty variety has a bright attractive colour and is commonly demanded by consumers and therefore buyers. Its main drawback, however, is that it is disease prone (susceptible, in particular to Rosette virus) and farmers can lose a very high percentage of potential harvest volumes. Serenut was developed in Uganda and has four sub-varieties (1, 2, 3, and 4). Each of these has its unique breeding traits, although all of them are known for being disease resistant. Serenut, however, is not very popular with consumers on account of its taste and colour and therefore fetches low prices in the market.

Most of the crop is grown as inter-crop with maize and cassava. It is grown mainly as a rain-fed crop. Although both bunchy and spreading types are grown, now there is a tendency to grow bunchy types because of early maturing habit and ease of cultivation.

Table 12.1: Groundnut Shell Production in Uganda, 2000 – 2008

	2000	2003	2004	2005	2006	2007	2008
Area Harvested (Ha)	199,000	211,000	221,000	225,000	230,000	235,000	244,000
Yield (Kg/Ha)	699	701	-	-	-	-	-
Production (Tonnes)	139,000	148,000	137,000	159,000	154,000	162,000	173,000

Source: UBOS, 2009

12.1.1 Main Groundnuts Growing Areas

Groundnut is grown predominantly in the Eastern and Southern parts of the country. In the Eastern Uganda it is produced mainly on light, loose, and sandy loams, while in Southern Uganda it is also grown in clay loams. Most of the crop is grown as inter-crop with maize and cassava. In the southern region, (which has

two rainy seasons) the crop is grown during the two rainy seasons, with most of the production realized in the first rainy season. The first rain crop is harvested during the dry spell of July, while the second crop is harvested in the November-December dry season. The first rainy season, which lasts from March to June, has more reliable rain than the second rainy season lasting from August to September. Although both bunchy and spreading types are grown, farmers tend to prefer the bunchy types because of their ability to mature early and ease of cultivation.

12.2 GROUNDNUTS CONSUMPTION

12.2.1 Domestic Consumption

Groundnut is mostly consumed locally. The seeds are consumed as roasted peanuts. The flour is used in preparing different dishes. Groundnut cake, after extracting oil, is used as animal feed.

Groundnuts are a high value crop that can be marketed with little processing but are extremely versatile and can be used in a wide range of products. The oil can be used for cooking, they can be used as a shortening or as a base for confectioneries and they can be used to make peanut butter.

12.2.2 Groundnuts Trade

A. Groundnuts Exports

There is very limited international trade in groundnuts with the highest level of export recently being 101 MT worth \$148,000 in 2007.

Table 12.1: Exports of Groundnuts, 2004-2008

	2004	2005	2006	2007	2008
Export Volumes (MT)	1	22	63	101	30
Export Values ('000 US \$)	1	23	8	148	28

Source: UBOS, 2009

12.3 VALUE CHAIN MAPPING

12.3.1 Functions Matrix

Farmers

Groundnuts are grown mainly by small-scale farmers, who plant 2-3 acres per household. The farmer normally uses seed from his previous crop and shells the pods by hand before sowing. The shelled seed may retain its germinating capacity for 6 months after shelling. Sowing is done in wet spells to ensure even germination. In general groundnuts are planted between mid February and Mid April during the first season and early August for the second season. In Western

Uganda, sowing is done in September. Seed dressings help to prevent wastage when germination is delayed. Groundnuts require good rain at sowing and during the growing period and dry weather at harvest. These requirements are often better met in early planted crops which may also make better use of soil fertility.

Groundnuts are considered ready when plants shed their leaves and after inspection of a few pods. The best time to harvest is when the crop has the highest percentage of sound mature kernels. The plants are uprooted by hand, if possible when the soil is moist. After lying in the sun for a few hours the pods are picked off and removed indoors. They are put out to dry in the sun everyday on bare ground until ready for storage or sale.

Groundnut farmers fall into two groups according to gender. Although they are the same in terms of their role and linkages in the value chain, they do, however, differ with regard to their access to inputs. For example, even though all groundnut producers have limited access to formal credit, women are significantly less likely to have access to credit compared to men. Small-scale groundnuts farmers may often act as processors and retailers at the local level. In the value chain small-scale producers (men and women) bring their produce to the rural or urban markets (collection points) where groundnut may be bought directly by (i) rural traders, (ii) town traders, and (iii) city traders.

At the farm level, the profitability of groundnut production depends very much on the volume of output, the price output, and total cost of production. Under conditions of low-cost production (e.g. using seeds from previous harvests and not chemical inputs), farmers are able to earn positive gross margins, even if the yield per acre falls, and the price is low. However, when the costs of production increase, then farmers' profit margins tend to plummet. Table 12.2 below shows the economics of groundnut crop production on a plot of one acre.

Table 12.2: The Economics of groundnut crop production (1 acre)

Farm Operation	Nature of Production		
	Low cost	Average cost	High cost
Land clearing	30,000	30,000	30,000
Ploughing (twice)	100,000	110,000	120,000
Seed	80,000	90,000	100,000
Weeding (twice)	100,000	110,000	120,000
Harvesting	80,000	90,000	100,000
Total prod. Costs (UShs)	390,000	430,000	470,000
Output* (bags)	10 - 20	10 - 20	10 - 20
Price (UShs/bag)	40,000 – 50,000	40,000 – 50,000	40,000 – 50,000
Total revenue (Shs)	400,000 – 1,000,000	400,000 – 1,000,000	400,000 – 1,000,000

Gross margin (UShs)	10,000 – 610,000	(30,000) – 570,000	(70,000) – 530,000
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Note: Groundnut yields range between 10 – 20 bags of unshelled groundnuts; and price of a bag ranges from UShs 40,000 to UShs 50,000. *Based on figures for an average year rather than the first season of 2008.

Source: Adopted from USAID, 2008

Rural Traders

These buy directly from the farmers and sell to the traders in district or county towns. Usually, after buying from the farmers, the rural traders shell the groundnuts before selling to the town traders. They spend about Shs 500/bag for shelling using a manual appropriate technology style hand-operated device. It is noteworthy that one bag of unshelled groundnuts produces about 35 kg of shelled groundnuts. In some cases, rural traders buy shelled groundnuts directly from farmers at a price of about Shs 1,600 – 1,700 per kg. Then they sell the shelled groundnuts to town traders at about Shs 1,800 – 1,900 per kg, earning a margin of Shs 200 per kg.

Town Traders

Town traders operate in the main towns in the districts and deal in produce, including groundnuts. They are involved in both wholesale and retail business. They buy their stock mainly from rural traders, although occasionally they may buy directly from farmers in which case they provide transport services. Town traders also sell groundnuts to buyers from other towns outside the districts, but they tend to deliver directly to buyers in Kampala and the markets in Southern Sudan.

The profit margins of the town traders also vary, depending on the type of groundnut handled. According to USAID (2008), they buy the white type at UShs 1,800/ kg and the red type at UShs 1,900 and sell at a wholesale price of Shs 2,000 and Shs 2,100 /kg, respectively. Hence they make a margin of Shs 200 per kg.

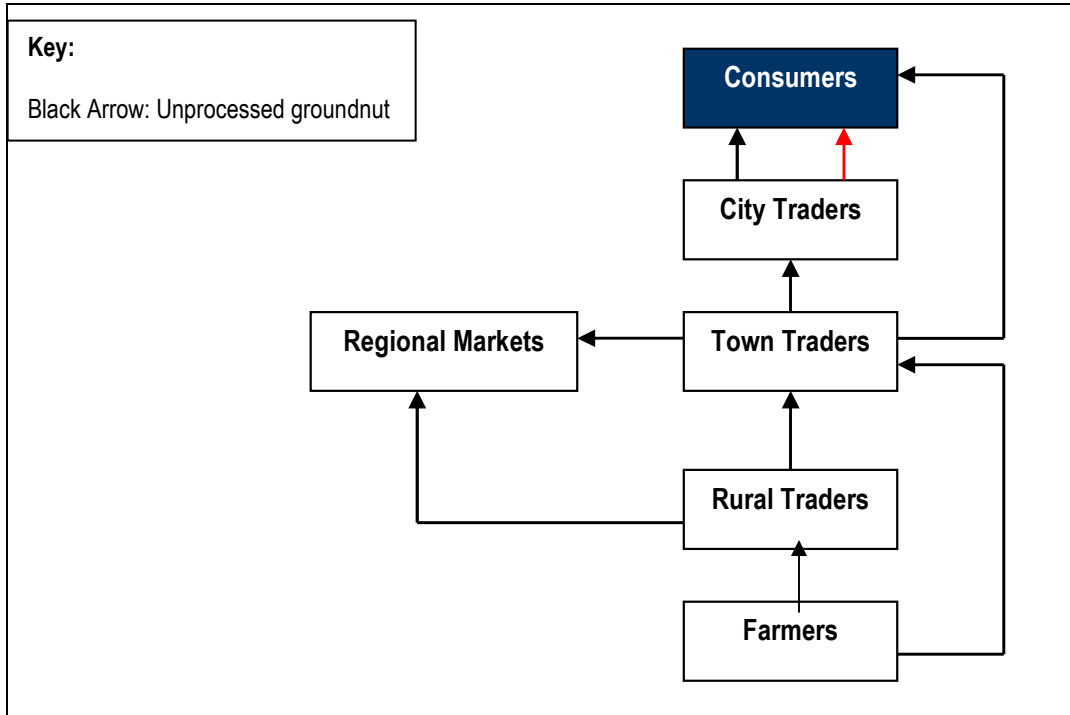
City Traders

City traders operate in Kampala, with their groundnut supplies coming from various parts of the country – primarily the main groundnut growing areas. The buying and wholesale prices in these places do vary according to the type of groundnuts. Red Beauty, for example, is sold at Shs 1,900 – 2,000 per kg; Serenut – at Shs 1,600 – 1,700 per kg. Thus, the city traders earn variable margins of Shs 300 – 400 and Shs 500 – 600, respectively.

Processors

Village-based hand mill processors, medium-sized oil millers, produce local oil with capacity of 5-6 MT per day and large processors process over 100 MT per day. Most oil millers crush soybeans, sunflower seed and until recently cottonseed, but do not utilize the 180,000 MT annual milling capacity. Currently, groundnuts and sesame are not crushed because of high market prices for raw materials.

Figure 12.1: The groundnut value chain in Uganda



Value Changes

Participants	Cost Items	Prices (Shs)	
		Minimum	Maximum
A. Rural Traders	1. Purchase of 1 kg of groundnuts	1,000	1,200
	2. Transport and cost of sack	50-60	50-60
	3. Total cost per kg	1,050 - 1,060	1,250 - 1,260
	4. Selling price per kg	1,500	2,000
	5. Profit per kg	450-460	1,050-1,060
B. Urban Traders	1. Cost of 1 kg of groundnuts	2,000	2,200
	2. Selling price per kg of No.2	2,500	2,700
	3. Profit per kg	500	500
C. Millers	1. Cost of 1 kg of groundnuts	2,500	2,700
	2. Milling costs	30-50	30-50
	3. Total costs for 1 kg groundnuts		
	4. Profit margin per kg of groundnuts		

12.4 CONSTRAINTS AND OPPORTUNITIES

The groundnut value chain in the country is constrained by various factors. These may be grouped into production and marketing constraints.

- Disease and pests:** The main diseases are rosette virus and early leaf spot. Groundnut rosette virus disease has been the most limiting factor of production. Other diseases include bacterial wilt, rust, and stem rot. The major insect pests are aphids, thrips, grubs, and termites. Storage pests include *Aspergillus*, moths, flour beetles, etc. Groundnuts are attacked by the bean leaf roller (*Lamprosema indicata*), Leafminer (*Stornopteryx subsecivella*), long-horned grasshopper (*Phaneroptera furcifera*), cotton leafhopper (*Empoasca biguttula*), slant-fac grasshopper (*Atractomorpha psittacina*), June beetles (*Leucopholis irrorala*), and Tiger moth caterpillar (*Dasychira mendosa*), etc.

Mould (*Aspergillus flavus*) can attack groundnut, leading to aflatoxin contamination, if the nuts are not dried sufficiently. Aflatoxin in peanuts is a serious problem. The peanuts can become infected either before or after harvest. Once they are infected, it becomes difficult to remove the aflatoxin and the peanut becomes dangerous for human consumption. If the peanut is free from the disease at harvest, correct drying can prevent later infection. Some aflatoxin infection can

be visible to the eye as mould, but in other cases it may not be seen. Laboratory tests need to be carried out to confirm the presence of aflatoxin. The recommended moisture level should be less than 10 percent.

- **Low levels of inputs:** As groundnut is grown mostly by small-scale farmers, the production is limited by low level of inputs.
- **Storage losses:** Cultivation of crushable materials at household level is low resulting into low oil mills capacity utilization and seriously limits local vegetable oil production. The need to increase crushable material supply is inhibited by high costs of production and low household profits attributed, among others, to low farm gate prices for oil seeds. The situation is exacerbated by storage losses on farm, lack of storage facilities at the mills and oil millers' inability to obtain adequate crop finance. Therefore, local supply of crushable materials is supplemented by substantial imports of crude palm and sunflower oils of about 70,602 MT.

PART C: THE BUSINESS ENABLING ENVIRONMENT FOR TRADE IN AGRICULTURAL COMMODITIES

13.0 THE POLICY ENVIRONMENT

13.1 PRICING AND MARKETING POLICIES

13.1.1 Status and Impact of Pricing and Marketing Policies

With the progressive liberalisation of Uganda's economy – a process which included trade – among others, price regulation was abandoned as a trade policy tool. Both domestic and international trade in all agricultural products has since remained in private hands. There are no more state trading companies operating in competition with the private sector or acting as major buyers and guarantors of a minimum farm-gate price. Similarly, price control as a development and trade policy measure is no longer practised by the government. All prices are determined by the market.

As a result of this liberal stance, there have been marked increases in production of most food and non-food agricultural items and many have increasingly contributed to the growing export base of the country, allowing diversification away from the traditional coffee, cotton, tea and tobacco. On the other hand, however, the liberalisation of the price and marketing policies has sometimes affected the smallholder farmers, whose livelihoods have been threatened in times oversupply, when prices tend to plummet. The absence of a single statutory buyer, as was the case in the past, has also resulted in the proliferation of middlemen who take advantage of smallholder farmers who have no bargaining power in the market. Further, the number of private operators, many of whom are small or even informal enterprises, has led to deterioration in quality in some instances.

13.1.2 Opportunities for Reform

The GOU has been steadfast in maintaining its current non-interventionist stance in regard to pricing and marketing of agricultural produce. But if the Prosperity-for-all strategy is to be felt by the smallholder farmer, then it will be necessary that the smallholder's bargaining power in the marketplace is strengthened. Many farmers are exploited because they produce so little, have no secure storage facilities and often are in a rush to sell in order to meet their immediate needs. There are, thus, opportunities to improve the farmers' lot by minimising on-farm losses and at the same time help improve quality of produce. This would also result in more produce being available for sale locally and on the regional markets.

13.1.3 Measures Needed

The following measures should be introduced to address the plight of farmers, minimise losses, improve quality and increase availability of produce:

- (i) Government should support and encourage farmers to embrace the old system of cooperative societies for both production and marketing. That would strengthen their bargaining power vis-à-vis the middlemen. The current SACCOs initiative is a good starting point.
- (ii) The warehouse receipt system should be streamlined and made attractive to smallholder farmers if they are organised into cooperatives. This would require a network of warehouses in the farming centres. Government could extend credits to local investors including farmer cooperatives (e.g. using the Bank of Uganda and Uganda Development Bank facilities) to set up such warehouses at county or even sub-county level.

13.2 REGIONAL STRUCTURED TRADING SYSTEM PLATFORM

13.2.1 The Food Balance Sheet

The food balance sheet presents a country's supply and demand for the main staple foodstuffs. The construction of the food balance sheet for Uganda represented in Table 13.1 below is based on the FAO format and on the assumption the FAO used in constructing the 2006 food balance sheet, namely:

- (i) The estimated 2008 population is 29.59 million.
- (ii) Over 85 percent of the calorie intake in Uganda is typically derived from cereals, roots and tubers, pulses, oil-seeds, and plantains. The balance comes from an assortment of fish, meat, eggs, milk, etc.
- (iii) The average per caput/annum consumption of food used in this exercise is as follows: cereals 80 kg; pulses 26 kg; roots and tubers 232 kg; Matoke (plantains) 161 kg. These figures are not norms based on any nutritional standards but have been derived from estimated apparent consumption in recent years. These estimates are used in the absence of more reliable data on consumption norms.
- (iv) Cereals considered here are: barley, maize, millet, rice, sorghum and wheat; pulses include beans, peas of all types, and soybeans; root crops and tubers include cassava (manioc), potatoes and sweet potatoes.
- (v) Average seeding rates as a percentage of utilisation are: 1.48% for cereals; 6.79% for pulses; 2.30% for roots and tubers.
- (vi) Estimates of crop production are "economic" production, i.e., allowance has already been made for post-harvest losses.
- (vii) Matoke (plantain), cassava certain pulses and Maize are used to a significant extent for feed and other purposes such as industrial use and local brewing. Average utilisation rates applied for this study are: 9.05 for cereals; 17.49 for pulses; 16.45% for roots and tubers and 49.16% for plantains.
- (viii) Imports usually include rice and small amounts of wheat.

Table 13.1: Uganda Food Balance Sheet (Jan – Dec 2008) ('000 Tonnes)

	Cereals	Pulses	Roots/Tubers	Plantains
Availability	2,716	1,149	8,449	9,371
Stocks Drawn Down	0	0	0	0
Production	2,716	1,149	8,449	9,371
Utilisation	2,839	1,149	8,449	9,371
Food	2,367	769	6,865	4,764
Feeds/Other Uses	257	201	1,390	4,607
Seed	42	78	194	0
Export	67	55	0	0
Stocks Build Up	106	46	0	0
Commercial Imports	123	0	0	0

Source: Derived from data in the UBOS Statistical Abstract, 2009 and FAO

The above data shows that generally the food supply situation in Uganda is good. In fact that is largely the case. But there have been reports of pockets of shortages in some areas particularly in the north and north east of the country occasioned mostly by prolonged drought. The internal marketing system in Uganda is underdeveloped and too focused on the Entebbe-Kampala-Mukono axis. This means that often there are surpluses in one part of the country and shortages in others. The very poor are particularly vulnerable to occasional food shortages that surpluses elsewhere cannot solve due to their low purchasing power.

Moreover, the World Food Programme continues to be active in Uganda although much of the food it distributes in the country is locally procured. WFP still reports that there are instances of chronic hunger among children including micronutrient deficiencies that the food balance sheet does not clearly bring out.

13.2.2 Warehouse Receipt System

This is a system of licensed warehouses by which warehouse owners hold goods in safe custody on behalf of depositors. The warehouse operator issues a “warehouse receipt” to the depositor and guarantees to deliver back the same quality and quantity of goods to the depositor or other legitimate holder of the receipt. The receipt is proof of ownership of the deposited produce and indicates the weight and grade of the goods at the time they were deposited. Only warehouses licensed by the Uganda Commodity Exchange (UCE) may issue receipts under the scheme.

The use of the WRS reduces the time taken to source commodities as every such receipt is listed on the WRS electronic system (eWRS) and on the UCE website. Once one is registered as a buyer, one gains access to these systems and can search and identify stocks available for sale. Stock can be bought on line. Payments for receipts (it is recommended) are paid for using the Bank of Uganda's Real Time Gross Settlement System. An additional advantage is that a holder of a receipt can use it to prove the existence of stock to a potential buyer or to a financial institution and used as collateral. Currently there are 3 licensed warehouses for grains in Uganda, namely: Agroways (in Jinja), Nyakatonzi Growers Cooperative Union (Kasese), and Masindi Seed and Grain Growers (Masindi).

The WRS has recorded some successes involving smallholder maize farmers. In Kapchorwa District for example, the USAID funded project Rural SPEED⁷, working with the Kapchorwa Commercial Farmers Association (KACOFA) has transformed the fortunes of the 2000 members or so of KACOFA.

The USAID-funded Rural SPEED project has, in collaboration with the World Food Programme (WFP), offered farmers Shs 350 per kilogramme of maize compared to the Shs 120 - 180 that was being fetched through normal quick sales. Based on the success with maize, the project is now examining the possibility of expanding the system to beans and barley both of which are now grown in the area.

One of the challenges facing the WRS is who has first call on the stored commodities when used for collateral purposes. First, there is the collateral manager and then the financial institution (FI). Because often the FI does not have the primary or first-lien position in the collateral management agreements, they (FI) sometimes demand secondary collateral from borrowers, who may find difficulty raising it. In addition, there have been teething problems relating to banks adjusting to lending on the basis of commodity stocks as collateral.

Producers, traders and bankers all need commodity pricing parameters in order to make appropriate credit decisions. Except at harvest when there is a strong cash market, price discovery in Uganda is difficult and unrefined. To meet the needs of the various interested parties, one alternative would be for someone (perhaps the UCE – see below) to develop a simulation of reference prices based on historical pricing information, the closest regional trading markets offering prices for comparable commodity qualities and quantities, and recent trends and demands from traders and buyers. Sensitivity analysis can then be applied to this information to determine how much of a “shock” borrowers and their lenders can absorb before adversely affecting the credit. All parties need to discuss the lessons learned so far and work to sort out the issues that have arisen thus far.

⁷ Rural Saving Promotion and Enhancement of Enterprise Development

13.2.3 The Commodity Exchange

The Uganda Commodity Exchange (UCE) was formed in 1998 as a member-based organisation. Membership comprises of stakeholders from the agriculture sector and from sectors and sub-sectors that support exports and the development of commercial agriculture in Uganda. The UCE is a company limited by guarantee under the Companies Act (Cap 110). The UCE's key role is to develop trade in agricultural products by:

- (i) facilitating procurement and marketing of products through the operation of an exchange trading floor and provision of reliable and timely market information.
- (ii) keeping producers as well as buyers and users of agricultural commodities informed about market volumes and the availability of supplies of and markets for graded produce; and
- (iii) regulating the Warehouse receipts System.

The physical trading in commodities takes place at the WRS level with the UCE mainly concentrating on the above activities. These activities are affected by the slow development of the ICT in the country, although admittedly there has been tremendous growth in recent years. However it is clear that though the coverage of mobile telephony (one of the mediums for information gathering and dissemination) is fairly wide, the same cannot be said about internet technology that remains mostly an urban luxury and so of little relevance to the rural farmer.

14.0 THE REGULATORY FRAMEWORK

14.1 CUSTOMS DOCUMENTATION AND CLEARING PROCEDURES

Uganda has a liberal trade regime. For example, there is no need for an import or export license for most products traded internationally. However, phytosanitary clearance is necessary for the agricultural products under consideration in this report (see section 15.3). A phytosanitary certificate issued by a competent authority is required for the movement across the border of seeds and planting materials.

To clear goods through customs, a “customs entry” must be presented for every consignment. The entry is a form that gives details (e.g. description of goods, weight, value, country of origin, country of destination, consignee, etc). In addition, other documents required are: a commercial invoice, a bill of lading or an airway bill, (and, depending on the country of origin/destination of the goods), a certificate of origin may also be required. As stated elsewhere, for agricultural produce subject to a compulsory standard, consignments must be accompanied by a quality certificate (by UNBS for exports and a foreign standards agency for imports). All firms operating as exporters or importers are required to be registered with the Uganda Registration Bureau. Proof of such registration is a certificate of incorporation or of registration. Copies of the certificate should be handy to forestall any hold-up in customs processing.

On the basis of the customs entry and certificate of origin, import duties and VTA will be computed. In theory, valuation is based on the transaction value as provided for by the WTO Agreement on Implementation of Article VII of GATT 1994. However, the authorities indicate a number of problems in implementing the Agreement, including difficulties in obtaining information (for valuation purposes) from foreign sources, falsification of documents, and issuance of dual or blank invoices by suppliers. No minimum prices are used, but a valuation database has been established for purposes of reference and application of alternative valuation methods. The Customs and Excise Department of the Uganda Revenue Authority (URA) is responsible for collecting all duties on imports. According to the URA, average clearance time for imports is between two and three days.

Because URA mostly resorts to alternative methods of valuation, there is a specific procedure for valuation appeals. The importer/agent appeals to the head of station where the value was set. The head discusses the issue with the valuation officer, and, if the decision does not satisfy the importer/agent, they can appeal to the officer in charge of the region, at the level of Assistant Commissioner. There is still a right to appeal to Headquarters valuation section. The final stage is the Tax Appeals Tribunal. A similar process applies to classification and interpretation appeals.

14.2 STANDARDS

14.2.1 Specification

The Uganda National Bureau of Standards (UNBS) is responsible for the overall management and coordination of standardization activities in Uganda. It is also Uganda's enquiry point under the WTO Agreement on Technical Barriers to Trade (TBT). UNBS also chairs the National TBT/SPS Committee, an institutional, multi-sector committee consisting of regulatory and private sector organizations responsible for the implementation of the TBT and SPS Agreements at the national level. Uganda has accepted the WTO Code of Good Practice for the Preparation, Adoption and Application of Standards. UNBS is also Uganda's coordinating agency for the harmonization of standards at the EAC level.

The UNBS publishes a catalogue of standards annually some of which are compulsory and others voluntary. The publication also includes lists of withdrawn and draft standards. Uganda's standards do not distinguish between imported and nationally produced goods. The standards information in respect of any one product is available at the UNBS for a fee of US\$ 15,000.

The UNBS has developed/adopted standards for all the products under this study, namely: barley, beans, cassava and cassava flour, maize and maize flour, millet and millet flour, rice, sorghum and sorghum flour, and wheat and products made from wheat. These standards, like all UNBS standards for food items are compulsory.

14.2.2 Application for Imports and Exports

The Import Inspection & Clearance regulation is contained in a statutory instrument signed by the Minister of Tourism, Trade and Industry (MTTI) on 21st October, 2002. UNBS has put in place an Import Inspection and Clearance Scheme. The scheme requires all imported products whose standard specifications were declared compulsory under the provisions of UNBS Act 1983 to be inspected for conformity to the relevant Ugandan Standard by UNBS before release onto the Ugandan market. Quality inspection is done by UNBS at the entry point during the customs verification exercise.

In practice, any item covered by a compulsory standard, when imported or presented for sale or for trade, must conform to the parameters specified in the standard. In the case of imports, every consignment must be accompanied by a quality certificate from the competent authority in the country where the goods originate.

On arrival at the customs entry point, a Standards Officer takes samples of the goods and proceeds to verify that the goods in question conform to the stated parameters in the accompanying quality certificate and that such parameters meet the national (UNBS) standard. This process takes a maximum of 7 days during

which time the consignment is held at the border or released under UNBS seal to the consignee's warehouse. Only after UNBS verification will the customs authorities release goods onto the market. In case the product is to be exported, the UNBS again takes samples, analyses them to ensure conformity to the standard and if satisfied, issues a quality certificate without which, the Uganda Export Promotion Board will not clear the goods for exportation.

14.3 SANITARY AND PHYTO-SANITARY REQUIREMENTS

14.3.1 Specification

The Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF) is the national enquiry point for all SPS-related issues. The Food and Drugs Act (Cap 278), the Public Health Act (Cap 281), the Plant Protection Act of (Cap 31), and the Agricultural Seeds and Plant Act (Cap 28) are Uganda's main SPS-related legislation. The Adulteration of Produce Act also regulates how produce should be presented for sale to the public.

14.3.2 Application for Imports and Exports

The MAAIF is responsible for phytosanitary controls and for matters relating to seeds. The same corps of inspectors is empowered to enforce regulations for both these areas. To prevent the introduction of infectious diseases, the MAAIF may restrict the entry of any person, animal, plant or plant part under the Public Health Act, and impose requirements or conditions (medical examination, detention, quarantine, disinfection, or isolation). The MAAIF is empowered to make regulations or orders regarding the manufacture, importation, storage and sale of foods, including prohibitions on products that are not clean, wholesome, and free of diseases. No plant or part of a plant can be imported without a permit from the MAAIF. Soil imports are prohibited. All imports of plants and seeds are subject to quarantine regulations and may enter only through one of the 22 designated ports.

14.4 TRADE (IMPORT AND EXPORT) RESTRICTIONS

As noted above Uganda's international trade regime is very liberal, and most products are imported or exported without quantitative or origin restrictions. There has been no recent history of banning importation or exportation of agricultural products, even though there have been (unheeded) calls for bans on exports of foodstuffs during periods of droughts, shortages in some parts of the country, and escalating price rises.

14.4.1 Import Restrictions

Apart from the restrictions and controls attendant to standards and SPS regulations, Uganda has a list of prohibited or controlled imports. None of the products under study here is subject to any importation restrictions, and the country's only other trade regulating measures are tariffs.

14.4.2 Export Restrictions

Similarly, Uganda restricts export of certain agricultural products, but none of these is the subject of this study. There are also no export tariffs.

14.5 TARIFFS, NON-TARIFF CHARGES AND NON-TARIFF BARRIERS

14.5.1 Tariffs

Uganda's tariff bindings cover 15.9% of all its tariff lines, including all tariff lines for agricultural products (WTO definition). The bindings are at ceiling rates of 80% on most agricultural products, except for 75 tariff lines with bound rates between 40% and 70%. The dutiable value for imports is the c.i.f. price of the imported good at the point of entry to the EAC customs union.

According to the WTO, Uganda's average MFN tariff in agriculture is 17.3% (2006), with rates ranging from zero to 100%. It is estimated that the average tariff on grains is 28.3%.

Table: 14.2: Summary of Import Duties

HS	Description	CET
07.08	Leguminous vegetables, shelled or unshelled, fresh or	
0708.10.	Peas (<i>Pisum sativum</i>)	25
0708.20.	Beans (<i>Vigna spp, Phaseolus spp</i>)	25
0708.90.	Other Leguminous Vegetables	25
07.10	Vegetables, uncooked or cooked by steaming or boiling	25
0710.21.	Peas (<i>Pisum sativum</i>)	25
0710.22.	Beans (<i>Vigna spp, Phaseolus spp</i>)	25
0710.29.	Other	25
07.13	Dried leguminous vegetables, shelled, whether or not	
0713.10.	Peas (<i>Pisum sativum</i>)	25
0713.20.	Chickpeas (garbanzos)	25
0713.31.	Beans of the species <i>Vigna mungo (L.) Hepper</i> or <i>Vigna</i>	25
0713.32.	Small red (Adzuki) beans (<i>Phaseolus</i> or <i>Vigna angularis</i>)	25
0713.33.	Kidney beans, including white pea beans (<i>Phaseolus</i>)	25
0713.40.	Lentils	25
07.14	Manioc, arrowroot, salep, etc. ... fresh, chilled, frozen or dried, whether or not sliced, or in the form of pellets; sago pith.	
0714.10.	Manioc (cassava)	25
10. 01	Wheat and meslin	
	Durum wheat	
1001.10.	Specially prepared for sowing	0
1001.10.	Other	0
1001.90.	Specially prepared for sowing	0
1001.90.	Hard wheat	35

1001.90.	Other	35
10.30	Barley	
1003.00.	Barley, specially prepared for sowing	0
1003.00.	Barley, other	25
10.50	Maize (Corn)	
1005.00.	Maize, seed	25
1005.90.	Maize, other	50
10.06	Rice	
1006.10.	Rice, in the husk, paddy or rough - \$200 per MT or 75%	
1006.20.	Rice, husked (brown) - \$200 per MT or 75% whichever	
1006.30.	Semi-milled or wholly milled rice, whether or not polished	
00	or glazed - \$200 per MT or 75% whichever is higher	
1006.40.	Broken rice - \$200 per MT or 75% whichever is higher	
10.07	Sorghum	
1070.10.	Grain sorghum	25
10.08	Buckwheat, millet, canary seed, other cereals	
1008.20.	Millet	25
1101.00.	Wheat or meslin flour	60

Source: EAC Common External Tariff, 2007 Version.

Uganda grants tariff preferences (on a reciprocal basis) to Burundi, Kenya, Rwanda and Tanzania under the Protocol on the Establishment of the EAC Customs Union and to members of the COMESA. The preferential bands applied by Uganda under COMESA are 0%, 4%, and 6% for inputs, intermediate goods, and final goods, respectively.

A value-added tax (VAT) is levied at a standard rate of 18% on the sale price of locally produced goods and services and on the customs-duty inclusive of c.i.f. value of imports. VAT is zero-rated for a number of goods and services including: seeds, fertilizers, pesticides and hoes, locally produced cereals and agricultural equipment. VAT exemptions apply to unprocessed food and other agricultural products and animal feeds. Companies with a turnover of below Shs 50 million are exempted from registration requirements for VAT purposes.

Excise duties are payable on alcoholic beverages among other manufactured products. The excise tax applies to the customs-duty-inclusive c.i.f. value of imports and to the sale price of locally produced goods. Excise duty on local beer and wine produced using domestic sorghum and barley is considerably lower than on similar imported products.

A withholding tax of 6% on the c.i.f. value of imports is collected from companies that have not submitted income tax declarations. This is a deposit on income tax and is taken into account at the end of the fiscal year.

Table 14.3: Partial Schedule of Excise Taxes

Duty	Rate
(i) Beer	
(a) Made from malt	60%
(b) Whose local raw-material content, excluding water, is at least 75% by weight of its constituents	20%
(ii) Spirits	60%
(iii) Wine	
(a) Made from locally produced raw materials	20%
(b) Other	70%

Source: WTO, Trade Policy Review of East Africa

Exports from Uganda are not subject to tariffs as a measure designed to encourage export diversification. But in the production and preparation of exports, enterprises may be required to pay certain taxes on inputs (import duties, VAT, excise tax etc.). Enterprises in these situations are encouraged to keep meticulous records so as to benefit from the government’s duty draw back scheme that exporters are entitled to.

14.5.2 Non-Tariff Charges

There are no known formal charges that the agricultural products under this study are directly levied apart from the costs of certain services/documentations that the import or exportation process may require, including costs for verifying conformity with the quality standards and SPS verification. Also since all government taxes must be paid into a URA bank account, the banks do charge a small fee for receiving the money. Each single payment attracts this charge so that if an importer makes multiple payments for the same consignment (as often happens) then the charge increases.

14.5.3 Non-Tariff Barriers

Non-tariff barriers are measures, charges, impediments etc. that are placed in the way of trade to restrict or in some way to disrupt and disadvantage imported goods vis-à-vis local competing products. Other NTBs may be less deliberate such as poor infrastructure (roads, railways, bridges, etc.). In Uganda the latter are particularly important. The country being land-locked, suffers from its removal

from the coast, and the internal road network, especially the rural feeder roads can increase costs considerably particularly during the rainy seasons.

Importers from certain countries and of certain products may need to produce certificates of origin, but these are solely for purposes of conferring preferences and not to restrict trade.

Corruption and corrupt tendencies that may be manifested in tardiness or absence of customs and other officials, deliberate lack of transparency in procedures, direct demand of bribes, road blocks on highways used to extort bribes are some of the malpractices that one often reads about being cited. These when they occur do contribute to raising the cost of imports.

14.6 LOCAL REGULATIONS

Uganda is divided into over 80 administrative districts and each urban authority in the district is responsible for collecting a trading licence which every enterprise is expected to pay annually. The fees are fixed in consultation with but cannot be said to impact directly or significantly on the cost of imports or exports. In addition, enterprises are expected to have a produce buyer's licence to operate in an area. It is not uncommon for several districts to require a produce buyer's licence from the same enterprise operating across districts.

PART D: ASSESSMENT AND WAY FORWARD

15.0 CONCLUSIONS, POLICY IMPLICATIONS AND RECOMMENDATIONS

15.1 MAIN CONCLUSIONS

On the basis of the analysis in the preceding we make the following conclusions:

1. While Uganda's agriculture sector has shown some dynamism in its growth, it is nonetheless facing a number of constraints, including lack of efficient and cost-effective technology, low rates of adoption of appropriate technology, lack of finance, a complicated land tenure system, information constraints, weak farmers' organisations, lack of market information, high post-harvest losses, environmental degradation, etc. Government introduced a number of interventions, including provision of extension services through the NAADS programme. However, overall the absence of a clear agriculture policy to guide the sector's development is a binding constraint on its growth.
2. The commodities analysed above affect the livelihoods of many Ugandans. They are not only staple foods for a great many of them, but they sources of income, employment, among others. Unfortunately, in most cases the current market players are not yet in position to create market intermediation to help the small farmers, who may not benefit much from the market supply chain. In some cases, the middlemen continue to exert influence on the market prices.
3. Nearly all the commodities analysed in this report have serious problems in their value chains which need to be addressed. The most common constraints include the high cost of, or lack of basic inputs, inefficient marketing systems, lack of storage, post have losses, poor infrastructure, limited or lack of access to credit, inadequate market information, lack of processing capacity, etc. These constraints affect the all the various stakeholders in the value chain.
4. The value chains of the above commodities have potential of expanding markets in the region, especially if there are incentives for investment in these sectors over the long term. They also provide the context for the government, working with the EAC and COMESA member states to address institutional and other constraints to regional trade and investment in agricultural commodities. Unfortunately, however, some of the commodities analysed (such as peas, barley, millet, etc) are not optimal enough to provide economies of scale to deliver competitiveness gains.
5. Trade in most of the above commodities is taking place in unprocessed form. There is limited processing capacity and as a consequence the country (and

the farmers) is losing the opportunity to earn higher incomes from export of these commodities. This points to the need to add value to the traded agricultural commodities.

15.2 RECOMMENDATIONS

The main recommendations arising from the above analysis are:

- (i) ***Addressing the various constraints in the value chain:*** The challenges and constraints on the various stages of the value chains need to be addressed. This will call for concerted effort by the Government working with development partners to resolve them. Specifically, there is need to improve the transport infrastructure to enable farmers reach market, provide market information, provide extension services on a sustainable basis, etc.
- (ii) ***Increased funding of the agriculture sector:*** The funding of the agriculture sector is awfully inadequate. The level of current funding cannot meet the obligations taken on as a result of embracing liberalization. Liberalization of markets comes with challenges and obligations and many of these cannot be undertaken by the private sector alone. As a matter of principle therefore, Government should consider increasing substantially the level of funding of the agriculture sector, given the significance of the sector in the economy. Such funding should be directed in areas such as land reform, provision of extension services, development and improvement of infrastructure (such roads, irrigation schemes, valley dams, etc), institutional reforms in the agricultural sector (e.g. strengthening the capacity of the Ministry of Agriculture and its related agencies), research and development (including pest and disease control, development of pest-resistant or high-yielding varieties of crops, etc). This study would recommend an increase of up to 15% of total Government spending on the agriculture sector.
- (iii) ***Promotion of large-scale commercial agriculture:*** The future of agriculture in Uganda cannot be left to smallholder producers alone in light of the problems discussed in the various value chains above. It is important that efforts are made to promote large-scale agricultural production. This will not be easy or even possible in the short-term, especially given the problems associated with land tenure in the country. However, a beginning must be made. It is important that as a start, Government identifies a few leaders – lead farmers - who are ready to embrace large scale farming in each district or region. These should be supported especially with inputs, extension services, input credit, etc. In order to encourage and support the smallholder farmers, contract farming should be encouraged with such lead farmers as the nuclei.
- (iv) ***Promotion of producer organizations:*** In a free market, a producer organization is a member-owned, transparent, democratically operated, private sector group or enterprise, which is organized and managed by its

members to meet the economic needs of its members. Such an organization provides needed services and products (or links to providers) in rural areas. It promotes and represents the interests of its members and enables them to have a stronger bargaining position and reduces transaction costs than they would have as individual producers. Such producer organizations would be in form of cooperatives in the agricultural sector, which Government has planned to revive. This Government intention is welcome and should be supported. Cooperatives must be seen as an important vehicle for reducing poverty in the rural areas. Often, however, these cooperatives lack the organizational skills and managerial capacity to fulfill this role. Government should help to create this capacity through training.

- (v) ***Strengthen investment in public goods:*** Government has already invested a lot in physical infrastructure, such as roads and the utilities. This is commendable, although a lot still remains to be done. More should be done in this regard especially in rural areas particularly in facilities that improve the logistics of commodity production, storage and irrigation, as well as marketing capacities.
- (vi) ***Provision of input credit to farmers:*** Access to credit by farmers is one of the key obstacles to the development and expansion of agriculture in Uganda. Lack of bankable collateral and the high interest rates are some of the major difficulties. In spite of the growth of microfinance in Uganda and the expansion of its outreach to rural areas farmers are still not able to borrow to purchase inputs. There is therefore need to help producers with provision of input credit. In this regard, input and output markets should be linked and contracts enforced to make credit available to farmers. The needed institutional frameworks for these actions would include traders' associations; contract farming such as is already practiced in the case of cotton and tobacco, and farmers' organizations.
- (vii) ***Streamlining the warehouse receipt system:*** The warehouse receipt system should be streamlined and made attractive to smallholder farmers if they are organised into cooperatives. This would require a network of warehouses in the farming centres. Government could extend credits to local investors including farmer cooperatives (e.g. using the Bank of Uganda and Uganda Development Bank facilities) to set up such warehouses at county or even sub-county level.

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