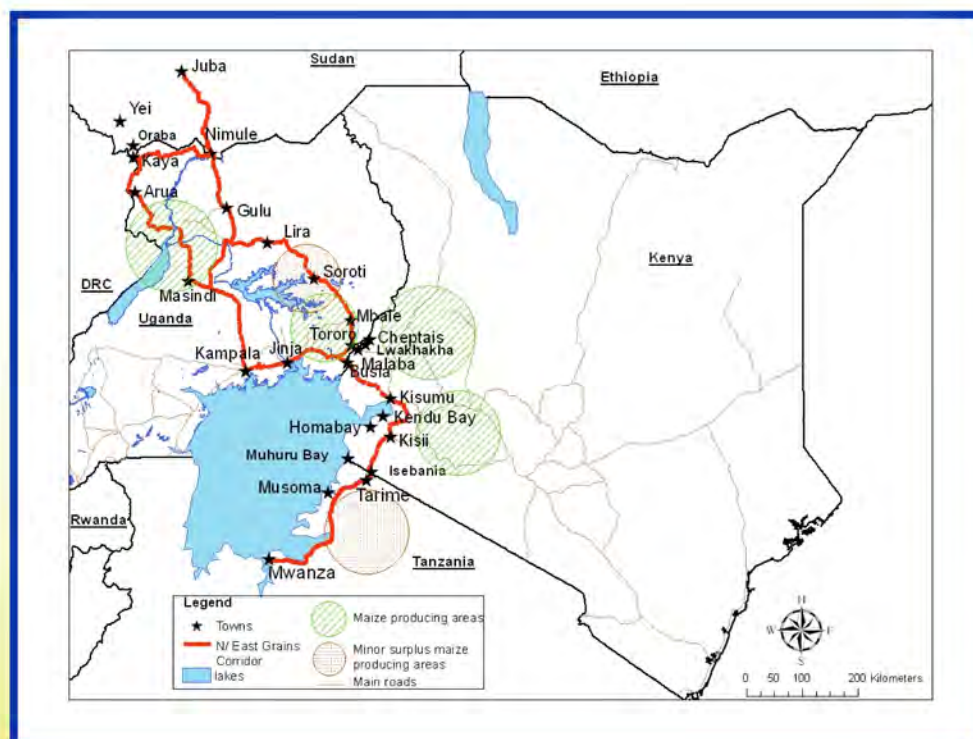




Nile Basin Initiative

ANALYSIS OF CROSS BORDER TRADE IN AGRICULTURAL PRODUCTS ALONG SELECTED CORRIDORS OF THE NILE BASIN





Analysis of Cross-border Trade in Agricultural Products along Selected Corridors of the Nile Basin Region



Project Contacts:

NILE BASIN INITIATIVE

NELSAP/ Regional Agricultural Trade and Productivity Project

Bujumbura-BURUNDI

Quartier KIGOBE SUD

KIGOBE Main Road, Plot No: 7532/C

Box: 4949 Bujumbura, Burundi

Tel: Office: + (257) 22275602 / 22275603

Contacts:

Innocent Ntabana

Email: intabana@nilebasin.org

Helen Ommeh-Natu

Email: hnatu@nilebasin.org

M. A. CONSULTING GROUP

6th Floor International House, Mama Ngina Street

P.O. Box 73335-00200 Nairobi, Kenya

Tel: 254-20-2227834

Website: www.magricon.com

AND

RESOURCE MANAGEMENT AND POLICY

ANALYSIS INSTITUTE (REMPAI)

Chiromo Rd, Chiromo Court, Samburu Suite No.3

P.O. Box 63806-00619 Nairobi, Kenya

Tel +254 (0)20 374 5653, direct +254 (0)20 374 7076

Website: www.rempai.com

Contacts:

Mwaniki Ngure, Email: nmwaniki@magricon.com

Chris Ackello-Ogutu, Email: chris.ogutu@rempai.com

John Mburu, Email: john.mburu@rempai.com

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Abbreviations and Acronyms

AfDB	African Development Bank
ASAL	Arid and Semi-Arid Lands
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
AU	African Union
CAADP	Comprehensive African Agriculture Development Program
CBO	Community Based Organization
COMESA	Common Market for Eastern and Southern Africa (COMESA/CU)
EAC/CU	East African Cooperation/Customs Union
EAGC	East African Grain Council
EU	European Union
FAO	Food and Agricultural Organization
FEWS	Famine Early Warning System (FEWSNET)
FTA	Free Trade Area
GDP	Gross Domestic Product
GIS	Geographical Information System
HCA	Horticultural Council of Africa
HYV	High Yielding Varieties
IBAR	Inter-African Bureau for Animal Resources
ICT	Information and Communication Technology
ILRI	International Livestock Research Institute
IRRI	International Rice Research Institute
IUCN	International Union for the Conservation of Nature
KIPPRA	Kenya Institute for Public Policy Research and Analysis
LLPs	Livestock and Livestock Products
MDG	Millennium Development Goal
NGO	Non-Governmental Organization
MTP	Medium Term Plan
NEPAD	New Economic Partnership for African Development
NILESAP	Nile Equatorial Lakes Subsidiary Action Program
NTBs	Non-Tariff Barriers
RATES	Regional Agricultural Trade Expansion Services
RATP	Regional Agricultural Trade and Productivity project
RECs	Regional Economic Cooperation (Institutions)
REDSO	Regional Economic Development Services Office
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
SADC	Southern Africa Development Cooperation
SAPs	Structural Adjustment Programs
SPS	Sanitary and Phytosanitary Standards
SWOT	Strengths, Weaknesses, Opportunities and Threats
TBT	Technical Barriers to Trade
UBOS	Uganda Bureau of Statistics
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
WBCSD	World Business Council for Sustainable Development
WHO	World Health Organization
WTO	World Trade Organization

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MA Consulting Group

& Resource Management and Policy Analysis Institute (REMPAI)

Executive Summary

1. Objectives

The Nile Basin region comprises nine member countries, namely: the Democratic Republic of Congo (DRC), Rwanda, Burundi, Uganda, Tanzania, Kenya, Ethiopia, South Sudan, Sudan and Egypt). Over 60 percent of the region's poor households derive their livelihood primarily from agriculture. For these households, increased agricultural productivity and trade offer the best means of raising income, ensuring adequate food consumption, and accumulating the assets necessary to survive periodic shocks such as droughts and floods. The region has a broad agro-ecological and economic diversity which, together with a huge population of about 380 million people, offer considerable potential for consumer demand and intra-regional trade. Although many governments are reorienting their economies towards more open market regimes, the region's agricultural productivity and cross-border trade are yet to enter a stable growth path and resilience to the impacts of global markets and climate change.

Achievement of broad based and sustainable economic growth in the region has been elusive largely due to challenges relating to: the poor state of infrastructure; underdevelopment of agriculture arising from low investments in the sector, low use of productivity enhancing inputs, particularly improved seeds and fertilizer, and over-reliance on rain-fed production; policy related issues such as low institutional capacity for implementation, corruption and policy reversals; persistence of non-tariff trade barriers; vulnerability to external shocks; and, poor coordination of preparation and response to natural disasters.

This project was designed to assess and analyze the trade flows for three commodity clusters in five trade corridors: grains (Tanzania-Burundi-DRC and Tanzania-Kenya-Uganda-South Sudan corridors), fruits and vegetables (Burundi-Rwanda-Uganda-Kenya corridor) and live livestock (Ethiopia-Kenya and Ethiopia-Sudan-Egypt corridors). The aim of the project was to highlight the opportunities and constraints to trade and their determinants such as types of infrastructure, commodity attributes (e.g. structure and distribution of production and consumption), market structure and policy/regulatory actions.

2. Methodology

The main tasks in the field survey revolved around the following specific objectives:

- Analysis of how markets the selected commodity clusters function
- Evaluating the potential for cross-border trade
- Estimating the level and nature of marketing costs along the selected corridors
- Identifying constraints to cross-border trade and determining their relative importance
- Giving recommendations on policy actions and potential investments to address the identified constraints to trade

The tasks undertaken can be divided into three categories. The first category was mainly literature review leading to documentation of commodity production trends; structure and distribution of regional production and consumption; estimates of formal trade volumes; and, developing the trans-boundary maps for production and consumption. The second category was field-based and required administration of structured questionnaires and focus group discussions in order to achieve the following: characterization of the selected trade corridors; monitoring informal trade in key border posts over a designated period of time (as a basis for projecting annual informal trade flows); and, determining the major value chains in the selected trade corridors.

The last task derived from the second, namely: describing the roles of the value chain players and their constraints such as transport and storage costs; NTBs and their implied costs; and other transaction costs for both formal and informal traders. Similarly, deriving from field work, the study was able to articulate the roles of different agencies and potential investments to address the identified constraints.

3. Main Findings

3.1 Production, Consumption and Trade Patterns

3.1.1 Grains corridors

The grains cluster comprised maize, beans and rice. Despite efforts made to ensure food security in the region, cereals production generally, and maize supply in particular, continues to fall short of consumer demands thus necessitating imports. Although Egypt and Ethiopia lead in terms of maize production, they are also, in the same order, the largest consumers of this staple. Productivity of maize in the region is low due to low application of fertilizers, low quality seed and lack of proper husbandry practices that would enable achievement of 7-8 tons/ha experienced in Egypt. Egypt is also by far the largest producer and consumer of rice in the Nile Basin; the other major producers being Tanzania, Uganda, Burundi and Rwanda. The FAO statistics indicate that the production of dry beans in the Nile Basin is dominated by Tanzania (over 800,000 tons per year) followed by Uganda, Burundi, Rwanda, Kenya and Ethiopia.

The study shows that cross border trade plays a crucial role in fighting food insecurity by creating employment and reducing supply variability in the deficit countries (e.g. in Kenya and South Sudan in the case of maize). Production and trade in rice and maize was mostly done by both adult male and female persons whereas trade in beans was dominated by women. In the markets, young women constituted the largest proportion of informal traders of grains and pulses but they did not own the businesses.

The key production constraints are poor market infrastructure, lack of post harvest handling and storage facilities, and expensive fertilizers and other inputs. The trade constraints, including tariff and non-tariff barriers, are high tax rates (different countries with different taxes), official corruption and many road blocks, lack of market information and information centers, lack of standard units of measurement of bags, frequent government bans and lengthy process in obtaining trade permits (particularly in Tanzania), differences in axle load limit requirements, multiple and independent regulating institutions, harassment by policemen especially when they are not bribed, and high costs of transport. The costs associated with many of these impediments to trade have been evaluated and reported in this report.

3.1.2 Fruits and vegetables corridors

The commodities studied under this cluster were passion, Irish potatoes, pineapples and banana. Production of fruits and vegetables in the Nile Basin region has generally experienced an expansion in the last decade due to favourable international prices and changes of consumption behavior/patterns among the working class. This latter factor has contributed to increased cross border trade among the Basin countries. Banana production in the Basin is dominated by Uganda, whose 2010 production was above 10 million tons/year, followed by Tanzania which has also been the leading consumer in the Basin. For the passion fruits, Kenya is the dominant producer followed by Burundi and Rwanda. The fruits are mainly consumed in Uganda though some are already being exported to Europe. Likewise, Kenya is the leading producer of pineapples in the region with an average production share of 61% (mainly from plantations) in the last ten years. It is followed by the Democratic Republic of Congo

(DRC) with an average share of 26%. However, in terms of small-scale production, DRC leads followed by Uganda which is a leading exporter of the commodity to Kenya (the leading consumer in the Basin). The leading producer of Irish potatoes is Egypt, followed by Rwanda. Most of the Irish potatoes produced in these countries were consumed at home though some were exported through cross-border trade mainly to Uganda and South Sudan. The study found that women dominate the retailing businesses of fruits and vegetables in all the markets of the corridor. However brokers are mainly young men in all the markets and transport is mainly done by male youths of 25-35 years since they have the required strength.

The production constraints and trade impediments identified in this report are similar across the study commodities and corridors. The key production constraints are lack of certified seeds or planting materials, diseases such as potato blight, lack of storage facilities in the farms, poor roads, expensive inputs such as seeds and fertilizers, lack of agro-processing capacity, lack of access to loans, price fluctuations between seasons, and lack of standards leading to legitimization of opportunism by brokers and traders. Key trade impediments among the cross-border traders include poor road and market infrastructure, lack of packaging standards, and lack of storage facilities in the markets.

The adverse effect of these trade impediments is exacerbated by numerous and persistent tariff and non-tariff barriers which include different levels of taxation (lack of common tariffs on both sides of a particular border); multiple tax collectors who do not issue (genuine) receipts; local taxes instituted at unofficial crossing points, e.g., the local councils' barrier points; 'facilitation' fee (bribery) paid to government officials; and women being subjected to violence, threats and sexual harassment.

Despite the presence of these constraints, informal and formal cross border trade creates employment opportunities to local border communities, for example to work as brokers, retailers, transporters. Cross-border trade has been useful in providing income for purchasing food commodities that are not available in a particular country at different times of the year thus improving food security. Trade also offers opportunities for promoting efficient use of Nile water in terms of supporting transport, irrigation and wet agro-processing but the potential is yet to be tapped fully due to lack of equipment, infrastructure and technical skills.

3.1.3 Livestock corridors

Two live livestock corridors were surveyed: corridor 1 comprised Kenya/Ethiopia and Western Ethiopia/Eastern Sudan border points while corridor 2 involved Sudan/Egypt border points. The survey involved four livestock species, namely cattle, camels, goats and sheep. Sudan had the highest population of livestock with 40.7 tropical livestock units (TLU) while Ethiopia, Kenya and Egypt had 34.2, 12.8 and 4.0 TLU, respectively. Sudan had the highest population of camels, goats and sheep while Ethiopia had the highest cattle population of about 42.8 million head between 1999 and 2009. Egypt is the largest consumer of bovine meat in the region at about 650,000 tons per year followed by Ethiopia, Kenya and Sudan at 250,000, 240,000 and 210,000 tons per year, respectively.

There is a thriving cross-border trade in live livestock along the two corridors. For instance, 47,985 head of cattle, sheep, goats and camels valued at US\$ 6.6 million were traded annually between Kenya and Ethiopia. In corridor 1, cattle, sheep and goats flowed from southern Ethiopia to Kenya while camels moved in the opposite direction. Cattle moved from the Amhara Region in western Ethiopia to eastern Sudan through Metema/Galabaat border point while sheep and goats went in the opposite direction. In corridor 2, camels, sheep, goats and cattle flowed in a one way direction from Sudan to Egypt through Wadi Halfa border point. Some livestock also moved by the Red Sea road to Cairo. The main consumption points were the major cities in the region: Nairobi, Mombasa, Addis Ababa, Khartoum and Cairo.

Cross-border trade in live livestock employs a large proportion of the population (estimated by FEWSNET, 2010 to be around 17 million) including livestock producers, traders and other groups such as trekkers, fodder traders, brokers and intermediaries. Women are mainly involved in marketing of livestock products such as hides, skins, milk and ghee and not in live livestock trade.

The main barriers to cross-border livestock trade include lack of water supply (for drinking as well as for the production of pasture) due to frequent drought and effects of climate change; lack of marketing infrastructure such as holding grounds, watering points and troughs, feed barns, loading ramps, treatment/vaccination crushes, and isolation facilities; lack of marketing information; poor road and telecommunication infrastructure; rent-seeking/trader harassment by government officers along the trade routes; multiple taxation by local authorities in different States (in Sudan), and the ongoing civil conflicts in Darfur, Kordofan and Somalia.

3.2 Estimates of Marketing Costs

3.2.1 Storage and capital costs

The most popular on-farm forms of crop storage are improved structures and rooms in residential houses. Retailers and wholesale traders store predominantly in open holding grounds suggesting that there are no permanent storage facilities at these levels. However, processors appeared to be using improved storage structures because their operations were generally larger compared to those of farmer/traders and retailers.

Producers reported relatively higher post-harvest losses ranging from about 2.6 percent for rice and maize to 4 percent for beans compared to traders whose losses were highest for maize at about 2.2 percent. On average, formal traders registered higher losses (US\$ 2.5 per ton) compared to informal traders (US\$ 1.8 per ton) and the value of beans lost was the highest across the board. The highest storage related post-harvest losses were registered for maize, or about 11 percent of total farm production, compared to losses for beans that were estimated at only about 5 percent. In value terms, however, losses for beans were higher at about US\$ 44 per ton compared to US\$ 22 per ton for maize.

Storage structures in market centers fetched higher premiums due to their scarcity value compared for example to traditional stores and improved structures whose available capacities were much higher. Most of the storage infrastructure was self-owned and managed by men.

3.2.2 Transport

The prevalent modes of transport for crops by producers were small and big trucks, which also was the case for beans. However, traders and retailers preferred to use human transport for beans. Use of small trucks and bicycles was common in rice transportation by producers while traders and retailers preferred human transport.

There were three main modes for transporting livestock depending on the stage along the production chain. Trekking that often cover long distances taking several days, was the only form of transport at the producer stage and was handled exclusively by male youth. Trekking was also prevalent between primary and secondary markets after which road trucking (using 24 or 45 cattle head capacity trucks) takes over almost exclusively as the stocks headed to the tertiary markets.

The cost of transporting livestock depended on a number of factors including mode of transport, volumes per delivery, status of the road and distance to be covered. Trekking was found to be the most stable and probably the cheapest mode of transport especially with regard to financial costs. Trekking distances of about 110km were charged an average of Ksh 337 per head of cattle, translating to about Ksh 3 per km per head.

The major losses of livestock during transportation and in the holding grounds arose mainly from three factors: insecurity, lack of feed and water and diseases. Other minor factors were wildlife and natural disasters.

3.3 Informal and Formal Trade

The border with the highest volumes of informal trade for the project commodities was the Uganda-Kenya border especially in the case of maize, beans, rice and bananas. In value terms, Uganda informally exported US\$ 25 million worth of maize to Kenya during the year 2011; the figures for beans and bananas were, respectively, US\$ 9.5 million and US\$ 615,440. Kenya's major informal export to Uganda was rice valued at US\$ 1.4 million during the same period. The other large transactions were noted for informal trade exports from Uganda to Rwanda for Irish potatoes (US\$ 468,600), maize (US\$ 429,600) and bananas (US\$ 303,750); exports of bananas from Uganda to South Sudan (US\$ 3.0 million) and, about US\$ 4.7 million worth of bananas from DRC to Uganda. Literally all cross-border live livestock movements were not recorded largely due to the high porosity of the borders and are hence treated as informal trade.

Maize had the highest value of formal trade accounting for 46 percent (US\$ 97,989,972) of the total value of all the traded commodities along the corridors. This was followed by pulses (beans) which accounted for 30 percent (US\$ 63,647,994), 22 percent for rice (US\$ 46,679,325) and fruits and vegetables (pineapples, Irish potatoes and bananas) accounting for 3 percent (US\$ 5,470,110). Pineapple had the least value of US\$ 1,114,008.

Overall, the Uganda and Kenya borders were the most active accounting for about 51 percent of total trade of the study commodities in the selected corridors. This was followed closely by the Uganda/Rwanda border which accounted for 28 percent of cross-border trade. The least active border was between Burundi and Rwanda (1 percent) while Burundi and Sudan had very little or no exports to Tanzania and Uganda, respectively.

In all the corridors, informal trade had higher traded volumes than formal trade. This was especially the case along the DRC-Uganda border which recorded 100 percent informal trade for all the commodities, regardless of the direction of flow (whether from Uganda or DRC). Data from the Uganda-South Sudan border showed that trade in vegetables and fruits, which flowed from Uganda to

South Sudan, was 100 percent informal. Similarly, key commodities flowing from Uganda to Kenya (i.e. maize, bananas, and pineapples) were mainly traded informally, recording 57 percent, 77 percent, 99 percent of informal to total trade, respectively.

3.4 Non-tariff Barriers (NTBs) to Trade

The report highlights the following typical NTBs that continue to persist in the Nile Basin despite efforts of the regional economic corporations (RECs) aimed at fast-tracking customs unions and free movement of goods and services: i) physical barriers (poor road and storage infrastructure, poor market infrastructure, poor customs infrastructure especially along the South Sudan border points, lack of telecommunication services); ii) cumbersome administrative procedures; iii) non-tariff fees and taxes; iv) insecurity and movement restrictions; and, v) lack of harmonization of sanitary and phytosanitary requirements and other food safety and quality standards. The report provides estimates of the cost implications for these NTBs for different commodities and the borders where they are most prevalent. The NTBs together with other constraints relating to weak institutional capacity, corruption and recurrent civil strife constitute a major hindrance to formal cross-border trade in the region. Other consequences of these constraints are poor producer motivation resulting from limited market access and remuneration; low agri-business competitiveness due to unreliable supply of locally sourced raw materials; high transaction costs; and poor integration between deficit and surplus markets within the region that lead to inability to effectively manage price volatility.

3.5 Conclusion and Recommendations

The Nile Basin has abundant land and water resources making agriculture a priority area in strategies aiming at poverty reduction. Although the NEPAD/CAADP has in the last ten years brought agriculture back in the political and development agenda and while many countries are now allocating more resources to the sector, it is only in Egypt where crop productivity is edging closer to their genetic frontiers. Yields of major food grains (maize, rice and wheat) in the rest of the Nile Basin are hardly one quarter of those in Egypt. Low crop productivity is creating major strains in market supply, value addition and agri-business development. The report recommends that:

- a) Governments direct more resources towards achieving higher crop productivity by increasing use of fertilizer and high yielding seed varieties and by expanding irrigated crop area. Possible approaches such as subsidies and market-based incentive structures are briefly discussed
- b) Livestock productivity in pastoral areas, which are the predominant source of meat supply in the region, can be increased through sustained support to provision of water for example in the form of earth dams along the trade corridors; infrastructure development (roads, electricity, telecommunication and markets); disease surveillance and control; and, developing the capacity of different value chain actors (producers, brokers/middlemen, processors, transporters, drovers, etc) to adequately participate in live livestock trade
- c) Promoting competitiveness and access to agricultural markets by smallholders: promoting market access by using innovative ICT-based approaches, providing financial resources, adding value and seeking new markets (within the region and abroad) and taking advantage of the agro-climatic diversity and abundant natural resources in the region

3.6 Potential Investments

The report elaborates on two different categories of potential investments to address the constraints to cross-border trade in the Nile Basin. The first category comprises investments that the Nile Basin Initiative (NBI) Secretariat could prioritize for immediate implementation following pre-feasibility

studies, namely: i) Improving Lake Victoria water transport and landing sites; ii) Strategic earth dams along the live livestock trade corridors (but serving both agriculture and pastoral needs); iii) Storage facilities for grains, fruits and vegetables located strategically along the borders; iv) Regional agricultural trade training centre (administered by the East African Grain Council - EAGC); and, v) Wet agro-processing for grains, fruits and livestock.

The second category of investments requires NBI Secretariat to initiate debate on their harmonization and, where pilot projects are already underway, a discussion of how they could be scaled up to benefit more stakeholders in the region: i) Regional seed multiplication centres for banana, passion and Irish potato; ii) Good agricultural practices (for fruits and vegetables); iii) Grains e-market; iv) Maize Standards 2013. The last three investments could be offered as stand-alone initiatives but they could also be coupled to others in the first category (as a package). Other investments under this second category include efforts aimed at promoting commercialization of livestock production and access to foreign markets (especially in the Middle East); growing urban consumers and hitherto unexploited region markets. In this context, the report highlights four potential investments: 1) Strategic livestock and livestock products (LLPs) processing hubs strategically located in viable catchment areas; 2) Promoting commodity-based trade; 3) Creating compartments (this works well for smaller stocks); 4) Comprehensive animal branding and vaccination program in the Nile Basin as a first step towards achieving a disease-free zone (for livestock).

Finally, the report outlines a strategy for strengthening the capacity of regional commodity groups, notably, EAGC and Horticultural Council for Africa (HCA). The capacity of the commodity groups was built mainly through the following efforts: a) participation in the design of field work and data collection methods and instruments; b) participation in field data collection and analysis as well as in the workshops for experts, stakeholders and RATP/Steering Committee Members; c) sharing of research documents and data; d) joint preparation of potential investments in the region; and, e) participation in the preparation of dissemination and policy advocacy materials. The Commodity groups will also have access to the value chain approach and cross-border trade monitoring instrument developed by the MA and REMPAL team of experts.

1.0 Introduction

The last decade brought some sense of optimism for Sub-Sahara Africa (SSA) as the region slowly emerged from a prolonged period of economic stagnation and declining per capita incomes. Since 2003, the number of armed conflicts in the region decreased from 15 to just about four hot spots¹ although ethnic and border related skirmishes that have the potential of slowing down economic growth creep up from time to time (Binswanger-Mkhize et al, 2011). There is progress in macroeconomic management with the improved business environment making it possible to foster more enduring public/private sector partnerships (World Bank and IFC, 2011). Similarly, in much of SSA, there have been significant advances in democracy, strengthening of the civil society, freedom of the press and adherence to principles of human rights and equality. To some extent, this growth is explained by improved infrastructure, expansion of the manufacturing sector, vibrant telecommunication network (symbolized by increased mobile phone and internet use) and rapid increase in foreign investments, notably from China, India, Brazil and Turkey (Economist Magazine, December 2011). While agricultural growth performance in SSA has mostly been achieved through expansion of land area and to some extent driven by stronger commodity prices, there is a definite upturn and a break from past gloom. In the last decade, the region witnessed GDP growth above 5.5 percent with agricultural growth rates following closely above 3.5 percent (World Bank, 2009).

However, the gains made by SSA remain fragile and conditions for sustained and multi-year economic growth are not yet in place. The stark challenges still facing SSA are exemplified by the fact that the proportion of ultra-poor (those living on less than half a dollar a day) in the region is still the largest in the world. At the root of these statistics is poverty and food insecurity: more than 260 million in SSA still live on less than \$1 per day, and the poverty reduction rate still falls far below what is expressed in the first Millennium Development Goal (MDG1). According to recent estimates, only three African countries are likely to halve the total number of undernourished people by 2015, namely, Ghana (that reached this target in 2011), Mauritania and Egypt (Omilola et al, 2010). Over a dozen countries are likely to achieve one of the MDG1 elements – halving poverty or hunger by 2015. Similarly, the region as a whole has been faring rather poorly with respect to the three pillars of food security (namely, availability, access and utilization).

The poverty and food security challenges facing SSA are closely mirrored in the Nile Basin region that comprises nine member countries: the Democratic Republic of Congo (DRC), Rwanda, Burundi, Uganda, Tanzania, Kenya, Ethiopia, South Sudan, Sudan and Egypt) all of which, except Tanzania, are members of the Common Market for Eastern and Southern Africa (COMESA). Concerns about wide spread poverty and food insecurity feature prominently in the national development goals of member countries. In 2006, over 10 million people faced the risk of starvation in Ethiopia while in Kenya, Uganda and Southern Sudan, over 6 million people are perennially in need of food aid principally because of weather related impacts and frequent displacement of populations as a result of civil strife (COMESA, 2008).

The Nile Basin has a combined population of about 380 million inhabitants and, in sheer numerical terms, offers considerable potential for consumer demand and intra-regional trade. However, this potential is yet to be unlocked due to widespread poverty and other development constraints. Among the Nile Basin countries, poverty rates ranged from a high of 84 percent in the DRC in 2002 to 38 percent in Uganda in 2003 (COMESA, 2008). Due to past policy neglect of agriculture where the majority derives their livelihood, poverty incidence, and hence under-nourishment, is higher in the rural areas compared to urban areas.

¹ Casamance (Senegal), Somalia, Northern Uganda and Kivu (DRC)

² For the period 1999 – 2002, Egypt was using 448 kg/ha; South Africa (56 kg/ha), Kenya (32 kg/ha) and the consumption in

Sustained economic growth has the potential for reducing poverty and food insecurity but socio-economic inequalities make it difficult even for countries with high per capita incomes to translate such national prosperity into overall poverty reduction and food security. Over 60 percent of the region's poor households derive their livelihood primarily from agriculture. For these households, increased agricultural productivity and trade offer the best means of raising income, ensuring adequate food consumption, and accumulating the assets necessary to survive periodic shocks such as droughts and floods. As household incomes increase due to increased productivity, policy strategies should then shift away from food security to achieving income security through enterprise diversification, value addition and increased participation in markets.

The next two sub-sections highlight the key challenges to economic development in the Nile Basin and the policy initiatives aimed at addressing them while the third sub-section provides an overview of the current status of production and trade in selected agricultural commodities in the region.

1.1 Structural Constraints to Economic Development in the Nile Basin

Low Economic Growth Rates and Inequality

Table 1.1 shows that the economies in the Nile Basin region generally performed poorly in 2009 following the food crisis of 2006/08 and the down-turn in the global financial markets that affected commodity demand. The estimates of GDP growth rates for 2007/10 show that most of the countries in the region have been unable to grow sustainably at rates that are high enough to achieve significant impacts on poverty. The risk of over-relying on a few export commodities that are susceptible to swings in global markets is clearly demonstrated in a number of Nile Basin countries reaching extremes in Burundi where 90percent of foreign exchange earnings are derived from coffee and tea. The region also has examples of the co-existence of healthy economic growth (and high per capita incomes) and inequality manifested in the form of high proportions of the population leaving below the poverty line, for example in Burundi, Rwanda and Tanzania. High income inequalities frustrate human capacity development efforts and ultimately lead to economic instability.

Table 1.1: Economy Highlights of Nile Basin Countries

Country	Real GDP growth rate (percent)				Population below poverty line in 2011 percent	Per capita income in 2011 US\$
	2008	2009	2010	2011		
1. Burundi	4.5	3.5	3.9	4.2	68.0	400
2. DRC	6.2	2.8	3.0	6.5	84.0*	300
3. Egypt	7.2	4.6	5.3	1.2	20.0	6500
4. Ethiopia	11.6	8.7	7.0	7.5	38.7	1100
5. Kenya	1.7	2.6	5.0	4.4	45.9	1700
6. Rwanda	11.2	4.5	6.0	7.0	60.0	1300
7. Sudan	6.6	4.2	5.2	-0.2	40.0	3000
8. Tanzania	7.4	6.0	6.4	6.1	87.9	1500
9. Uganda	8.7	7.2	5.8	6.4	64.5*	1300

Source: CIA Factbook (accessed 3rd July 2012); * COMESA, 2008

Low investments in agricultural development

The role of governments in providing key public goods such as rural infrastructure (energy, transport, irrigation and water and sanitation), research and extension, support to commodity value chains, value

addition and building capacity of regulatory institutions in order to promote agricultural development is well recognized. However, in reality, the sector suffered from a long stretch of historical neglect and many countries in the Nile Basin are still playing a catching up game. Given important challenges such as rapid population growth, climate change, water scarcity, and the volatility of food prices, policy makers are now increasingly recognizing that investment in agriculture is essential for increasing the welfare of rural households.

The public sector is also playing a leading role in support to agricultural research and development (R&D). As would be expected, agricultural R&D is characterized by marked dependence on public support that accounts for over 75 percent of the total agricultural R&D capacity (Beintema and Stads, 2011). While there has been growth in public expenditure in R&D in a few countries such as Kenya, Sudan, Tanzania and Uganda, public expenditure on R&D has either stagnated or has been too low to make any sizable difference in rural development and poverty reduction (Ariga, 2011). Where change was evident, most expenditure was on rehabilitating neglected infrastructure and augmenting low salaries in public research institutions. Some level of investment in R&D in some countries comes from non-profit institutions that are often linked to producer organizations for example covering coffee, sugar and cotton but overall, contribution of non-profit organizations account for under 4 percent of total public agricultural research capacity. In 2000, Africa invested \$0.70 for every \$100 of agricultural output; lower than the 1981 level of \$0.95. In the Nile Basin the intensity ratios ranged from 0.2 percent or lower in Sudan to about 1.3 percent in Kenya which in 2008 invested US\$404 million on agricultural R&D (Beintema and Stads, 2011).

Poor Infrastructure

The rudimentary state of the Nile Basin's rural infrastructure constitutes the single most limiting factor to cross-border trade and economic development. Underdevelopment of infrastructure (power, transport, storage, irrigation and telecommunication) partly accounts for the high transactions costs of doing business in the region. The density of paved roads per one million inhabitants is lowest in DRC where it stands at a mere 59 kilometres but other countries such as Tanzania, Sudan, Rwanda and Burundi do not post significantly higher figures (von Braun et al. 2008). The main trade (transit) corridors in the eastern seaboard of the region that currently originate from the ports of Djibouti, Mombasa and Dar-es-Salaam constitute a economic life line to the land locked Nile Basin member countries. There are two broad policy concerns along these transit routes: a) strategies to increase investments to improve the physical infrastructure which in some cases have deteriorated because of neglect or due to destruction during past civil conflicts; and, b) policies aiming at the 'soft' aspects, namely, regulatory institutions, policy harmonization to minimize costly competition (for example between rail and road), regulations addressing issues to do with insurance, axle load requirements and compliance with sanitary and phytosanitary (SPS) requirements. Infrastructure also has significant implications to agricultural production costs since the region's agricultural inputs (mainly oil, fertilizer and machinery) are largely sourced externally.

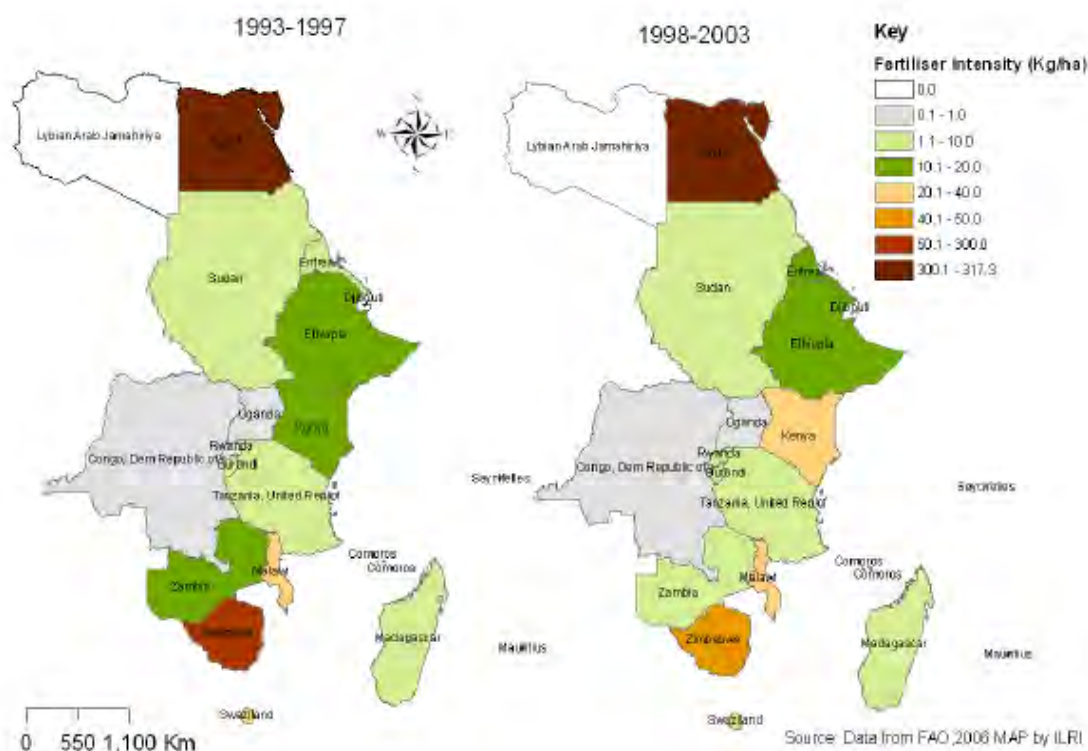
Low Input Use

The Nile Basin's economic potential for fertilizer (largely determined by the prevailing fertilizer responses and prices) is always much larger than actual use. With the exception of Egypt (over 300 kg/ha) and Kenya (20 – 40 kg/ha), all the other countries in COMESA apply no more than 20 kg of fertilizer per hectare (Map 1.1)². The map also shows that between 1997 and 2003, fertilizer application rates in literally all the COMESA countries either declined or remained stagnant. Table 1.2 shows that Eastern Africa, comprising the majority of the Nile Basin countries, performs poorly in terms of yields for main food crops and beef compared to the averages for Africa as a whole. More

² For the period 1999 – 2002, Egypt was using 448 kg/ha; South Africa (56 kg/ha), Kenya (32 kg/ha) and the consumption in Uganda was estimated at just about 1 kg/ha FAOSTAT as reported by KIPPRA's Kenya Economic Report (2008).

specifically, maize productivity in literally all Nile Basin countries stagnated in the last two decades (Table 1.3) reflecting low use of high yielding seed varieties and fertilizer.

Fertilizer use correlates closely with area under irrigation and here again, COMESA countries (except Egypt) significantly lag behind their counterparts in Asia: out of a potential irrigable area of about 600 million ha in the COMESA region, only 2 percent is under irrigation (WBCSD and IUCN, July 2008)³. About 75 percent of crop production in all COMESA countries, except Egypt and Sudan, rely on rainfall. As the variability of rainfall patterns increase due to climate change, the risks of using chemical fertilizers in degraded tropical soils will increase thus putting into jeopardy any efforts aimed at increasing crop productivity unless efforts are made to increase the crop area under irrigation.



Map 1.1: Fertilizer use Intensity in COMESA

Source: Adapted from ILRI (2008) - Fertilizer Use Map (Stella Massawe)

The low usage of fertilizer in the region is explained inter alia by the following factors:

- Fertilizer costs are higher mostly due to additional transport costs related to under-developed physical infrastructure and the fact that most of the requirements are imported
- The region has a much lower proportion of irrigated land despite the abundant water resources
- Most farmers rely more on traditional crop varieties that are less responsive to fertilizers

Although the answer to the dilemma of low fertilizer consumption may lie in exploiting the region's available irrigation potential, there are inherent socio-economic and environmental challenges (such as prohibitive investment costs for large scale irrigation projects, lack of technical know-how among smallholder farmers, low value-cost ratios for the irrigated crops, competing uses for available water and land resources, and undesirable environmental impacts) that cannot be wished away. In the meantime, however, low crop and livestock productivity will continue to impact adversely on competitiveness of the region's agri-business firms.

³ WBCSD and IUCN (2008). World Business Council for Sustainable Development (WBCSD) and IUCN (<http://knowledge.cta.int/en/content/view/full/7739>)

Table 1.2: Agricultural Commodity Yields (2003) tons/ha (except beef)

Commodity	Eastern Africa	Africa	Global
Maize	1.39	1.16	4.47
Wheat	1.28	2.03	2.66
Rice	1.12	1.87	3.84
Beans	0.60	0.62	0.70
Bananas	4.69	6.56	15.25
Beef (kg/animal)	127.00	148.00	200.00

Source: FAO (2004)

It is not just the agricultural primary producers in the region that face challenges, processors too have their share of constraints. Except for Egyptian firms, the majority of agribusinesses in the region face high costs of utilities, poor infrastructure (both transport and storage) and inadequate supply of raw materials forcing them to operate at high excess capacities. In Kenya, for example, several grain millers employ old technology and the modern ones have excess capacities in the region of 50 – 60 percent and hence high average costs of production (Ackello-Ogutu, 2005). Generally, value addition along the commodity chain is limited and the range of traded products is usually narrow and undifferentiated across the region. Although some of these challenges originate from primary productivity at farm levels (due to low input use and hence low marketable surpluses), market and policy factors also have their impacts.

Table 1.3: Maize Productivity by Country/Region (1995 – 2007) tons/ha

Country/Region	1995 – 1997	1998 - 2000	2001 – 2003	2004 – 2006	2007-2009	Approx. annual growth rate (percent)
Egypt	6.7	7.5	7.5	8.1	8.1	2.1
Sudan	0.6	0.7	0.8	1.0	1.9	10.6
DR Congo	0.8	0.9	0.8	0.8	0.8	0.2
Ethiopia	1.6	1.7	1.7	2.1	2.1	4.7
Kenya	1.6	1.5	1.6	1.8	1.5	(1.7)
Uganda	1.4	1.7	1.8	1.5	1.5	(0.2)
Rwanda	1.1	0.8	0.8	0.8	0.8	(1.8)
Burundi	1.3	1.1	1.1	1.1	1.0	(1.6)
Tanzania	1.7	1.9	2.2	1.2	1.2	(6.2)
COMESA	1.8	1.9	1.9	2.0	-	-
Northern Africa	4.7	5.4	5.6	6.1	6.3	3.8
USA	7.7	8.5	8.6	9.6	9.8	2.9

Source: Computed from FAOSTAT; (.) denotes negative growth

Policy related challenges

One of the most dramatic economic policy changes in the Nile Basin in the last two decades or so has been the transition from economies dominated by governments to market driven economic configurations. Most of the governments in the region have adopted policies that aim at reorienting their economies towards market regimes with varying degrees of commitment and outcome ranging from partial and intermittent liberalization to more comprehensive economic reforms. These policy reforms have brought some progress in economic growth in many countries but in some cases, agriculture suffered as governments withdrew from provision of basic services such as extension, credit and marketing. Similarly, the private sector players are yet to benefit from the full potential of

markets under the regional economic corporations simply because the markets themselves underperform due to the absence of the foundations for market institutions. Under such circumstances, the task of agricultural development and trade requires policies that initially promote the development of economic coordination mechanisms that are outside the ambit of markets: because markets themselves are still rudimentary (Doward and Kydd, 2003).

Although tariffs have been drastically reduced under the COMESA Free Trade Agreement (FTA) and the East African Community and the EAC customs union (EAC/CU) to the extent of posing minimal impediments to agricultural trade, a number of commodities are exempted from zero-rating and are thus subject to protection under various safeguard measures. The administration of the safeguard measures (for example to protect the sugar industry in Kenya) is usually ad hoc thus creating unnecessary risks and uncertainties for the private sector, apart from their potential to encourage rent seeking behaviour among public officials. Protectionist trade policies also cause price/efficiency distortions in the regional markets as well as avoidable inequalities in the domestic markets. The rationale of protecting domestic producers (whether for employment or strategic reasons) is hardly justifiable, especially if the underlying structural and policy related causes of inefficiency are not being seriously addressed as is usually the case. Fortunately for the region, safeguard measures with high tariffs or other official import controls apply only to a limited number of commodities (e.g. maize, beans, sugar, milk and cream in the case of Kenya).

Non-tariff barriers to cross-border trade

Non-Tariff Barriers (NTBs) represent a diverse collection of protectionist devices whose only common denominator is their amenability to use by governments in much more subtle and elusive ways than tariffs to influence trade, trade patterns, or free movement of goods and services between nations. Non-tariff policy strategies are dynamic in nature and their application by government agencies is usually quite pervasive. The UNCTAD often uses the term “trade control measures” (rather than non-tariff barriers) comprising: deliberate policies by governments or companies to control imports or exports such as control of information on import/export opportunities, rejection of Certificates of Origin or qualification of goods on non-technical grounds; deliberate delays in effecting payments; and introduction of procedural conditions on traders. The unscientific determination of the value of imports for customs duty purposes that disregards the sales and the deliberate misclassification of goods into tariff codes with higher duties are some of the persistent NTBs.

Health and safety regulations required for the hygienic production and packaging of imported products and labelling requirements showing origin and contents have in the past been treated differently under the Technical Barriers to Trade (TBT) category. Such formal regulations serve legitimate purposes but some are often thinly veiled disguises for restricting imports. The WTO treats all non-tariff barriers to trade (except SPS regulations) as TBTs. Barriers associated with SPS regulations are not so pronounced in agricultural trade in the Nile Basin region but their administration often creates costly bureaucracies that hamper official trade.

Informal technical barriers are defined broadly to include behaviour that is not explicit official policy but which is either practised by officials with the intent of restricting trade, or is a restrictive practice against other market participants that is knowingly permitted to exist despite government’s capacity to stop it. Although such practices exist, they are quite difficult to document and assign to a particular country as they invariably entail collusion between public officials and the traders; the typical examples being bribery, “go-slow” tactics by officials, selective application of regulations to discriminate against certain traders and harassment of foreigners on grounds of flouting immigration rules. As agricultural commodity trade within the region continues to enjoy the success of progressive reduction in tariffs, the struggle to increase formal exchanges must shift to a different frontier, that of dealing with such informal NTBs. The informal trade channels used by traders attempting to avoid NTB-related

bureaucracy pose serious threats to the fight against the spread of plant pests and diseases in the region.

Poor coordination of response to emerging issues and emergencies

The 2006-08 food crisis was a real test of how African countries respond to externally instigated shocks. Globally, food prices had been on a downward trend for several decades, thanks to agricultural bio-technologies, mechanization and farm subsidies initially in the OECD countries, and later because of adoption of Green Revolution technologies especially in the populous countries of East Asia. This declining price regime did not augur well for Africa as it was argued that low prices did not provide incentives for expanding agricultural output and achieving food security. When prices suddenly edged up, it was assumed farmers would take advantage, and to some extent for SSA as a whole they did and agricultural productivity in 2008 -2009 grew faster than population. But while rising food prices offered incentives to producers, they also caused havoc to consumers - through welfare losses - and to producers who are net food buyers. The impact of this on countries depended on factors such as price transmission from the borders, industry composition of GDP (role of the affected commodities in the economy versus receipts from export goods), and safety nets or social protection measures taken by some governments (Abbott and Battisti, 2009). Most of the Nile Basin countries, by virtue of being net food importers, reduced import taxes during the food crisis in order to cushion consumers (using taxes, social safety nets and market stabilization) while a few (Ethiopia and Tanzania) applied export restrictions (ASARECA, 2008 and FAO-GIEWS, 2008).

Vulnerability to climate change impacts

Although global climate change models have increased greatly in number and quality over recent decades thereby improving the scientific understanding of past, present and future climate changes, there remains much uncertainty about magnitudes and impacts of climate changes at any particular location and how best to prepare for these. How people in any given area are affected by climate change will not only depend on the climate changes themselves in that area but also on ecological, social and economic factors (Mendelsohn et al., 2006). Climate changes are hence a prime example of what has been called “socio-ecological systems” with factors from different domains interacting on different spatial and temporal scales (Holling, 2001).

The available literature indicates that changes in precipitation patterns due to climate change will result not only in short term crop failure but will also negatively affect production of most key food crops in the long run in terms of both reduced yields and increased pest proliferation. Apart from direct effects that climate change has on crop yields due to changes in precipitation patterns, climate change indirectly affects crop yields by increasing the water stress on irrigated crops (Nelson et al, 2009). Estimates based on IFPRI’s international model for policy analysis of agricultural commodities and trade (IMPACT) show that both rain-fed and irrigated harvested areas in SSA will decrease by 0.6 percent and 3.5 percent, respectively. Although rain-fed production is predicted to increase by a nominal 0.7 percent, irrigated production will decrease by a sharp 15.3 percent (due to reduced irrigation in some African basins and the fact that some of the irrigated crops such as wheat are very sensitive to heat stress). Overall, total crop harvested area and production are predicted to decline by 0.7 percent and 1.6 percent, respectively (Calzadilla et al, 2009).

In the Nile Basin, the pastoral livestock production systems, and hence pastoralist communities, are generally viewed to be the most vulnerable to climate change impacts (particularly in the large swathes of Kenya, Ethiopia, Sudan and Tanzania). However, other medium and high potential agricultural areas are likely to suffer and thus require pre-emptive policy strategies, especially targeting environmental conservation and use of appropriate technologies and agriculture and livestock husbandry methods. Due to the close links the Nile Basin economies have, vulnerabilities in one part

of the region is easily transmitted to another implying that policy responses to climate change impacts and mitigation will be best addressed through regional collaboration and by investments that cut across the borders.

1.2 Ongoing Efforts to Address the Structural Constraints

Policy reforms and increased attention to agricultural development

All countries in the Nile Basin are in the process of implementing NEPAD's Comprehensive African Agricultural Development Program (CAADP) as a blueprint for increasing investments to the agriculture sector. One of the key goals of CAADP is to improve food security, enhance nutrition, and increase rural incomes by increasing allocations to agriculture to 10 percent of national budgets in order to raise agricultural productivity to at least six percent per year. However, CAADP implementation has been rather slow and many countries in the Nile Basin still face difficulties of poor data availability and quality, lack of ownership, and re-aligning of national policies to conform to its goals (Ackello-Ogutu et al, 2009; Morton, 2010). In 2008, only about 36 percent of all African countries were spending at least 10 percent of their total budget allocations on agriculture (Fan et al, 2009). Despite the challenges, CAADP signaled a major paradigm shift in African Union (AU) member nations' political support and realignment of their national policies and agendas away from budgetary neglect of agriculture.

The program identifies the following four complementary pillars that are critical to the achievement of a minimum of six percent annual growth in agriculture thereby enabling income growth and wealth creation sufficient to cut poverty in half by 2015:

- *Pillar 1:* Extending the area under sustainable land management and reliable water control systems;
- *Pillar 2:* Improving rural infrastructure and trade-related capacities for market access;
- *Pillar 3:* Increasing food supply, reducing hunger, and improving responses to food emergency crises; and
- *Pillar 4:* Improving agriculture research, technology dissemination and adoption.

The AU requested that COMESA takes the lead in developing and coordinating a Pillar 3 strategy that will ensure sufficient food supplies, eradicate chronic hunger and ensure adequate emergency responses in the COMESA region. As Africa's largest regional economic community (REC) and one with large clusters of highly vulnerable groups, the COMESA region has both the requisite expertise and the compelling motivation to address critical food security concerns (COMESA, 2008). Agricultural development in the Nile Basin must therefore be addressed in the context of the COMESA-wide investment strategy in the CAADP framework to which many countries are already aligning their medium term plans (e.g. Kenya's Vision 2030 MTP, Uganda's Plan for Modernization of Agriculture and Rwanda Vision 2020).

Following the awareness created by CAADP, other complementary efforts have emerged that are likely to strengthen the contribution of agricultural science, technology and innovation to the region's agricultural development and intraregional trade. One of these efforts is the 2006 Framework for African Agricultural Productivity (FAAP), which provides a roadmap to improving agricultural productivity by enabling and accelerating innovation. Importantly, FAAP is motivating bilateral and multilateral donors to take a more coordinated approach to funding agricultural development programs and responding to stakeholder priorities thus harmonizing activities at the country, program and project levels. FAAP responds to CAADP Pillar IV by providing a strategy for revitalizing, expanding and reforming agricultural R&D capacity and shifting towards more focus on integrated innovation systems that actively engage public, private and civil society stakeholders (FARA, 2006). CAADP's Pillar III

Framework for African Food Security supports governments' design of agricultural programs to ensure broad-based pro-poor growth and improvement in food security.

Efforts to address poverty and food insecurity

At the national levels, poverty is being addressed broadly through poverty reduction strategies (espoused in poverty reduction strategy papers) that have been largely donor driven and forming the overarching policy strategy. Implementation remains patchy and is often disrupted by emergencies (e.g. the recent food crisis and global financial meltdown) and capacity and coordination constraints. In some of the countries (e.g. Kenya, Uganda, Rwanda and Tanzania), problems of rural poverty and food insecurity are being addressed through implementation of input subsidy programs aiming at increasing agricultural productivity and household incomes as well as by short term programs such as *Njaa Marufuku* Kenya, school feeding, food for work, vitamin fortification, etc). In the medium and long term, strategies will have to place more emphasis on exploiting the region's irrigation potential in order to avoid over-reliance on rain-fed production that tends to increase risks in fertilizer use.

At the regional level, the MDG1 forms the main poverty reduction thrust but indications are that none of the countries in the region is on course to achieving the goal by 2015. The NEPAD/CAADP program, on the other hand, aims at increasing public budgetary allocation to agriculture in order to increase the sector's GDP growth and thus have some meaningful impacts on poverty, assuming sensitivity on issues relating to equity. However, the CAADP agenda is off course (according to a recent external review) even as many countries in the region make efforts to adopt and internalize its investment framework. There are also fears that there will be strong temptations for countries with oil and mineral resources (e.g. DRC, Uganda, South Sudan and Rwanda) to neglect agriculture (so called natural resource curse) thereby exacerbating food insecurity and inequalities in income distribution.

Improving intra-regional trade and infrastructure development

The main thrusts for promoting intraregional trade in the Nile Basin are through the EAC and COMESA that have been steering their member countries through market liberalization and open borders in the context of customs unions. Regional markets offer opportunities for exploiting economies of scale in production and hence specialization and economic efficiency through comparative advantage. In the case of food crops and livestock, market expansion also acts as a means to attaining regional food security by ensuring that scarce resources are optimally allocated in accordance with prevailing regional opportunity costs. In practice, however, the Nile Basin faces numerous challenges that prevent its agricultural markets from functioning optimally, partly due to the inherent nature of agricultural products and partly because of persistent retrogressive trade policies, imperfect markets and the poor state of the region's infrastructure.

In the spirit of the "Cairo Declaration" during the COMESA Agricultural Ministers' Meeting of November 2005, COMESA has been actively pursuing a regional approach to food security by promoting infrastructure development and harmonized policies that will enable free flow of food staples from surplus to deficit areas driven primarily by price incentives and market forces. A number of the region's production and trade challenges such as crop and trans-boundary livestock diseases, limited national research and breeding capacities, knowledge sharing and establishment of databases, early warning and forecasting systems all require a regional approach.

The gradual move towards fully functioning customs unions for EAC and COMESA promises to minimize NTBs relating largely to: SPS standards, vehicle axle load and weight limits, insurance requirements, trade administration, suspended taxes and rules of origin. But, ultimately, the rationale for the so-called 'sensitive list' of commodities often presented for derogation and which slows down the implementation of regional integration protocols must be unearthed. A move towards regional trade

based on product differentiation, for example through value addition, rather than ‘differences’ is likely to spur intraregional trade and avoid unnecessary controversy.

Building Institutional Capacity

Regional integration offers opportunities for the private sector investment. However, experience thus far suggests that progress is being hindered by weaknesses in institutional capacity and lack of clear division of roles (among key stakeholders). There is a demonstrated need for governments to increase budgetary allocations to agricultural research and development (to at least two percent of the national budgets as envisaged in the Maputo Declaration), to help build capacity and to staff public agricultural institutions at thresholds able to tackle emerging and diverse policy issues. Where government allocations have fallen behind resource needs, development partners have intervened but this has implications on priority setting, project relevance and sustainability. Rwanda, Uganda and Sudan are some of the Nile Basin countries where donor support has been quite dominant and concerns have been raised regarding sustainability of the donor supported programs such as input subsidies and support to building of institutional capacity for increased private sector participation in regional trade.

The Nile Basin already hosts private sector initiatives such as the regional commodity groups whose capacity to lobby for trade policy reforms need to be bolstered especially with regard to analytical capacity, dissemination of market information, and enterprise/regional coverage. The private sector will be expected to play a critical role in filling the lacuna created by the withdrawal of the public sector (following the adoption of structural adjustment programs) from the provision of agricultural services relating to extension, veterinary medicines and artificial insemination, input distribution, credit and marketing. In order to provide these services effectively, the private sector institutions need both the enabling environment and private-public partnerships; the latter are already in fledgling stages in countries like Kenya. The main commodity groups in the Nile Basin are the East African Grain Council (EAGC) and Horticultural Council of Africa (HCA); trans-boundary livestock issues (mainly diseases/animal health) in the region are currently handled by AU-IBAR.

The Nile Basin Initiative

The Nile Basin Initiative (NBI) began with dialogue among the riparian states that resulted in the shared vision which was formally launched in February 1999 by the water ministers of nine countries that share the river: Egypt, Sudan, Ethiopia, Uganda, Kenya, Tanzania, Burundi, Rwanda, the DRC as well as Eritrea⁴. The NBI is a partnership that seeks to develop the river in a cooperative manner, share substantial socioeconomic benefits, and promote regional peace and security. The Nile, a shared water source for about 160 million people living along the watershed boundaries, supports agricultural, industrial and domestic users. Its waters are also used for hydro-power generation as well as for sustaining the region’s eco-system with agriculture being one of the largest users. These demands on the Nile are expected to increase with growing economies and populations. Due to the high dependence on agriculture in the region, more pressure will be exerted on the Nile thus necessitating efficient water demand management and water use planning. These demands exerted on a very important but finite resource have reinforced the need for the NBI shared vision to achieve sustainable socio-economic development through equitable utilization of, and benefit from, the common Nile basin water resources.

To achieve its objectives of poverty alleviation, sustainable economic growth, reversal of environmental degradation and controlling the cost of extreme water events such as flooding and drought, the Nile basin initiative through its implementation agency, Nile Equatorial Lakes Subsidiary Action Program (NELSAP), initiated the Regional Agricultural Trade and Productivity project (RATP) in 2006. Countries participating in the RATP are Burundi, DRC, Egypt, Kenya, Rwanda, Sudan,

⁴ Eritrea, which shares only a very small portion of the Nile Basin, is not an active participant in the Initiative

Tanzania, Uganda and Ethiopia. The RATP objectives are aligned with the Pillars 1 and 2 of the Comprehensive Africa Agricultural Development Program (CAADP) combining sustainable water management with the promotion of trade and agribusiness linkages. The project supports generation of agricultural knowledge that is basin-wide, in line with the aims of the NBI's Institutional Strengthening Project (ISP) and NELSAP's Subsidiary Action Program.

Prior to planning trans-boundary projects for the promotion of cross-border agricultural trade, NELSAP undertook a pilot assessment of the selected cross-border trade corridors, which are important for the regional food security and trade through RATP. Therefore, this regional trade and productivity consultancy will undertake analysis of issues as a follow-up of the pilot assessment done in the project Inception Phase.

1.3 Significance and Growth of Agriculture in the Nile Basin

The role of agriculture in the region's poverty reduction and food security strategies cannot be gainsaid yet the sector has steadily been losing its global competitiveness and hence access to lucrative export markets. Countries in Africa as a whole have fared poorly in capturing expanding global markets and although the continent contributes about 12 percent of the world population and five percent of agricultural GDP, its share of global agricultural exports has declined from eight percent in the 1960s to just two percent in 2009 (Byerlee, 2011). Much of this decline occurred during the pre-structural adjustment period, but it has continued to fall since 2000 at a time when global exports were steadily rising. While there have been success stories of countries (e.g. Cote d'Ivoire, Ethiopia, Kenya, Ghana, Uganda, Mozambique and Zambia) that increased their agricultural export market share since 1991, 15 out of 24 countries with a population of over 10 million in Africa lost their share. Conversely, food import shares have been trending upwards thus changing SSA in particular from being a net agricultural exporter in the 1970s to a significant net agricultural importer in the 2000s.

The instability of global markets seems to have provoked serious questions regarding the ability of markets as a basis for resource allocation, and in particular distribution of food products and requisite inputs from surplus to deficit regions. In the Nile Basin, where poor transport and communication infrastructure is a major contributor to production and distribution costs, instability in the global food prices can have particularly dire consequences on the welfare of land locked countries, populations in remote rural villages and for net food importing countries. Although countries in the region are actively pursuing export oriented policy strategies, market liberalization and regional integration under the auspices of EAC and COMESA, the food crises of 2006/08 and 2010/01 seem to have awakened a sense of urgency about national food self-sufficiency and renewed commitment to agriculture.

Agriculture is of strategic importance in the economic development of the Nile Basin. With the exception of Tanzania, all countries in the region are members of COMESA whose main goal is achievement of an integrated market with free movement of goods and services. Among the countries in the Nile Basin, it is only in Egypt where agriculture contributes less than 20 percent of the GDP highlighting the importance of agriculture for the development of the region. About 40 percent of COMESA's trade portfolio is based on agriculture compared to about 45 percent that is accounted for by manufacturing. Agriculture has great potential in the fight against poverty and achievement of regional food security. This notwithstanding, the sector has expanded in most COMESA member states at a lower rate than their economies and populations. During the past three decades, COMESA's agricultural production rose by an average of only 1.9 percent per annum in the face of an annual population growth rate of about three percent per annum, with the GDP growth rate standing at barely 1.4 percent. Among the challenges that hamper the growth of agriculture and agribusiness are issues relating to low productivity, inappropriate policy framework and factors that continue to restrict market access within the region and in foreign markets.

Agricultural growth in most of the Nile Basin countries is highly erratic due to high dependence on rain-fed production (Table 1.4). Due to poor planning and price transformation, weak market structures and limited value addition, abundant production during the good seasons does not always translate to increased producer income. With high post-harvest losses, surpluses are often lost while at the same time lack of storage creates gluts that exert a downward pressure on prices thereby reducing private sector confidence in agricultural markets and commercialization.

Table 1.4: Agricultural growth and contribution to GDP in the Nile Basin (1998 – 2009)

Country	Average annual growth rate Agriculture sector				Agriculture sector as percent of GDP					
	1988- 1998	1998- 2008	2007	2008	1988	1998	2007	2008	2009	2010
Burundi	-1.4	-1.9	...	...	54.2	46.3	...	...	31.8	31.6
DR Congo	2.5	0.0	3.0	3.0	29.8	47.5	42.5	40.2	55.0	...
Egypt	2.9	3.4	3.7	3.3	19.0	17.1	14.1	13.2	13.5	13.5
Ethiopia	3.1	5.8	9.4	7.5	53.9	25.6	46.3	44.5	38.7	42.9
Kenya	1.1	2.8	2.1	-5.0	29.9	31.2	25.0	27.0	19.7	22
Rwanda	-0.8	4.5	0.7	15.0	39.2	45.5	35.6	37.4	42.1	42.1
Sudan	6.1	2.1	3.1	4.0	41.5	46.3	28.3	25.8	32.1	32.1
Tanzania	3.2	4.7	...	...	...	44.8	...	...	41.6	41.6
Uganda	3.7	2.4	-0.3	9.1	56.7	42.1	24.0	22.7	23.6	22.5

Modified from: World Bank Countries at a glance 2010 data;... denotes missing data

1.4 Food Price Changes and Implications in the Nile Basin

Global food prices have been both erratic and generally inflationary and the impacts on the Nile Basin region, which is a net importer of key staples, have profound development implications. For example, the prices of major foodstuffs increased by an average of about 55 percent between March 2007 and March 2008 and there are indications that the upward pressure on regional food prices is likely to persist through 2015 (ASARECA, 2008). For every 10 percent increase in the prices of all cereals (including rice) nearly US\$ 4.5 billion is added to the aggregate cereals import bill of developing countries that are net importers of cereals (OECD, 2008). Although favourable weather patterns led to production increases in the major producing countries, mainly, Ethiopia, Kenya and Uganda, demand still outstripped supply thus necessitating imports, especially for maize, wheat and rice. The simultaneous co-existence of pockets of deficits and surpluses in the region and governments' preference of policies that restrict official trade tend to encourage informal cross-border trade (ICBT). Prices of major foodstuffs increased by an average of about 55 percent between March 2007 and March 2008 and there are indications that the upward pressure on regional food prices is likely to persist through 2015 (ASARECA, 2008).

Food prices are major drivers of inflation while price volatility leads to household income risks and uncertainties. The impact of food prices is highly significant on household consumption and nutrition particularly in the arid and rural areas of low income regions of the Basin where food accounts for a large share of the family budgets. Unlike the food crises of mid-1970s and the one in 2007-08, the ramifications of the most recent spike that commenced after mid-2010 are yet to be fully understood. A recent study by Hossain and Green (2011) reveals a more varied impact compared to the price spike of 2006/08: the informal urban sector, small-scale farmers and small traders have generally been more negatively affected compared to commodity producers and workers in export sectors; and, high food prices forced consumers to shift to cheaper and less preferred, and often poorer quality foods.

In the longer run, upward trends in food prices could provide major additional opportunities for Nile Basin farmers, especially in terms of access to domestic and regional markets that will also grow because of rising incomes. The farmers would also have a major opportunity to re-conquer other global markets lost over the past decades. Internationally, the changing food demand and supply patterns will lead to more South/South trade, which in the long run will bolster the opportunities arising from domestic and regional markets.

2.0 Aims and Objectives of the Project

This project was designed to assess and analyze the trade flows for specific commodities along selected corridors in the Nile Basin. It also aimed at highlighting the opportunities and constraints to trade and their determinants such as types of infrastructure, commodity attributes (e.g. structure and distribution of production and consumption), market structure and policy/regulatory actions prevailing at country and regional levels. The information gathered and results emanating from their analysis will facilitate identification and profiling of potential investments to improve intra-regional trade and economic development. The main analytical approaches applied entail the following thrusts: mapping out the production structure; value chain analysis, estimating trade volumes and values; identification of main chain participants and institutions, including gender/youth roles; highlighting main resource use and market access challenges; and, identifying investment opportunities.

2.1 Objectives of the Project

Achieving food security and poverty reduction, while conserving the environment and scarce natural resources, are unequivocally the common policy goals in the Nile Basin region. One of the critical assumptions in the design and articulation of the objectives of this project is that increased agricultural productivity, especially among the smallholder producers, can lead to wealth creation that ultimately impacts positively on food security and poverty. In the introductory section, we have highlighted the following factors deemed to impinge negatively on this critical link between aggregate economic growth (measured, for example, by GDP) and food security and poverty reduction:

- Inequalities in income distribution lead to unsustainable economic growth
- Low investments in agriculture hinders innovation, value addition and global competitiveness
- Low input use among smallholder farmers, including under-use of irrigation potential, has implications not just on productivity and income but also on regional effective demand for manufactured and value added products
- Poor physical infrastructure and coordination of related regulatory institutions increases transaction costs
- Private sector players are unable to take advantage of regional market opportunities because of: i) policy challenges at national and regional levels; and, ii) non-tariff trade barriers
- Poor coordination of responses to external impacts, for example, those arising from global markets, climate change and natural disasters lead to costly duplication of efforts and in the long run distort regional markets

The above constraints essentially constitute the underlying 'problem' and, hence, the rationale for the study. The broad objective of the consultancy is therefore to undertake regional agricultural trade analysis in order to provide policy strategies for addressing the constraints with a view to improving the region's productivity and marketable surpluses as well as identifying potential investments that will improve efficiency in water management. The latter will work in synergy with policies that reduce intra-regional trade obstacles and thus create an environment where food security and poverty reduction can be sustained.

The specific objectives of the study were to:

- (i) Examine the functioning of selected agricultural markets
- (ii) Evaluate the potential for cross-border trade
- (iii) Identify constraints to trade across selected corridors and determine their relative importance
- (iv) Estimate the level and nature of marketing costs at national and cross-border levels
- (v) Prepare recommendations for investments and policy actions to reduce identified, and to the extent possible costs and constraints to trade

2.2 Scope of Services Provided and Limitations

2.2.1 Commodity Clusters

In line with RATP, the study focused on products that are critical for food security and income generation. The products were categorized into three major groups of tradable clusters: (a) grains and pulses (maize, rice and beans); (b) fruits and vegetables (passion fruit, pineapple, banana, and Irish potatoes); and (c) live livestock (cattle, sheep, goats and camels). The crop selection was based on suitability for water use intensification (irrigation), management of the structural deficits and involvement of large numbers of smallholder producers, opportunities for value addition and access to lucrative foreign markets. It is important to point out that cross-border trade in agricultural inputs and other commonly traded consumer goods was not the subject of the consultancy.

The Nile Basin contains large regions that are classified as arid and semi-arid and in which livestock production under pastoralism currently constitutes the predominant source of livelihood. These pastoral livestock production systems have immense opportunities and market potential because of rising global consumer demand for animal resources. But, they also face daunting challenges relating to declining water resources access over which invariably lead to communal conflict. Despite the rapid growth in consumption of dairy products and other value added livestock products such as hides and skins, these commodities did not fall within the scope of the analysis.

2.2.2 Main Tasks (Summary)

The tasks were broadly delineated as follows:

- **Task 1** - Describing national and regional markets, and defining and characterizing the “Trade Corridors”
- **Task 2** - Developing the methodology and estimating the spatial and seasonal marketing costs of activities along the chain, from producers to consumers along the corridors (infrastructure/storage, capital costs and organization/management) – Task 2 entailed two components comprising: a) Estimates of Marketing Costs; and, b) Developing a value map showing the distribution of various functions, actors and their transactional inter-relationships, and overlays including cost-build up through the value chains and the time frame
- **Task 3** – Preparing recommendations giving conclusions on the key constraints, problems and investment opportunities and the roles to be played by different stakeholders in the medium and long terms
- **Task 4** - Strengthening the capacity of the regional commodity groups

2.2.3 Activities within Tasks

The specific activities falling under each of the above tasks are expounded below:

Task 1: National and regional markets

- i) Describing production trends for the selected commodities
- ii) Delineation of structure and distribution of production and consumption in the region
- iii) Characterization of the ‘trade corridors’ and estimation of formal and informal cross-border trade (ICBT) flows along the corridors:
 - a) Identification and characterization of the trade corridors
 - b) Estimation of ICBT volumes and values; direction of trade flows; and seasonality in trade;
 - c) Assessment of implications of ICBT to employment and food security;
 - d) Identification of constraints faced by traders;
 - e) Evaluation of gender and youth dimensions of informal trade along the corridor
 - f) Estimation of formal trade along selected corridors
 - g) Estimation of total cross-border trade and projected trade flows

- h) Assessment of implications of formal and informal CBT to efficient water use
- iv) Description of major value chains and main players:
 - a) Description of how the markets function in-season compared to off-season and in good compared to bad harvest/production times for the selected commodity trade corridors
 - b) Description of trade methods used by small and large importers/exporters
 - c) Description of gender and youth mainstreaming elements that exist along the value chains
- v) Assessment of trade and investment opportunities and challenges along selected corridors:
 - a) Identification of national and cross-border trade opportunities for communities along the corridors in the trade and supply of the selected commodities
 - b) Documentation of main barriers (tariff, non-tariff and physical barriers) to cross-border movement of the selected commodities
 - c) Highlighting of trade and investment policies in existence that have impacts on trade along the commodity corridors
 - d) Preparation of trans-boundary maps showing production and consumption areas, direction and magnitude of trade flows and seasonality of flows for the trade corridors
 - e) Description of the roles to be played by different agencies (e.g. governments, commodity groups, RECs) and policy reforms needed to expand investments and intraregional trade for the selected commodities.

Task 2 Part I: Estimates of Marketing Costs

STORAGE ACTIVITIES

a) Storage infrastructure and post-harvest losses

- i) Describing the typical post-harvest/post-production storage infrastructure at different value chain stages
- ii) Estimating post-harvest storage-related losses as percent of farm level production and the value (US\$ per ton or US\$ per animal)
- iii) Main factors contributing to storage losses for different storage structures along the G/P and F/V corridors

b) Capital Costs

- i) Describe the operating costs of different types of storage infrastructure (depreciation/life of godowns)
- ii) Identify cost-effective and small-scale post-harvest/post-production storage facilities at various stages of the supply chain in each of the commodity corridors

c) Organization - management – ownership of storage infrastructure

d) Comparative analysis to assess whether the above costs (in parts a, b and c) differ for formal as opposed to informal commodity trade channels and to bring out similarities and contrasts

TRANSPORT INFRASTRUCTURE COSTS

- a) Describe the prevalent modes of transport for different commodities at different stages along the corridors
- b) Estimate transport charges to traders (in US\$ per ton-km or US\$ per animal-km) for different modes, commodities and market destinations
- c) Give disaggregated operating costs for transport owners/operators: fixed (staff, depreciation, finance) and variable costs (fuel, tires, maintenance, weighing bridges, bribes) for each mode and at each stage of transportation. This may also include waiting time spent (wasted) because of checks at roadblocks.
- d) Identify the major determinants of transport prices/and costs at each stage: all possible causes should be clearly delineated: market structure (with possible market power e.g. existence of

monopolies, oligopolies, monopsonies, etc), cash scarcity, quality of roads, transport infrastructure, transport services availability and affordability, low production in remote or mountainous areas, etc

- e) Compare the above costs (parts a, b, c and d) for formal as opposed to informal commodity trade channels

COSTS OF DOMESTIC NTBS

a) Catalogue the existing non-tariff trade barriers (NTBs) and their cost implications along different borders: local taxes; fees and regulatory measures; roadblocks; expenses at weighing bridges; bribes to public officials; losses due to pilferage in storage or transit; costs arising from poor road conditions; costs of poor policy harmonisation across the borders.

- b) Compare the above costs for formal as opposed to informal commodity trade channels

OTHER TRANSACTION COSTS

a) Estimate and distinguish between regulations and other expenses in the formal and those in the informal trade in the commodity corridors.

b) Estimate the costs of commercial transaction arrangements in terms of reservations, agreements, durable relationships, etc in the commodity corridors

c) Establish the terms and conditions and the payment methods used by formal and informal traders in the commodity corridors (cost implications?)

Task 2 Part II

Develop a value map showing the distribution of various functions, actors and their transactional inter-relationships, and overlays including cost-build up through the value chains, and the time factor in the flow.

Task 3: Recommendations

a) Conclusions on constraints/problems and opportunities by considering:

- i) The traded commodity in each of the corridors
- ii) The 'link' of the value/ to the commodity chain
- iii) The sectors of private, public (which administration, institutional), and the CBOs.
- iv) The level of trade such as: local, national, regional, and Nile basin
- v) The time horizon for example: immediate, short, medium term and probably long-term for strategic planning

b) Draw conclusions with recommendations on identified potential investments in trans-boundary roads, customs facilities and equipment, storage facilities and other infrastructure investments in the corridors

c) Make recommendations on identified priorities for public sector at national and regional levels to remove unnecessary obstacles to trade and to crowd in private sector investments, while distinguish between: (i) short and longer-term policy recommendations; and (ii) actions to be undertaken at three levels: (a) regional, (b) national, and (c) district/local production/consumption cluster levels

d) Propose corresponding solutions/mitigation measures on identified priority interventions linked to the recommendations in part (a)

e) Recommend the role for NBI vis-à-vis other regional (EAC, COMESA, EAGC, HCA, etc) and national stakeholders in promoting and preparing investments for regional agricultural trade related to commodity clusters

Task 4: Strengthening capacity of the regional commodity groups



- a) Indicating the role and responsibilities of the regional commodity groups in the proposal/action plan
- b) Involving the regional commodity groups in the study process
- c) Training the regional commodity groups on the methodology of the study
- d) Document issues/practices that could be used by the regional commodity groups for advocacy in the improvement of cross-border trade in the corridors
- e) Encourage strengthening of commodity groups during project activity-related workshops: enhanced organization; capacity building for improved administration/secretariats' actions and advocacy programs

3.0 Methodological Approaches

3.1 Basic Principles Guiding the Approach

The economics of regional agricultural markets is not different from that of domestic markets except that the former, by virtue of being under the aegis of a 'foreign' sovereign government, entails added risks and uncertainties to decision makers (producers and marketing agents) and consumers in a trading partner. All the same, regional markets offer opportunities for exploiting economies of scale in production and hence specialization through comparative advantage. In the case of food crops and livestock, market expansion, theoretically, acts as a mechanism for achieving regional food security by ensuring that scarce resources are optimally allocated in accordance with prevailing opportunity costs. In practice, however, there are numerous challenges that prevent regional agricultural markets from functioning optimally, partly due to the inherent nature of agricultural products and partly because of trade policies and market structure. Price formation under imperfect markets, or where markets have failed, tends to be the order of the day implying that resources used in production are hardly allocated to their most deserving users and hence raising issues to do with efficiency and equity.

Regional trade is premised on 'gains' to both exporter and importer but this often masks the reality that trade invariably creates short term losers who may require a helping hand from government. It is these fears of short term 'static' losses from trade that often influence trade policies such as tariffs and non-tariff barriers whose aim is usually to protect potential domestic losers, comprising largely import competing producers and consumers as well as tax revenue collectors. Whether such protection is good or bad becomes a normative issue but the work of regional integration arrangements such as EAC and COMESA is to ensure that borders remain open and that regional partners reap maximum benefits from trade.

Factors likely to influence the functioning of regional agricultural markets are: structure (number of players and entry and exit conditions), availability of marketable surpluses, access to capital and market information, technology, infrastructure, seasonality, consumer demand and random events. Most of the global trading is no longer guided just by the Ricardian theory and differences in resource endowments that lead to inter-industry trade. Through value addition and product differentiation, it is now possible for countries to trade even if their product mix is identical as is usually the case in agriculture. Trading 'likes' for likes' is the way of the future but it requires innovation and appropriate facilitation from the public sector and development partners. Government policies aimed at improving infrastructure, communication, access to capital and information can raise the potential for trade while poor policies (e.g. inward looking strategies), bad governance and insecurity will inhibit trade.

As we endeavoured to identify constraints to increased cross-border trade and investment opportunities, we were cognizant of the diversity of the region and the multiplicity of roles stakeholders play in the market place with varying consequences on costs and returns. For example, in its efforts to protect urban consumers, government can end up distorting investment opportunities for smallholder farmers, making it unprofitable, for instance, to use irrigation. In some cases, the private sector is crowded out by a government that is apprehensive of the impacts of open borders that would be the avenue for supply of raw materials. Similarly, institutional failure often leads to poor administration of customs and legal requirements at border crossing points thus leading to most trade passing through informal channels. But in other cases, factors beyond the control of regional decision makers are at play: these may include global market factors and emergencies caused by uncontrollable natural phenomena or human conflict. All these different scenarios have different impacts and welfare implications. The value chain approach adopted in this study aimed at capturing the different roles played by stakeholders and identifying areas where policy interventions are likely to have maximum impacts on regional food security and poverty reduction.

3.2 Methodological Approaches for Different Tasks and Activities

3.2.1 Approaches for collecting secondary data

Secondary data was collected mainly from UNCOMTRADE, FAOSTAT, EAGC, HCA, livestock marketing organizations, FAO and government ministries in order to determine the *trends and structure of production and consumption* of the selected commodities. The trade channels linking the main production and consumption regions were traced taking into account seasonality and the main factors influencing production and productivity. The secondary data was supplemented with

The construction of the *transboundary maps* showing production and consumption areas, direction and magnitude of trade flows, and seasonality of flows relied heavily on the secondary data and on key informant interviews and focus group discussions with value chain players at various levels. The transboundary maps were based on administrative boundaries for the nine Nile Basin countries and application of the ArcGIS10 platform (ESRI 2011). All the maps required the GIS data highlighted in Table 3.5.

Table 3.5: GIS Datasets gathered for mapping

Types of datasets	Source	Details
Base maps		
Infrastructure	Survey of Kenya, World Resources Institute (WRI)	Highway/street centreline, databases at national levels
Elevation	National and international mapping organizations (NIMOs)	DEMs at regional levels
Hydrology	NIMOs	Water bodies at national and regional levels
Socio-economic		
Administrative boundaries	NIMOs	Obtained from maps at different scales
Human population census	National governments/ international bodies who make projections of these data up to a common year	Data collected typically every 10 years with annual estimates and projected to a common year e.g. 2010

3.2.2 Characterization of trade corridors and estimation of formal and informal trade

a) Identification and characterization of the trade corridors

The trade corridors were profiled on the basis of the following parameters: i) major agro-ecological zones within the corridor; ii) commodities produced, traded and the direction of trade flow; iii) seasonality of production and trade; and, iv) major trade constraints and opportunities. The corridors correspond to the commodity clusters or value chains.

The cluster for **Grains and Pulses** had two corridors, namely, the North-East Corridor starting from the Shinyanga Region in Northern Tanzania and covering 3 main borders (Northern Tanzania/Kenya, Kenya/Uganda, and Uganda/South Sudan); and the Western Corridor that began in the surplus maize and beans producing region of Kigoma in Western Tanzania and covering the Tanzania/Burundi, Tanzania/DRC and Burundi/DRC borders.

Fruits and Vegetables focused on passion fruit, pineapple, banana and Irish potatoes and the corridor stretched from Burundi, through Rwanda to Uganda and finally to Kenya.

In the **Live Livestock cluster**, where the major livestock species involved were live cattle, sheep, goats and camels, two corridors were surveyed:

Corridor 1: This corridor started from the Taita Taveta ranches and Mombasa in the Coast Province of Kenya, through Garissa, Nairobi, Isiolo and Moyale town on the Kenya-Ethiopia border. From there, the corridor joined the southern Ethiopia livestock catchment area around Wabeir, Teltele, Arero, El Leh and Mega towns.

Corridor 2: Starting from western Ethiopia/eastern Sudan border, the corridor included Khartoum, Wadi Halfa on the Sudan/Egypt border and ended in Cairo, Egypt.

b) Estimating Informal Cross-border Trade (ICBT)

An alternative to border monitoring using observations at designated border posts would theoretically be through the use of secondary data from the Departments of Commerce and Industry. Official records at the national offices usually provide accurate values and volumes of imports (inclusive of informal components) while the export data tend to underestimate informal trade. Ideally, exports of one country should equal recorded imports of the trading partner in terms of value since one finances imports with proceeds of exports. The discrepancy between imports and export figures of two trading partners can be used as an estimate of unrecorded/informal trade. However, there are a number of exceptions and possible errors that make this approach unreliable. This leaves actual border monitoring as the only, albeit tedious, way of quantifying ICBT (technical details can be gleaned from the 1996 *ICBT Methodology* document by Ackello-Ogutu, and its various adaptations by RATES, COMESA, EAC, FEWSNET, EAGC and ReSAKSS).

An important consideration in border observations for informal trade flows is the proper definition of informal cross-border trade (ICBT), traded commodities and identification of the roles played by different actors. The term Informal Cross-Border Trade (ICBT) is applied mainly to *un-recorded* trade of easily observable goods passing *through* and in the *neighbourhood* of the established customs points. This definition includes goods that are under-invoiced or mis-declared without necessarily including clandestine operations involving sophisticated secret deals that are difficult and risky to track. For budgetary and sampling reasons, transactions along the open border, outside the established roads and trading centres are not included in the sampling frame. It is assumed that such transactions are usually in the form of a rather balanced and insignificant barter trade.

Definitions of the informal sector usually adopt two approaches: the labour market approach and the sectoral approach. The former emphasizes the individuals involved in the activities and the latter stresses the activities (source). We have not made any particular distinction in terms of the two approaches here. There is instead more emphasis on the activities undertaken in the sector (particularly the type, quantity and value of the traded goods) and the profile of the individuals involved in such activities.

The main ICBT players comprised: informal trade participants; traders; hawkers/agents; transporters; consumers; and public officials. The border sites were selected on the basis of popularity, volume and regularity of trade. Procedures for determining the observation time frame were based on Ackello-Ogutu (1996). Monitoring of informal trade lasted for 60 days at each site in order to account for seasonality, active market days and prevailing trader practices at the selected sites and their neighbouring supply and consumption markets that are located at distances influenced by the traded commodities (e.g. in terms of perishability or surplus/deficit status). The monitoring period was representative enough to allow extrapolation of trade flows to one year and comparison with data collected by other agencies such as EAGC, FEWSNET, RATIN and UBOS.

c) Estimating formal trade along selected corridors

Both formal and informal trade corridors are a function of physical infrastructure (such as roads, storage and social amenities such as hotels and shopping centres), security, cultural practices and traditions and the target demand locations (for example, urban population and distance to border points). A combination of these factors determines the trade volumes and commodity diversity in a corridor. This in turn influenced the sampling of the points to monitor along national borders: the general rule is that cross-border markets function only through or in the neighbourhood of supporting infrastructure and institutions. The commodity markets are characterized in terms of their structure, conduct, price formation and roles played by other trade agencies such as EAC, COMESA, AU, IGAD, ASARECA and private sector organizations such as the EAGC.

The data collected for this activity included volume and values of traded commodities and information on source and country of import for each commodity. The data sources for this activity were: UNCOMTRADE, FAOSTAT, customs records in Nile Basin countries, records from Ministries of Trade and Industry, case study reports, RATIN, UBOS, FEWSNET and other internet sources. Since national trade and investment policies (and hence, trade volumes between trading partners) are rarely corridor specific, trade transactions on the ground along the trade corridors could grossly under-estimate actual trade flows between countries. The formal trade data has therefore been interrogated through discussions with traders, informed market players and governments and regional market integration bodies such as EAC and COMESA. The directions in trade flows are further checked against production figures and supply considerations derived from trend lines and incidences of droughts that affect production and supply in different countries.

d) Estimates of total cross-border trade and projected trade flows

Data on the total cross-border trade for each commodity (sum of volumes and values) are presented on an annual basis and assessment made of their implications to efficient water management in the Nile Basin. Trade flow projections were made using annual growth rates of both forms of trade.

3.2.3 Describing major value chains and main players

A “value chain” consists of the set of activities undertaken in the management of the flow of goods and services along the value-added channel of agricultural and/or food products, in order to realize superior customer value at the lowest possible cost (Genova et al., 2006). In other words, it consists of the “full range of activities which are required to bring a product or service from conception, through different phases of production (involving a combination of physical transformation and input of various producer services), delivery to final consumers, and final disposal after use” (Kaplinsky and Morris, 2000). Efficiency of a value chain requires that the activities of producers are actively integrated with those of other actors such as input suppliers, transporters and processors and that the volume of products produced is a function of the consumer needs.

A value chain analysis for a particular agricultural product involves a systematic assessment and examination of all the activities involved in marketing, including, among others: research and development; production and supply of raw materials; and, transport and delivery activities. The analysis should also delineate where value could be added, agribusiness needs and how upgrading particular activities could enhance profitability and incomes. In this study, data collection on the value chains entailed interviewing all actors, from producers (Photo 3.1) to consumers.



Photo 3.1: A focus group discussion among the producers

The cereals, fruits and vegetables, and livestock value chains were divided into four stages: Production, Marketing, Processing, and Distribution (Figure 3.1). Each of these stages has actors that directly handle the product from the 'farm to fork'. Other indirect actors that contribute to the flow of products through the value chain include government, research, extension and financial institutions. Farmers producing cereals, fresh fruits and vegetables are usually of different categories based on scale of production. They use own and hired resources such as land and labor as well as purchasing capital/modern inputs such as seeds, chemicals and irrigation equipment.

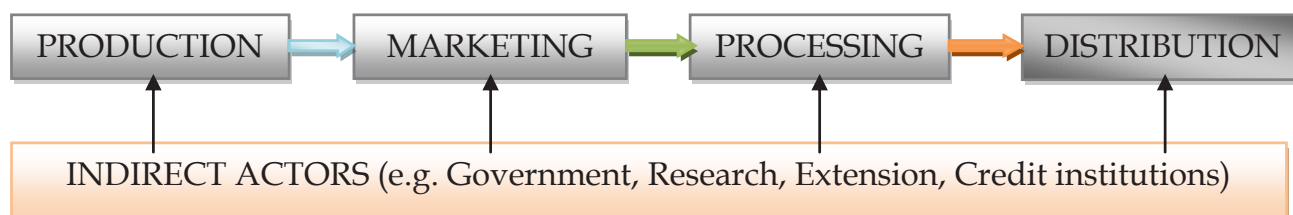


Figure 3.1: The Analytical Framework for the Grains/Pulses and Fruits/Vegetables

Source: Adapted from Kaplinsky and Morris (2000)

Processors of cereals include millers and food service industries that produce value-added products such as flour and cereal-based foods. In contrast, fruits and vegetables are processed into dried fruits, fruit juice, fruit jams, canned fruits, chips, flour by food service industries. Both of these processors sell value-added products through various channels including wholesale and retail traders, supermarkets, and institutions. By-products are sold mainly to livestock producers to be used as animal feed. Indirect actors that play a critical role in the functioning of these value chains include government and its related institutions. In addition to providing farmers with key inputs such as new seeds and extension services, government and its related institutions also establishes, monitors, and enforces rules, regulations, and policies regarding quality standards. Credit institutions also provide some of the much needed capital to farmers, traders and processors in these value chains.

Unlike the case in Figure 3.1, the live livestock value chain comprises fewer stages due to the fact that the analysis does not involve livestock products. The value chain thus entails mainly production and marketing, with the animals ending up directly at the abattoirs (processors), or being channelled first through fattening (in feedlots or commercial ranches) before processing/export; the immature animals on the other hand could go directly to another region for breeding purposes.

Farmers keep livestock under both traditional and modern systems that differ in cost regimes and the marketing is done through various channels: auction markets, traders, butchers (rural and urban) and slaughterhouses. To enhance the performance of this value chain, government and its related institutions establishes, monitors, and enforces rules, regulations, and policies regarding health, quality standards and movement. Together with other indirect actors, the government is also responsible for the provision of productivity enhancing inputs.

For each type of value chain, questions relating to the following aspects were explored:

- Where the most value is added to the value chain
- The most important actors within the value chain
- The institutional framework
- Main bottlenecks
- Market potential for growth and upgrading
- The size of the sector/chain
- Where possible synergies exist

The specific data collected included:

- Commodity traded and gender of the trader
- Size of exporter/importer - e.g., small as opposed to large
- Questions on the interaction between sellers/buyers on both sides of the border
- Nature of contractual arrangements [if any] in place
- Constraints to trade e.g., effects of customs, police roadblocks, sanitary requirements and the strategies the exporters/importers use to circumvent/deal with them
- Whether gender has any influence on how the constraints are dealt with

3.2.4 Methods for estimating different cost categories

This task aimed at developing a methodology for estimating the structure and nature of marketing costs faced by various value chain players. It was intended that the methodology so developed be adopted for future use in other value chains by country governments, private sector, CBOs, and regional commodity groups, among others. The spatial and seasonal costs include, but are not limited to, infrastructure such as roads and storage, non-tariff barriers, and other expenses such as value-addition.

The estimation of costs applied a methodology based on the framework of transaction cost economics. Accordingly, costs for each value actor were classified either as direct costs or transaction costs. The transaction costs were associated with storage, transport as well as those due to domestic NTB and by definition, covered: 1) searching and gathering information on (potential) transaction partners and agents, goods or services, technologies, prices; 2) bargaining and negotiating contracts, terms of exchange (or transaction arrangements), executing the exchange process, and adjusting the terms of exchange if necessary; and, 3) monitoring and enforcing the contracts (arrangements, agreements, rules, etc.).

In most cases, the transaction costs are hidden and can only be captured using the opportunity cost of labour (e.g. waiting time at collection points during delivery of commodities). According to the above interpretation, direct costs of transport and purchase costs of goods and services were not considered as 'transaction costs' and were thus catered for in a different cost category.

The direct costs are payments for factors of production (such as land, capital and entrepreneurial skills) required to physically transform inputs into outputs and costs of processing (value addition) and marketing. Both direct costs and transaction costs are divided into investments and recurrent components; the former being incurred during the pre-production phase of farm businesses or processing while the latter arising during the production/processing phase. For transaction costs, the monitoring and enforcement cost components are largely recurrent costs.

The cost estimation distinguished between formal and informal traders in addition to assessing the cost implications of participation by particular actors. The results of the analysis were presented in two formats to capture the costs of different marketing operations/activities as shown below, and in the form of value cost maps.

i) Storage activities

a) Storage infrastructure and post-harvest losses: This component had the following sub-activities: i) describing the typical post-harvest/post-production storage infrastructure at different value chain stages; ii) estimating post-harvest storage-related losses as a percentage of farm level production and the value (US\$ per ton or US\$ per animal); and, iii) identifying the main factors contributing to storage losses for different storage structures along the commodity corridors.

b) Capital Costs: The sub-activities of this component included: i) describing the operating costs of different types of storage infrastructure (depreciation/life of godowns); and, ii) identifying cost-effective and small-scale post-harvest/post-production storage facilities at various stages of the supply chain in each of the commodity corridors. Costs associated with storage infrastructures/facilities included maintenance expenses in preventing destruction, repair due to destruction by animals and other factors, depreciation, information acquiring costs when seeking for information on repairs and maintenance, and any contractual/agreement costs when interacting with repairers. Capital costs were derived from producers, traders and processors (except for live livestock) through questionnaire interviews.

- c) Organizational Costs:** This component estimates costs relating to institutional (exchange interrelationships contractual, etc) arrangements in supply chain management such as procurement of the commodity (for traders or processors) and/or sale of the commodity (for producers), including the management of the storage infrastructure. The costs captured included contract costs (for either procurement or sale), storage costs, human resource costs for the supply chain management, membership costs (e.g. if the producer/trader/processor is a member of a marketing association/group), insurance costs (if the inventory is insured), and the opportunity cost of inventory.
- d) Comparative analysis:** All the costs compiled under the above three categories were tabulated in order to assess their incidence on formal as opposed to informal commodity traders as well as describing similarities and contrasts between formal and informal trade channels.

ii) Costs of transport infrastructure

This segment focused on four aspects: **a)** describing the prevalent modes of transport for different commodities at different stages along the corridors; **b)** Estimating transport charges to traders (in US\$ per ton-km or US\$ per animal-km) for different modes, commodities and market destinations; **c)** presenting disaggregated operating costs for transport owners/operators: fixed (staff, depreciation, finance) and variable costs (fuel, tires, maintenance, weighing bridges, bribes) for each mode and at each stage of transportation. This also included waiting time spent (wasted) because of checks at roadblocks; and, **d)** identifying the major determinants of transport prices/and costs at each stage: all possible causes were clearly delineated: market structure (with possible market power e.g. existence of monopolies, oligopolies, monopsonies, etc), cash scarcity, quality of roads, transport infrastructure, transport services availability and affordability, low production in remote or mountainous areas, etc.

As in the case of storage costs, a comparative analysis was undertaken in order to assess the differences in the incidence of the transport infrastructure costs among formal and informal trade.

iii) Costs of Domestic NTBs

The costs associated with non-tariff trade barriers (NTBs) were estimated and comparisons made to determine their significance along formal and informal trade channels. These costs relate mainly to: local taxes; fees and regulatory measures; roadblocks; expenses at weighing bridges; bribes to public officials; losses due to pilferage in storage or transit; quality depreciation while goods are stored or in transit; costs arising from poor road conditions; costs of poor policy harmonisation across the borders.

iv) Transaction costs of formal and informal trade

Estimation of the transaction costs entailed: a) quantifying and distinguishing between regulations and other expenses in the formal and those in the informal trade in the commodity corridors; b) estimating the costs of commercial transaction arrangements including terms of reservations, agreements and durable relationships in the commodity corridors; and, d) establishing the terms and conditions and the payment methods used by formal and informal traders in the commodity corridors.

3.3 Sampling and Field Data Collection and Analysis

3.3.1 Methods for collecting primary data

Both qualitative and quantitative methods were used to generate primary data. The fieldwork began by use of qualitative methods entailing interviews of various actors along the corridor, understanding the geographical coverage of the chains and collecting data on average marketing costs (to determine their seasonal trends) and other characteristics of the chains. During this time a scoping study was

also carried out in order to determine market centres where quantitative data was to be collected using a semi-structured questionnaire.

a) Qualitative methods

Qualitative methods included focus group discussion with producers, key informant interviews with various chain actors, extended case studies and participant observation. The details of these methods are provided below:

i) Focus Group Discussions (FGDs)

This method was only applied to collect data from producers. The information collected during the focus group discussions was particularly important in assessing the reliability of information gathered from key informants such as government and NGO officials, and secondary sources. For each of the value chains, we propose to conduct one focus group discussion comprising 20 producers at each of the selected surplus producing areas of the commodity corridors. The 20 producers comprised 5 men, 5 women and 10 youths⁵

The researchers liaised with Ministry of Agriculture officials at the local districts and divisions in order to identify one pocket of production where the FGDs was conducted. This pocket had the highest production level of the targeted crop produce/livestock. The twenty (20) farmers of the FDG was selected using systematic random sampling after establishing household population in the selected study pockets. From each of the identified areas, a group of three to five village elders, including at least one local assistant chief assisted the researchers in listing all resident households in a systematic way. A checklist of questions was used to guide the discussion.

ii) Key Informant Interviews

Informal interviews or consultations were held with relevant players participating in the value chains. These players was derived from all direct actors (producers, transporters/shippers, traders, processors, exporters, retailers and consumers) as well as indirect actors (leaders of direct actors' associations and government officials) in the value chains. Direct actors in the value chain was interviewed about their operations, levels of costs and margins, storage of produce, transportation issues, upgrading and governance issues, and technical and policy constraints, transactions and agreements, etc. Leaders of associations were asked about the operation of their associations and opportunities available for and challenges faced by the actors. Government officials were interviewed about the prevalent policies and regulations in the selected sectors and how they affect trade (see details of data to be collected in Section 3.6.2).

iii) Extended case studies

Extended case study analyses were undertaken with individual market actors, opinion leaders and subject matter specialists from the government ministries that are involved in value chain activities in the commodity corridors. Ethnographic interviewing technique was applied in carrying out the case studies. We propose to conduct at least a case study in each chain in order to capture unique contemporary socio-economic phenomena among all the actors in the commodity corridors.

iv) Participant observation

⁵ The United Nations defines 'youth' as persons between the ages of 15 and 24 years. This definition is applied in this study.

This involved direct examination of value chain logistics for verification purposes, for example individual farmer transport, drying and storage facilities, transport infrastructure, factories/plants, and warehouses. By walking around in the villages, markets, etc., and talking to different key informants, some vital information about the actors, practices and beliefs were recorded and presented in the report.

b) Quantitative methods

Quantitative data was generated through personal interviews using a semi-structured questionnaire. This questionnaire targeted randomly selected market actors in identified key markets in towns, cities and peri-urban areas, along the corridors. The questionnaire was carefully pre-tested and revised before administration. Trained enumerators were used to conduct personal interviews with randomly selected market actors.

3.3.2 Sampling Procedures for market actors

The first target for the market actor quantitative survey was the **local markets** in the grain/pulses, fruit/vegetable and livestock producing areas of the corridors. The respondents for these interviews were value chain actors such as **producers, middlemen (traders), processors and millers, transporters and consumers**⁶. It is expected that the number of chain actors (or length of the value chain) depended on the commodity and the operational characteristics of the corridor. Also, some value chains are likely to start and end in some big cities/towns in the corridors such as Kisumu, Kampala, Kigali, Bujumbura, Masaka, etc. instead of continuing up to the end of the entire corridor as specified in the project terms of reference.

Before embarking on interviews using the semi-structured questionnaire, a scoping mission was conducted in order to establish key market centres in both surplus and deficit areas of the different commodities in the corridors. The markets for different commodities were purposively selected according to criteria such as the number of market actors involved in the relevant commodities, use of water from regional rivers and lakes in the Nile Basin, trade activities of actors that are related to study commodities and survey budgetary constraints. To eliminate small and *ad hoc* trading markets from the survey, only formal (licensed) markets which have designated market days were considered. However, the condition of 'having market days' was relaxed for big towns and cities which have large markets that are active on a daily basis.

Having selected the survey markets, the sampling frame for different chain actors in each market was established by conducting a head account which was then be authenticated or validated by key informants, regular traders and licensing officers or 'market askaris' by asking them to confirm the number of suppliers who 'normally' frequent the market. A probability proportional-to-size systematic random sampling was used to select the interviewees out of which a sample of 20% from each category of actors in every market was selected. This implies that markets with many actors for a particular category had a larger representation. Also, small markets with less than five actors for a particular category shall not be considered. Efforts were made to avoid double counting of actors that move from one market to another (mobile actors) though such actors were used as key informants when tracking origin and destination of commodities.

The above sampling and interviewing processes was repeated in all selected markets within the corridors; whether they were **mainly primary producer markets, secondary producer markets or consumer markets**. The corridors (including border points) were monitored for 1-2 months (30-60

⁶ Consumers are not included in the live livestock value chains

days), depending on length and/or target centres, with recall questions being used to capture seasonality of data in the corridors.

3.3.3 Administering field surveys among market actors

The data collection process was structured in such a way that most of the qualitative methods, with the exception of focus group discussions (FGDs), were first employed from the starting point of the corridors to the end. This was followed by a detailed survey of market actors in the corridors, whereby individual direct players were sampled and interviewed in selected markets using a semi-structured questionnaire. The FGDs were also conducted in the surplus producing areas at this stage.

For the **North East corridor for grains and pulses**, major markets for grains and pulses were selected from the following towns: Mwanza, Kisumu, Kitale, Bungoma, Tororo, Jinja, Kampala, Masindi, Gulu and Juba. In addition, the following border towns were included in the survey: Isebania along the Kenya-Tanzania border, Busia and Malaba along the Kenya-Uganda border, and Nimule and Oroba along the Uganda-Sudan border. Considering the volumes of trade and ‘porosity’ of the border, we plan to allocate 2 border monitors at Isebania, 3 at Busia and Malaba (each), and 1 each at Nimule and Oroba. In addition, 6 enumerators were used to collect value chain data among various actors along this corridor. Both border and corridor monitoring activities ran concurrently and for 60 days. The grain and pulses commodity expert was the overall leader of data collection in this corridor and he was assisted by an MA & REMPLI assistant and 3 local field supervisors.

Major markets targeted for the **Western corridor for grains and pulses** included Kigoma, Zomba, Kalemie, Fizi, Uvira and Bujumbura. Here the role of water in the transportation of grains and pulses was also investigated. One border monitor was placed on each of Lake Tanganyika’s ports: Bujumbura, Uvira, Kigoma and Kalemie. Six (6) enumerators were used for monitoring activities along the corridor. As with the North East corridor, the grain and pulses commodity expert was supported by an assistant (from MA/REMPAL) and 3 locally recruited field supervisors.

In the **fruit and vegetable corridor**, large markets that were targeted for collection of both qualitative and quantitative data included Kisii (bananas), Kisumu, Molo/Njoro (potatoes), Bungoma (passion fruits), Kitale (passion fruits), Jinja, Kampala, Masaka (bananas), Mbarara (bananas), Kisenye (pineapple and bananas), Kigali (passion fruits) and Bujumbura. Other markets that were surveyed include Cyanika (for Irish Potatoes that are traded between Kisoro and Rwanda border), Kagitumba (has different fruits and vegetables), Gatuna, Ntungamo and Bushenyi (bananas). Efforts were also made to track cabbage movement from DRC to Uganda through Bunia and Butembo.

A total of 10 border monitors and 6 enumerators, 3 supervisors and one assistant were allocated to this corridor. As this corridor shares the Kenya - Uganda border with the North East corridor, efforts were made to use the same border monitors for the collection of cross-border trade data. Similarly, these two corridors shared enumerators and field supervisors that were used to collect value chain data in Kisumu, Kitale, Kampala and Jinja.

Data collection in the **Kenya-Ethiopia-Eastern Sudan live livestock corridor** targeted Isiolo, Garissa, Wajir, Marsabit, Moyale, Mega and Arero. Border monitoring was conducted in Moyale (Kenya-Ethiopia border), and Akobo and Pochalla (Ethiopia-Sudan border). Each of these towns had one border monitor while a market actor survey was conducted by 4 enumerators. The field team was under the leadership of the livestock commodity expert, one assistant from MA/REMPAL and 2 locally recruited field supervisors.

The **Sudan – Egypt livestock corridor** monitored movement of camels by trucks to Port Sudan on the Red Sea. One border monitor was placed at (or near) Port Sudan. There was no trade of other live

livestock in this corridor as cattle are normally slaughtered and the beef exported to Cairo by air. This corridor involved data collection using the key informant interviews only hence only the livestock commodity expert and one local assistant were involved. The corridor monitoring activities took 30 days.

3.3.4 Data types collected using different methods

Data collection from the market actors was operationalized through different sets of checklists of issues and a detailed semi-structured questionnaire. Cross-cutting issues such as food security, gender and youth dimensions, policies and use of water in the Nile Basin were incorporated into all the instruments. The different types of data collected using these instruments are highlighted below:

Data collected using **focus group discussions (targeting producers only):**

- Main crops grown in this area, trend in production over the last 5 years, which varieties/breeds are kept/grown, whether production is done individually or collectively, gross margins, etc
- How producers obtain inputs for production of the study commodity and the live animals, general trend of prices of inputs,
- Extension, credit, and others services,
- Post-harvest technologies practiced, transport of produce, losses, charges by other actors, % of losses to gross margins, etc.
- Economic importance of the crops and livestock to the household, region,
- Key constraints in their production and marketing of these products, opportunities for enhancing production and trade,
- Labour allocation among adult women, adult men, female youth and male youths, etc.
- Factors inhibiting and/or facilitating participation of men, women, male and female youth for selected agricultural products and corridors
- Women, men, male & female youths
- Perceptions (attitudes) and practices of men, women, male and female youth related to participation and deriving of benefits from trade

Data collected using **key informant interviews with transporters and shipping companies:**

- Ownership of the company, period of existence, its competitors and clients, etc.
- Origin and destination of the products (Uganda, Kenya, Sudan, Rwanda, Burundi, DRC, Ethiopia, Egypt or other African country), etc.
- source of information on the value of products,
- Processes to follow when sending products within and outside the country to other Nile Basin countries,
- Transport /shipping fee structure, current shipping rates, etc.
- Services offered to clients such as packaging, payment transfer, etc.
- Gender and youth dimensions in the transporters and shipping firms
- Use of water in the rivers and lakes in the Nile basin

Data collected using **key informant interviews with leaders of producer/traders/processors associations:**

- Current membership, services (roles), scope, types of crops/ livestock members are involved in, services provided to the members and the advantages of being a member etc.
- Formation of the associations and their evolvement over time, initial objectives, initial number of members, etc
- Sales and marketing data, coordination and negotiation of sales by the association, markets for association's products, location of new markets, etc.
- Product requirements/specifications and quality standards, compliance,

- Perceptions on tariff and non-tariff barriers, costs or risks to members, etc.
- Economic portfolio of the members, whether production is part-time or full time activity for the members, efficiency in production by members, etc
- Trade challenges and opportunities for the associations and their members
- Perceptions on how policies in the trade corridors affect trade
- Gender and youth dimensions in the associations and their members
- Use of water in the rivers and lakes in the Nile basin

Data collected **using key informant interviews with exporters and traders:**

- Quantity of cereals, fruits/ vegetables and number of livestock traded, quality, etc.
- Main clients, initial finding of clients, seasonality of clients and trade
- Type of storage and its capacity, transport issues and costs, other costs, etc.
- Interaction with other traders and trader associations, power wielding among value chain actors, assistance offered by the clients in terms of advances, credit, information inputs, technical assistance, recommendations, etc
- Satisfaction level with trade, challenges experienced, opportunities for increasing trade, policies related to the value chain business economic environment, etc.
- Government's role in the industry, price determination, sourcing of products and communication channels in place, role of other indirect players, etc.
- Risks encountered in the trade, future of trade (time horizon), etc.
- Gender and youth dimensions among traders
- Use of water in the rivers and lakes in the Nile basin

Data collected using **key informant interviews with government officials and other indirect actors**

- Importance of cereals, fruits/ vegetables and livestock sub-sector to the economy, etc.
- Role of the government, other key (indirect) players in this sub-sector, their roles, interests, etc.
- Any expected changes overtime in terms of research, extension, input distribution, production, transportation, processing and marketing, etc.
- Existing rules, policies and legislation related to the sub-sector and channels of communication to the various value chain actors, etc.
- Monitoring and enforcement mechanisms of trade and traders, problems experienced, inter-regional relations, etc.
- General business economic environment, strategic interventions put in place by government to boost cross-border value chain
- Technical skills and other capacities to integrate women and youths in trade
- Use of water from rivers and lakes from the Nile Basin

Data collected **using key informant interviews with retailers:**

- Prices paid by retailers, storage capacity, forms in which produce is bought (processed or unprocessed),
- Ways of buying the supplies, the preferred suppliers and how they are found, etc
- Services retailers provide to their suppliers in terms of inputs, credit and advice on market demand,
- Ways of communicating with the suppliers about the product requirements and also how the prices are determined.
- Customers/ clients of the retailers, their preferences, changes in requirements and preferences of the products, consumer trends which influenced the future direction of these products industry, etc
- Interaction with other traders and trader associations, power wielding among value chain actors

- Gender dimensions among the retailers, including labour allocations
- Use of water in the rivers and lakes that drain to the Nile Basin

Data collected using **key informant interviews with processors:**

- Main products bought, processed and sold, modes of processing,
- Raw products (material) prices, value addition, processing costs, sales prices and technological upgrades
- Traders/ middlemen interactions in obtaining products to process, suppliers preferred, source of the products,
- Services provided to the suppliers, communication with the suppliers, etc.
- Type of storage, transport modes, charges, losses, reasons for losses,
- Market outlets, meeting of clients and challenges faced, opportunities expected, etc.
- Roles of indirect actors such as the government, policies, etc
- Interaction with other actors and conflicts of interests

A summary of categories of data collected using the **semi-structured questionnaire:**

- Socioeconomic and demographic data of men, women, male and female youths involved as market actors, e.g., gender, age, education, etc.
- Key functions of actors and agricultural commodities involved and approximate amounts
- Details of respondents' businesses, including financial aspects, and legal requirements.
- Membership to trader associations/farmer groups, market information and its usefulness, information about commodities traded
- Estimated gross margins
- Post- harvest technologies, transport modes, their costs (charges), advantages, disadvantages and reasons for preference
- Post-harvest losses, magnitude/extent of losses and reasons for losses, possible solutions to curb losses
- Costs of production, storage, transport, market transactions, operating costs, depreciations, maintenance and repair, organizational/managerial costs, costs of institutional arrangements (e.g., contracts), waiting times for transactions, costs (losses) due to breach of contracts, etc.
- Local taxes, fees and regulatory measures, roadblocks, expenses at weighing bridges, bribes to public officials, costs (losses) due to pilferage in storage or transit, costs arising from poor road conditions, costs of poor policy harmonization across the border, etc.
- Costs of commercial transaction arrangements, regulations and their associated costs, reservation and their associated costs, time wastage and other expenses, cost implications from terms and conditions and the payment methods used, etc
- Data on livestock also included the general market characteristics such as number of livestock sold per market, assistance from veterinary officers, etc.
- Labour allocation among adult women, adult men, female youth and male youths, etc.
- Factors inhibiting & facilitating participation of & accruing of benefit to men, women, male and female youth for selected agricultural products and corridors
- Women, men, male & female youth positions in cross border trade for the selected agricultural products & corridors
- Perceptions (attitudes) and practices of men, women, male and female youth related to participation and deriving of benefits from trade for selected agricultural products and corridors
- Interventions needed to address the negative attitudes & practices against men, women, male and female youth related to participation and deriving of benefits from trade for selected agricultural products and corridors
- Use of water in the rivers and lakes in the Nile Basin

3.3.5 Data Entry and Analysis

After the approval of the inception report and data collection instruments by the Client, a data template for the market actor questionnaire was built using SPSS. The template was split according to the sections of the semi-structured questionnaire in order to ease data entry and also minimize errors. Each section was done by one trained data entry clerk in order for him/her to become fully familiar with the section and therefore minimize data entry mistakes.

For the qualitative data (from key informant interviews and focus group discussions), entry was done using qualitative templates prepared by the commodity experts. Data in these templates was later analyzed and used to write the qualitative reports of the different study corridors.

4.0 Production and Consumption Structure and Distribution

4.1 Production Trends for Selected Commodities

Production of the major food crops in the Nile riparian countries stagnated in the last two decades and only in the past five years does one see some degree of consistency in growth. In particular the Eastern Africa region continues to experience deficits in most of the food commodities (Table 4.6). Crop production is predominated by smallholders whose productivity has been severely affected by their over-reliance on rain-fed agriculture (rather than irrigation), increasing costs of off-farm inputs, poor infrastructure and rapid depletion of soil nutrients due to shortening of fallow periods. Although some of the Nile Basin countries, notably Kenya, Uganda, and Ethiopia had exemplary post-independence records in agricultural research and extension services aimed at promoting adoption of high yielding seed varieties and fertilizer (especially in the production of commercial crops such as tea, coffee, tobacco and horticulture), the adoption of these improved technologies by producers of food crops has been singularly disappointing except for Egypt. Food crop yields in Eastern Africa fall below the averages for Africa, except in the case of maize; they also compare quite poorly with global averages. The region's yields for the major cereals (maize, wheat and rice) are only 13, 10 and 20 percent of their potentials, at the research stations, respectively (Ackello-Ogutu, 2008).

Table 4.6: Supply of and demand for selected agricultural commodities in 2003, 2009 and 2015 (000' tons)

Commodity	2003		2009		2015	
	Supply	Demand	Supply	Demand	Supply	Demand
Maize	10,546	10,803	12,508	12,709	14,968	15,032
Rice	2,558	3,069	2,954	3,691	3,424	4,470
Cereal Other	1,690	1,681	1,859	1,862	2,053	2,057
Potatoes	3,137	3,181	3,777	3,885	4,582	4,763
Beans	1,359	1,330	1,471	1,463	1,626	1,725
Vegetables	9,844	8,666	10,915	10,148	12,181	11,952
Bananas	15,335	15,334	17,825	17,824	20,825	20,825
Fruits	3,940	3,789	4,568	4,303	5,334	4,904
Bovine Meat	1,290	1,294	1,538	1,537	1,842	1,842
Mutton Meat	432	425	463	474	500	526
Meat, Other	573	574	611	659	656	764

Source: ASARECA/IFPRI, 2005

MAIZE

Apart from Egypt whose maize production is irrigated, output in the other main Nile Basin producing countries - Ethiopia, Kenya, Uganda and Tanzania – is highly erratic and susceptible to weather patterns. The harvested area in all the Nile Basin countries, except Egypt, has generally been on the rise since 1998 (Table 4.7). Area expansion has been most noticeable in Uganda and somewhat marginal for Kenya, Ethiopia and Tanzania (Table 4.8). The latter three countries allocate the largest areas for maize production (between 1.5 and 3.0 million hectares in the last five years) but their national outputs have stagnated at about 3 million tons for over two decades (Figure 4.2). The smaller of the maize producers in the region (Burundi and Rwanda) also had significant area expansion probably reflecting consumption patterns that favour maize and hence the public policy emphasis on the commodity.

Table 4.7 : Maize production trends (000 mt)

Year	Burundi	DRC	Egypt	Ethiopia	Kenya	Rwanda	Sudan	Uganda	Tanzania
1990	168	1008	4799	--	2290	101	27	602	2445
1991	172	1023	5122	--	2400	104	61	567	2332
1992	176	1053	5069	--	2430	98	51	657	2226
1993	172	1130	5039	1456	2089	87	40	804	2282
1994	123	1184	5112	1396	3060	67	48	850	1486
1995	153	1008	4535	1990	2699	56	21	913	2874
1996	144	1101	5165	3164	2160	67	54	759	2822
1997	145	1167	5806	2987	2214	83	52	740	1831
1998	132	1215	6337	2344	2464	59	42	924	2685
1999	129	1199	6143	2832	2322	55	37	1053	2421
2000	118	1184	6474	2683	2160	63	53	1096	1965
2001	124	1169	6094	3298	2790	81	53	1174	2653
2002	127	1155	6431	2826	2409	92	53	1217	4408
2003	127	1155	6530	2744	2711	79	53	1300	2614
2004	123	1155	6236	2906	2607	88	60	1080	3157
2005	135	1155	7085	3912	2906	97	10	1170	3219
2006	117	1155	6374	4030	3247	92	109	1258	3423
2007	116	1156	6243	3337	2929	102	70	1262	3302
2008	118	1156	7401	3776	2367	167	62	1266	3556
2009	120	1156	7686	3897	2439	286	66	1272	3326
2010	126	1156	7041	4400	3222	432	35	1373	4475

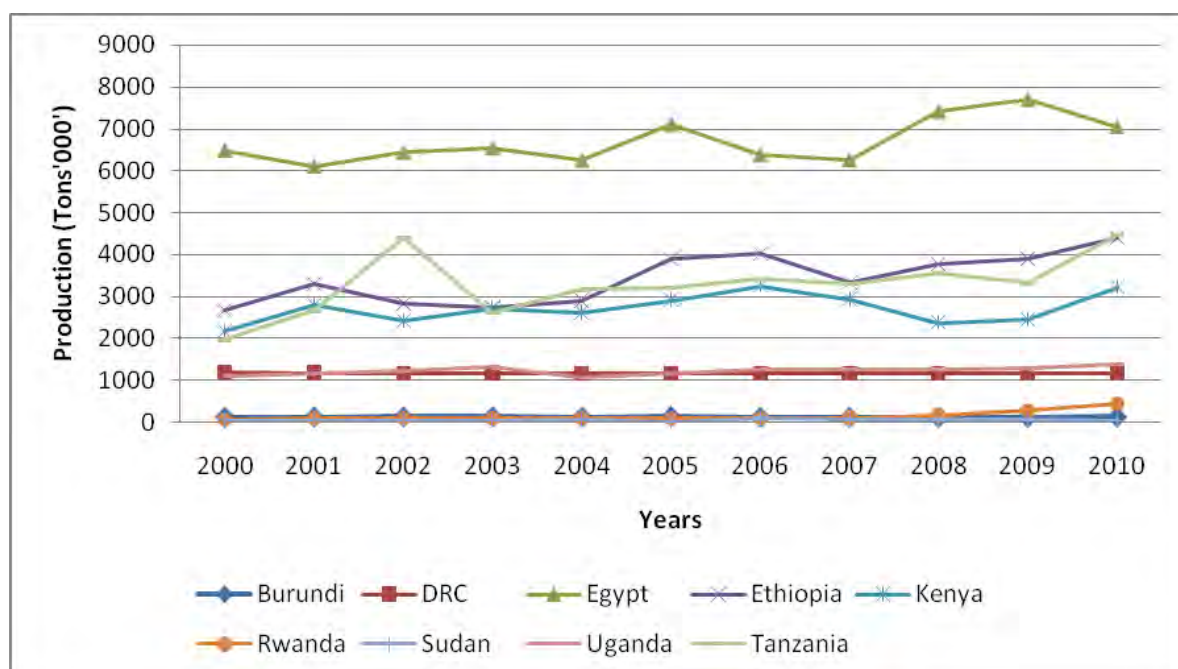
Source: FAOSTAT (2011)

--" means data unavailable

Table 4.8 : Maize harvested area (000 ha)

Country/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Burundi	112	115	116	113	114	116	115	106	117	120	126
DRC	1482	1463	1482	1482	1483	1483	1483	1484	1484	1484	1485
Egypt	843	873	828	834	789	868	762	776	936	983	969
Ethiopia	1656	1893	1507	1791	1802	1950	1526	1695	1767	1768	1772
Kenya	1500	1640	1592	1671	1351	1771	1888	1615	1700	1884	2008
Rwanda	89	106	105	103	115	109	115	141	145	147	185
Sudan	72	72	63	72	58	10	104	37	31	37	26
Uganda	629	652	676	710	750	780	819	844	862	887	890
Tanzania	1018	846	1718	3463	3173	3110	2570	2600	2848	2961	3100

Source: FAOSTAT (2011)


Figure 4.2 : Maize Production in major producing countries of Nile Basin (000 tons)

Source: FAOSTAT (2011)

In all the major maize producing countries, strategies supporting increased access to improved seeds and fertilizer by smallholder farmers (who supply over 75 percent of total agricultural production in the region) and favourable weather seem to be paying some dividends. Kenya was in 2006 and 2007 finally hitting the 3 million tons and meeting domestic requirement, a feat it achieved only once before (in the 1994 season) while Tanzania peaked over 4 million tons in 2002 and 2004. Within the region, only Uganda has had a consistent upward trend in maize output, but the country applies very little high yielding variety (HYV) seeds and fertilizer compared, for example, to Kenya. Productivity in the region is low due to low application of fertilizers, low quality seed and a lack of husbandry practices that would enable the achievement of 7-8 tons/ha experienced in Egypt (Figure 4.3).

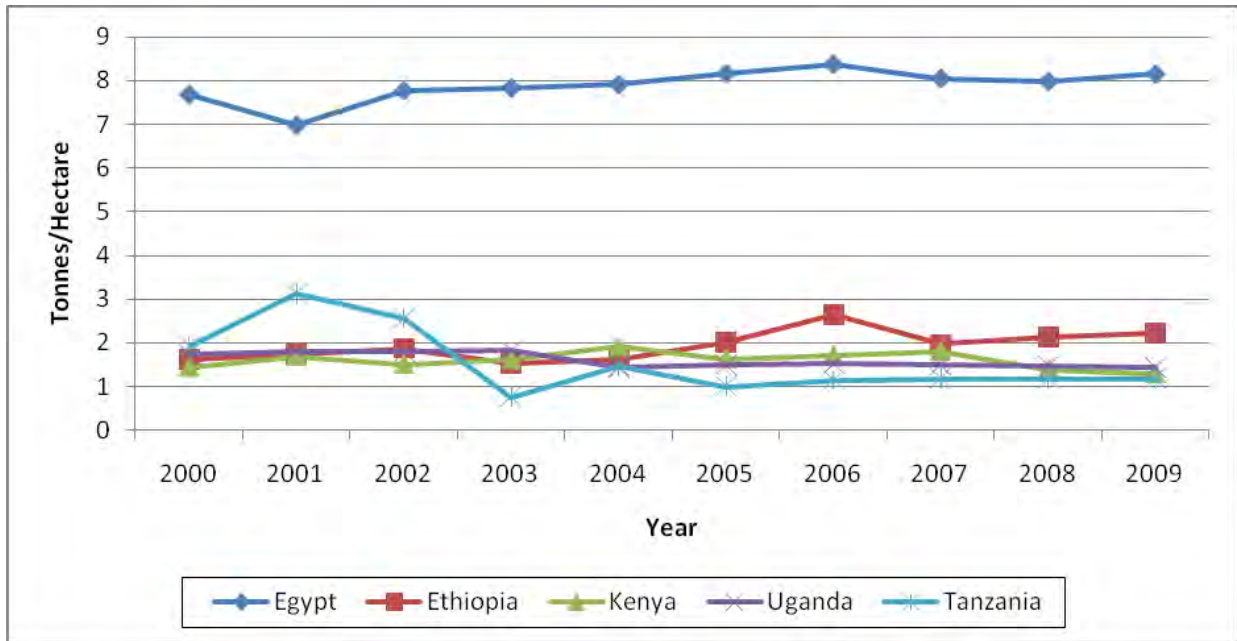


Figure 4.3 : Productivity of Maize in Selected Nile Basin Countries

Source: FAOSTAT (2012)

Maize is the most important enterprise in the region in terms of food security and its consumption has increased considerably over time across the Nile Basin. Despite efforts made to ensure food security in the region, cereals production, generally, and maize supply in particular, continues to fall short of consumer demands thus necessitating imports. The decline in production of food staples like maize has taken place against a backdrop of growing demand for food caused by, among other factors, high population growth thus leading to structural deficits. For Kenya, since the year 2001, the general increase in maize production has resulted in declining deficits and this is expected to improve with more open borders, considering the staggered nature of maize marketing seasons in the region. Within the East Africa region (using statistics for Kenya, Uganda, Tanzanian and Rwanda), the net supply is estimated to improve from a deficit of 201,000 tons in 2009 to a deficit of only 64,000 tons by 2015 (ASARECA/IFPRI, 2005).

RICE

Rice is the world's most popular cereal in terms of consumption. The total area allocated to rice production in SSA is about 8.5 million ha (just about 5.5 percent of total area globally) and Nigeria and Madagascar account for 60 percent of this area. Compared to Asia which irrigates slightly over 50 percent of its rice, the proportion of irrigated area in SSA is a mere 10percent. The SSA yields average 1.5 tons/ha (40 percent of the yields in Asia) and have not changed significantly in the last three decades (Mahabub Hossain, IRRI, 2006). The highest national rice yields reported in Africa (and in the world for that matter) were in Egypt in 2005 and 2006 (Figure 4.4). The Egyptian experience is as a result of irrigation and improved management that are lacking in the other Nile Basin countries (FAO, Newsroom - September, 2006).

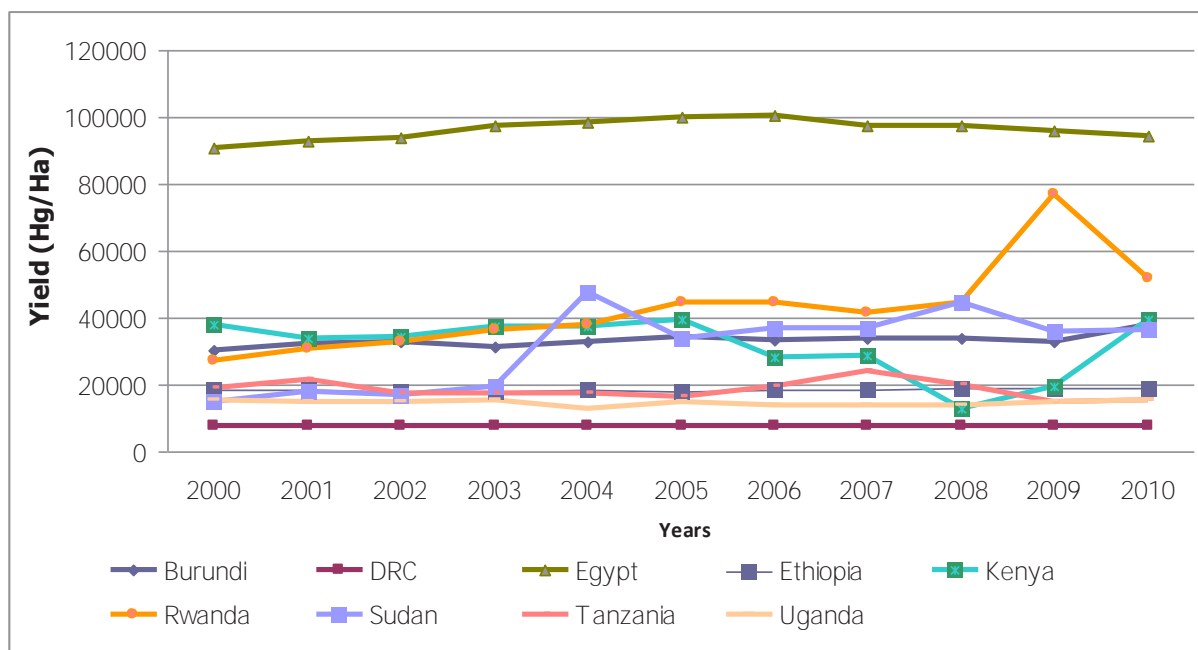


Figure 4.4: Productivity of Rice in Selected Nile Basin Countries

Source: FAOSTAT (2012)

Apart from Egypt, which is by far the largest rice producer in the Nile Basin, the other major producers are Tanzania, Uganda, Burundi and Rwanda (Table 4.9). Production in Kenya which is currently a net importer of rice stagnated at an average of about 45 thousand tons between 1990 and 2004 but the period 2005-2007 saw some marginal increase in production to an average of 60 thousand tons but still this has not been able to meet the demand. Some of the main reasons cited for the dismal performance in Kenya are high costs of inputs, mismanagement of large scale irrigation projects and poor utilisation of donor funds meant to promote production of rain-fed rice in Western Kenya (AfDB, 2005).

Table 4.9: Average milled rice production in selected Nile Basin countries (tons)

Year	Egypt	Tanzania	Uganda	Burundi	Kenya	Rwanda	Sudan	Ethiopia
2000	6000490	781538	109000	51678	52349	11654	8000	15000
2001	5226703	867692	114000	60920	45000	15610	11000	15412
2002	6105456	984615	120000	62648	45000	20976	8000	14000
2003	6176266	1096923	132000	61256	40502	27891	15748	13000
2004	6352370	1058462	121000	64532	49295	46191	36000	12000
2005	6125300	1167692	153000	67947	62677	62194	20000	11244
2006	6755000	1206154	154000	68311	64840	62932	26000	12000
2007	6876830	1341846	162000	70911	47256	62000	23000	11244
2008	7,253,373	1,341,846	171,000	70,911	63,248	82,000	30,000	24,434
2009	7,500,000	-	181,000	-	37,198	80,000	22,500	-

Source: FAOSTAT (2012)

Rice consumption in the region is growing at fast rates, and the commodity is becoming a strong substitute for the more traditional crops due to changing dietary trends, especially among rapidly increasing urban populations. Net supply estimates indicate that, out of all the food commodities, rice will have the highest deficits in the East and Central Africa part of the Nile Basin, with supply shortfall rising from 737,000 tons in 2009 to 1.05 million tons in 2015 (ASARECA/IFPRI, 2005). The global rice consumption (growing at 3.2 percent annually) and the wide yield gap between farmers' fields and the potential levels should act as a strong incentive for governments in the Nile Basin to increase investments in the rice sub-sector. The technologies are already available so more attention will have to be directed towards improving their adoption, uplifting crop husbandry methods and minimising the cost of inputs and irrigation.

BEANS

Farmers plant about 3 million hectares of beans annually in eastern, central and southern Africa, usually as a mixture of varieties (CGIAR website, 2010). Beans are an attractive crop for farmers, because of its adaptability to different cropping systems and short growing cycle. However, beans are susceptible to many diseases and climatic stresses. The common (dry) bean is a major staple food crop in Africa and is valued as one of the cheapest sources of protein for vulnerable sections of the population. Close to 70 percent of bean output in SSA is produced by Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda (FAOSTAT, 2011). The crop is predominantly produced in low off-farm (purchased) input systems by small scale farmers (mostly women) but yield gains of up to 150 percent are possible under optimal management. In the recent past, farmers have been increasingly looking for improved varieties which meet specific market demands and/or varieties which are adapted to local agro-ecosystems. To this effect, between five to twenty bean varieties have been released in seventeen countries in the region⁷ but this does not seem to be having impacts as estimates show that by 2015, the region may be experiencing excess demand to the tune of about 100,000 tons.

According to FAO statistics, production of dry beans in the Nile Basin is dominated by Tanzania (over 800,000 tons per year) followed by Uganda (about 450,000 tons per year); the other main producers are Burundi, Rwanda, Kenya and Ethiopia, whose annual production is in the range of 200,000 to 300,000 tons (Figure 4.5). In general, the production of this commodity has been erratic in the region, despite its high ranking as one of the main food stuffs. Priorities for bean production in the region rely

⁷ (www.ciat.cgiar.org/africa).

on advancing research activities, increasing productivity, enhancing market linkages, and improving knowledge management and utilization. More impact can be achieved by increasing acreage under improved varieties, adopting improved bean management practices (IBMPs) and exploiting regional market opportunities especially in Ethiopia, east DR Congo, northern Tanzania, and eastern Uganda. In the medium term, investments in scaling out dissemination of recently-released varieties and IBMPs can increase bean production in the Nile Basin. In the long term, sustaining benefits to producers and consumers region-wide can be achieved through investments in research to overcome major production constraints.

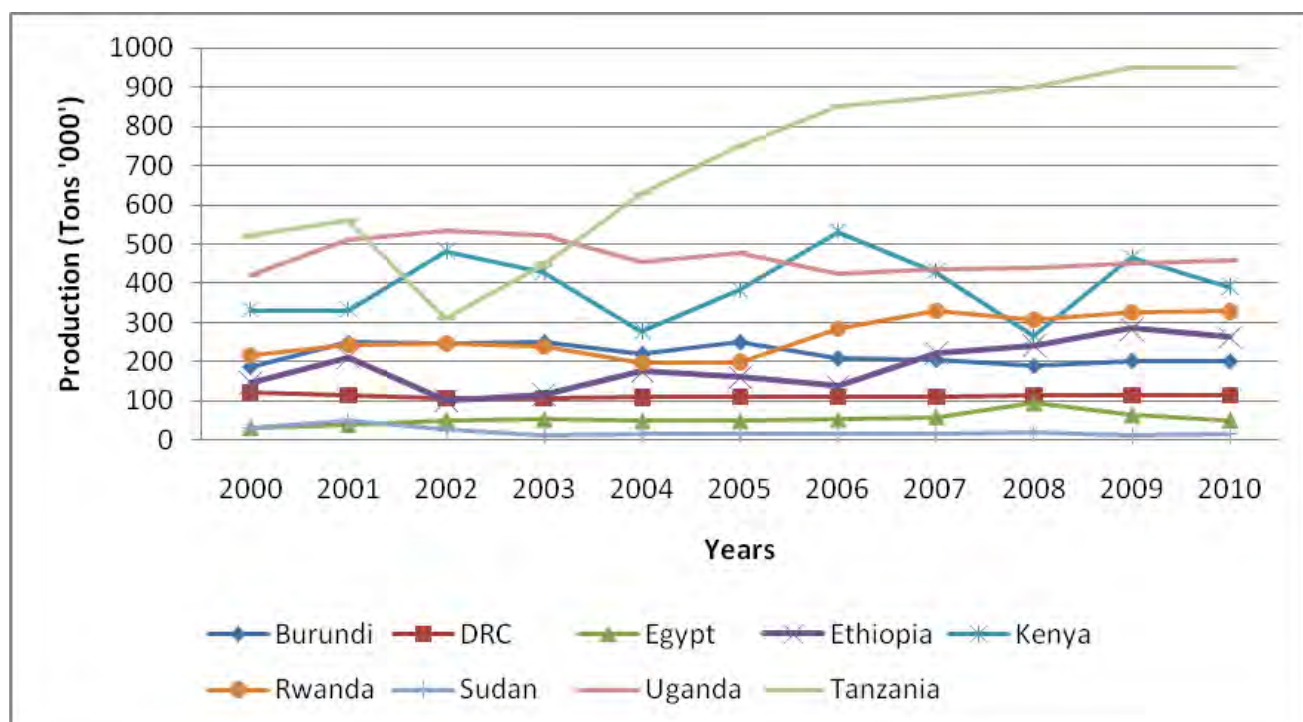


Figure 4.5: Dry beans Production Trends

Source: FAOSTAT (2012)

FRUITS AND VEGETABLES

A large proportion of the horticulture industry within the Nile Basin is still at infancy stage and is based on smallholders who can hardly meet stringent foreign market requirements. The supporting grassroots infrastructure and farmer-based marketing institutions are usually poorly developed. However, a number of countries in the Nile Basin are now venturing more aggressively in foreign markets for fruits and vegetables following the successes demonstrated by Kenya. International trade in horticultural products is growing at a rate of seven percent per year, compared with only two percent for staple crops. According to the World Bank, high-value products can provide an opportunity for farmers in developing countries to compete for a share of this lucrative export market. Because of their characteristics as mainly perishable products, and in view of the comparative advantage enjoyed by the countries producing them, horticultural products offer substantial prospects for export growth within the Nile Basin due to the relative proximity to the growing European markets.

Horticulture has generally experienced an expansion in export levels boosted by favourable international prices but, from 2001, the sector started experiencing substantial fluctuations mainly attributed to new and stringent requirements from international markets. Kenya's experience with horticultural exports shows considerable success and potential. The country has remained the leading exporter in the Eastern Africa region over the years. Largely due to recent government efforts aimed at boosting production and marketing, Ethiopia's horticultural exports have been growing steadily since 2000 when its total export income was about 2.8 million USD, a mere 2.2 percent of Kenya's export income from the same sub-sector in the same year (World Bank, 2004).

Horticulture exports and imports for the other Nile Basin countries are still negligible (e.g. Rwanda and Uganda export less than 50,000 tons each annually thus suggesting opportunities that could be tapped provided that productivity is increased and standards in the lucrative EU market are met. Regional net supply estimates for fruits and vegetables for the period 2009 and 2015 show surpluses that could increase as more smallholder farmers adopt irrigation practices.

BANANAS

Banana production in the region is dominated by Uganda, whose 2010 production is just above 10,000,000 tons, followed by Tanzania (Table 4.10). Limited access to factor markets (labour, land and credit), low private sector investment, lack of value addition opportunities as well as critical biophysical factors (pests, diseases and soil degradation) have led to a decline or stagnated banana production in Uganda. Kenya's production shows a positive trend in the last five years, thanks to increased adoption of improved planting materials (such as tissue-cultured seedlings) but, as in Uganda, the crop is considered merely as a safety-net for food security rather than as a commercial enterprise. The yield potential for the improved planting materials with resistance to the main diseases and pests is 35-40 tons/ha compared to the current average of under 5 tons/ha for Eastern Africa.

Intraregional trade in bananas and horticulture remains subdued largely because of low productivity, subsistence orientation among the smallholders and low levels of value added production. The region recorded the worst performance in merchandise export of bananas with Uganda being its largest exporter of the commodity.

Table 4.10: Banana production in tonnes ('000)

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010
Burundi	1603	1600	1650	1720	1780	1701	1760	620	137
DRC	1509	1521	1513	1507	1514	1520	1522	1516	1566
Egypt	878	871	875	880	855	945	1062	1121	1029
Ethiopia	140	175	182	211	228	250	261	209	172
Kenya	1073	1019	1200	1200	1238	1187	1687	1687	1583
Rwanda	2785	2408	2470	2593	2653	2686	2604	2994	2749
Sudan	74	74	76	75	74	79	84	89	85
Tanzania	2806	2465	2793	3572	4112	3696	3576	3873	3585
Uganda	10503	10303	10288	9608	9617	9805	9954	10104	10150

Source: FAOSTAT (2012) - combination of desert banana and plantains)

PASSION FRUITS

Kenya dominates in the production of passion fruits in the region with an average production of 55,116 metric tons in the last five years. The fruits are mainly exported to Europe though some are consumed in the country and also traded with Uganda and other Nile Basin countries. Kenya is followed by Rwanda at an average production of 13,000 metric tons which is mostly sold within the region. With the high demand for the fruit in the European Union, most farmers are abandoning the production of staple foods like maize in favor of passion fruits. However, a major problem facing passion fruit farmers across the region is an increase in fungal and bacterial diseases, inadequate technical knowledge on crop management and poor post-harvest handling which reduces the quality of the crop. This has forced most growers to stop production altogether. Rwanda has a potential yield of 20-25 tons/ha under normal commercial farming as compared to the current 15 tons/ha. This low productivity is mainly attributed to too many suppliers, supplying too little quantity which results in uncontrolled primary sourcing and lack of coordinated activities, a problem that is common in the Nile Basin countries. With such uncoordinated production and marketing activities it is not known where and when products are harvested and it is difficult to comply with the stringent quality, hygiene and traceability requirements of the European markets. This implies that opportunities for scaling up smallholder production of passion fruits in the region are very limited.

IRISH POTATOES

Irish potato production in the region is essentially for food security reasons. According to FAO statistics, Egypt dominates in production of potatoes with an average production of 2,669,000 metric tonnes in the last ten years and is followed by Rwanda with an average production of 1,181,000 metric tones (Figure 4.6).

There has been a decline in potato production in Uganda and Rwanda over the years, mainly due to the fact that farmers do not use clean seed, and although there are no taxes on agricultural inputs, few farmers use fertilizer or pesticides in their farms. Kenya's productivity has been on the increase in the last ten years because of a strong potato research-extension programme, with emphasis on use of tissue culture and high yielding potato varieties. This is coupled by the strong demand for the potato in major urban areas such as Nairobi. Opportunities for regional and global trade exist but are limited.

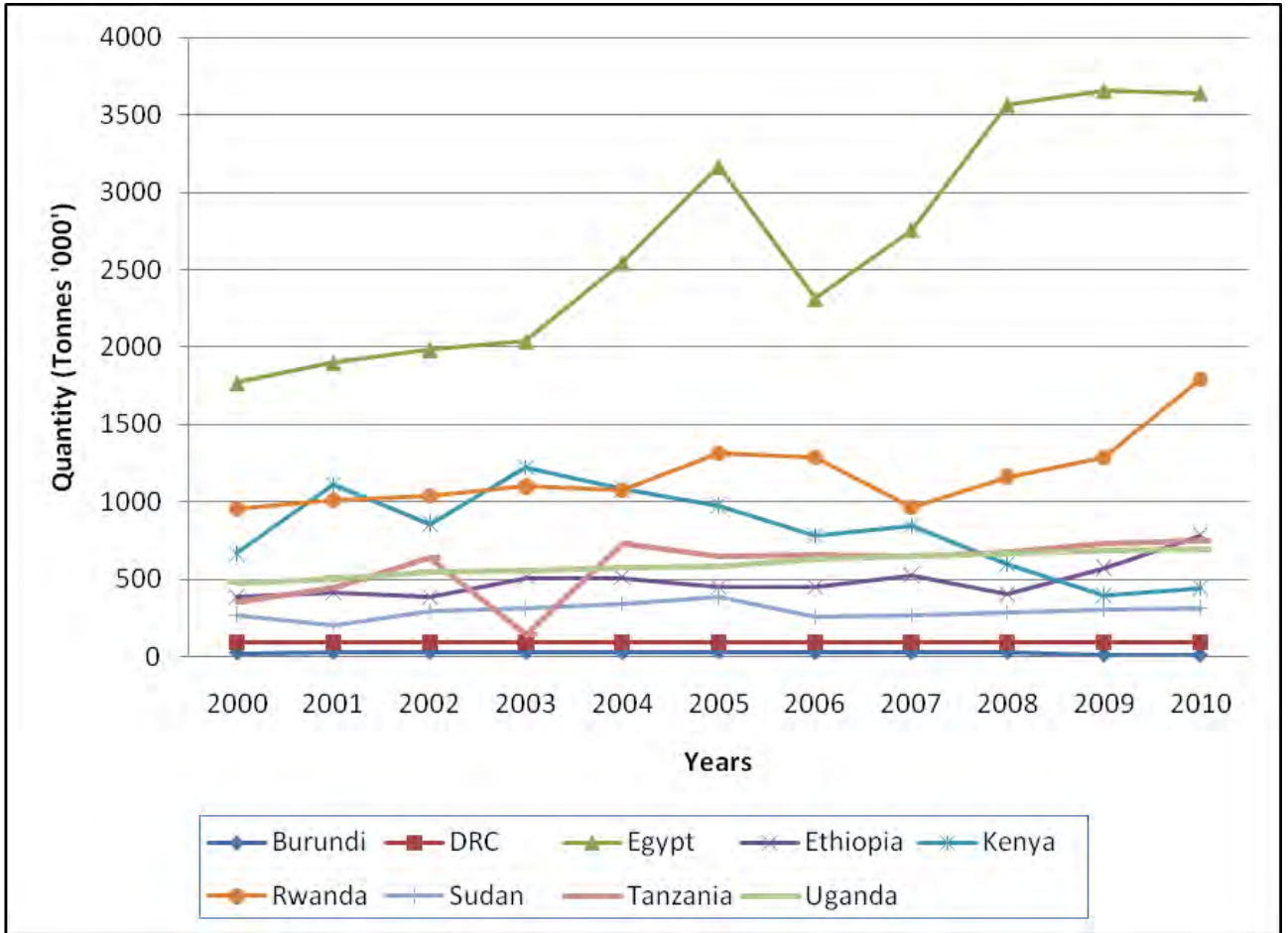


Figure 4.6: Potato Production in Tonnes ('000)

Source: FAOSTAT (2012)

PINEAPPLES

Kenya is the leading producer of pineapples in the region with an average of 61 percent in the last ten years and is followed by Democratic Republic of Congo with an average production of 26 percent (Figure 4.7). Production in Kenya is mainly by large-scale commercial farms with very few small-scale producers. In contrast, pineapple production in Uganda and Rwanda is exclusively done by small-scale farmers. The few small-scale farmers in Kenya are faced with the problem of secure market outlets partly because no processor can be licensed other than Delmonte Kenya (a subsidiary of Delmonte Royal, USA) because of its monopoly status granted by the Kenya Government, and partly due to competition by imports from Uganda. Rwanda has little comparative advantage for large-scale export of pineapples to the European Union, except in small niche markets or in its dried form. The majority of supplier countries ship pineapples to EU markets by sea. DRC and Rwanda have not been able to compete in the EU prices since they do not meet varietal quality and size requirements in that market. The potential of DRC producing and supplying the region with pineapple is largely untapped.

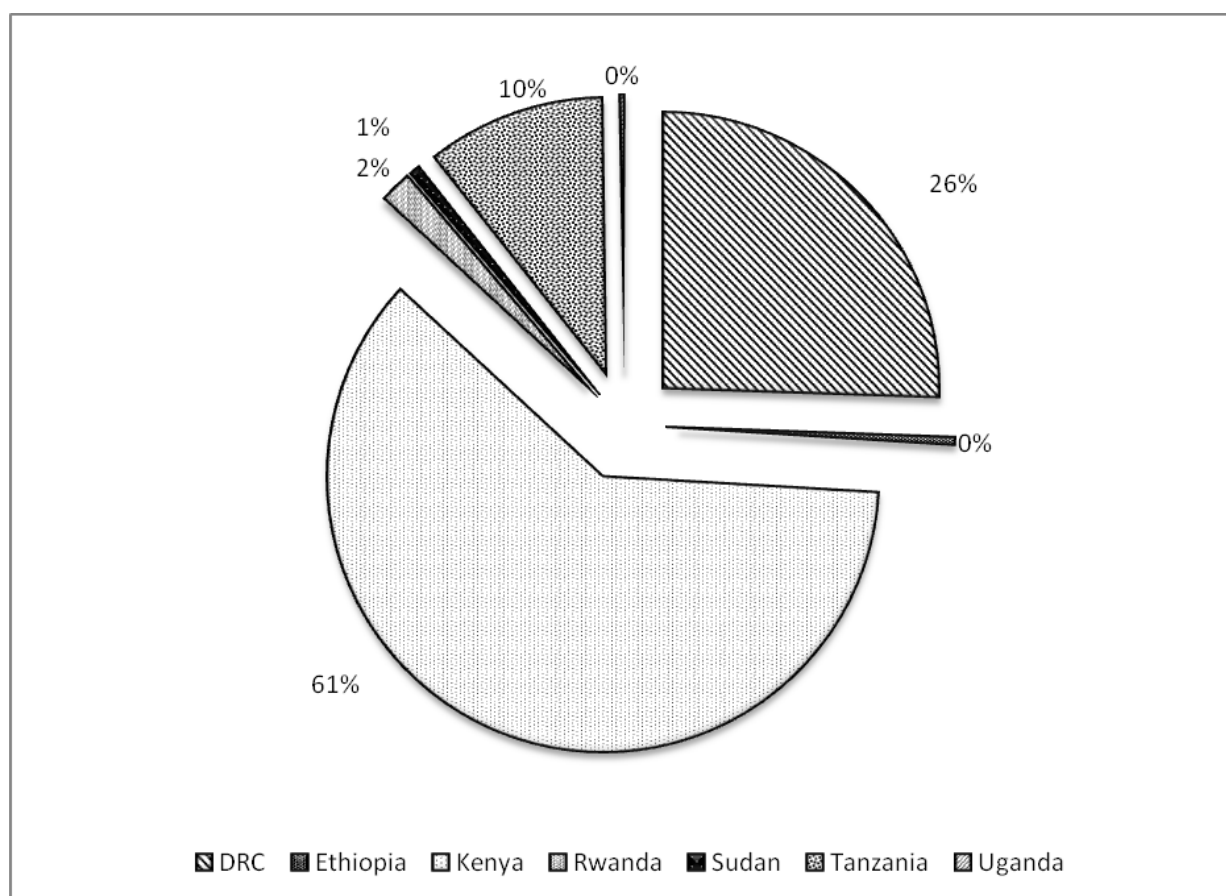


Figure 4.7: Pineapple Production and Distribution in the Nile Basin Region

Source: FAOSTAT (2012) [entries marked zero denote less than 1%]

In Uganda, pineapple production has no clearly documented history. Traditionally, the fruit has been grown for home consumption but in the last two decades it assumed commercial importance in some parts of the country; it is now by far the most widely grown commodity in the fruit crop range and value chain.

LIVESTOCK

Production trends for live cattle depend on grazing conditions in the pastoral areas (state of pasture, water and security). There are a lot of cross-border exchanges in livestock but actual herd sizes at the national levels are rarely known with any degree of certainty since there is no identification and almost all of the countries in the region have not undertaken any livestock census in the past three to four decades⁸. Ethiopia has one of the largest cattle populations in Africa with livestock ownership currently supporting and sustaining the livelihoods of an estimated 80 per cent of the rural population. The majority of the countries however have registered declining stocks of live cattle in recent years (according to estimates) with Sudan (especially the Southern part) that was a major exporter of live cattle during the country’s troubled years going through a restocking period.

Table 4.11 shows the average number of animals in each of the nine Nile Basin countries between 1999 and 2010. Sudan had the highest livestock population by TLU followed by Ethiopia, then Tanzania and Kenya in that order. It is worth noting that countries in the Great Lakes region (Uganda, Tanzania, Rwanda, Burundi and DRC) did not keep camels, probably because those countries are wet throughout the year and the camel thrives well in dry areas. The fact that no camels were reported in Uganda is surprising given that the Karamoja area in north eastern Uganda is relatively dry just like the Turkana County in Kenya, yet the Turkana keep camels. Besides, the high incidence of livestock rustling between the two communities should have introduced camels among the Karamoja, which seems not to have been recorded.

It is worth noting that although countries in the Great Lakes region are wetter and therefore have adequate pasture and water resources, they are prone to insidious diseases⁹ such as trypanosomiasis, *Peste des petits ruminants* (PPR) and contagious pneumonias, whose vectors inhabit the humid subtropical climate and therefore limit livestock production.

Table 4.11: Average population sizes of various livestock species in Nile Basin countries (1999-2010)

Country	Mean (Millions)				
	Camels	Cattle	Goats	Sheep	TLU
Kenya	0.9	13.8	12.60	9.20	12.8
Ethiopia	0.6	42.8	16.30	19.00	34.2
Sudan	3.8	39.70	41.60	49.10	40.7
Egypt	0.1	4.30	3.90	5.10	4.0
Uganda	-	6.74	7.58	1.46	5.2
Tanzania	-	17.97	12.48	3.87	14.2
Rwanda	-	1.05	1.40	0.50	0.9
Burundi	-	0.41	1.32	0.25	0.4
DRC	-	0.77	4.07	0.91	1.0

Source: Derived from FAOSTAT (2012)
 * Population based on country data except for 2000
 TLU = Tropical Livestock Units

⁸ Kenya recently did one in conjunction with the 2009 national population census
⁹See http://web.oie.int/hs2/zi_pays.asp?c_pays=218

CAMELS

Sudan is the leading producer of camels, contributing about 70 percent of the stock in the region (Figure 4.8). It is followed by Kenya and Ethiopia at 18 and 10 percent respectively. Sudan has experienced increasing production trend in camels over the last ten years. The rest of the countries show a constant production trend.

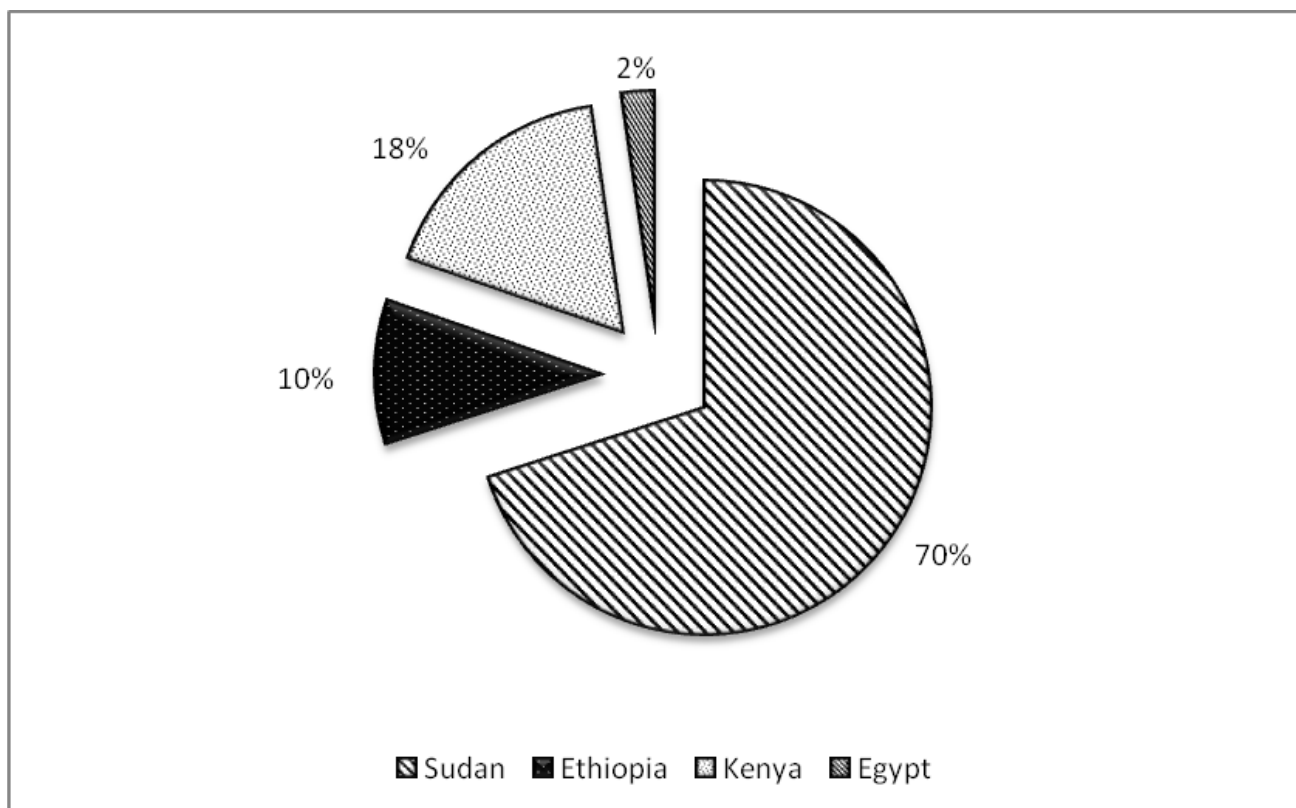


Figure 4.8: Camel Production in Stocks (Head)
Source: FAOSTAT (2012)

CATTLE

Since 2005 Ethiopia has had an increasing production trend in cattle production with the rest of the countries having relatively constant production trends (Figure 4.9). The country is the leading producer of cattle with an average contribution of 34 percent followed by Sudan at 31 percent for the last ten years. There was an upward shift in Kenyan numbers between 2007 and 2008 but since then there has been no real positive growth.

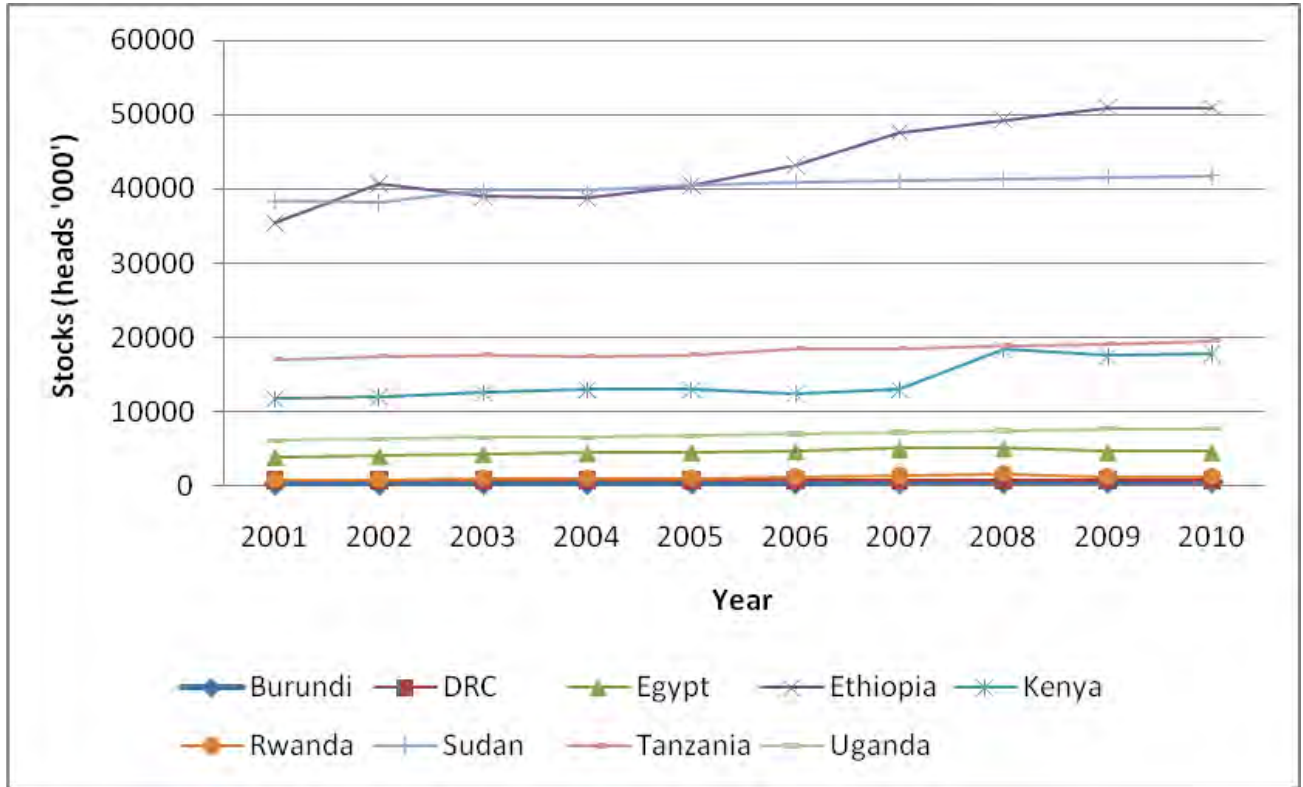


Figure 4.9: Cattle production in stocks (head)

Source: FAOSTAT (2012)

GOATS AND SHEEP

Sudan is the leading producer of goats in the region. It contributes about 41 percent of goat stock in the region, followed by Ethiopia at 16 percent, Kenya at 13 percent and Tanzania at 12 percent. The subsector has had relatively constant production trends in the last ten years though Ethiopia experienced an increasing production trend from 2001 to 2007 (Figure 4.10). Similarly, Sudan is the leading producer of sheep, with more than 50 percent of the sheep stock. It is followed by Ethiopia at 22 percent and Kenya at 10 percent. Most of the countries, with the exception of Ethiopia, have experienced a relatively constant production trend over the last decade. However, the growth trend of both goats and sheep also stagnated in 2007 probably due to the constant droughts in the country (Figure 4.11).

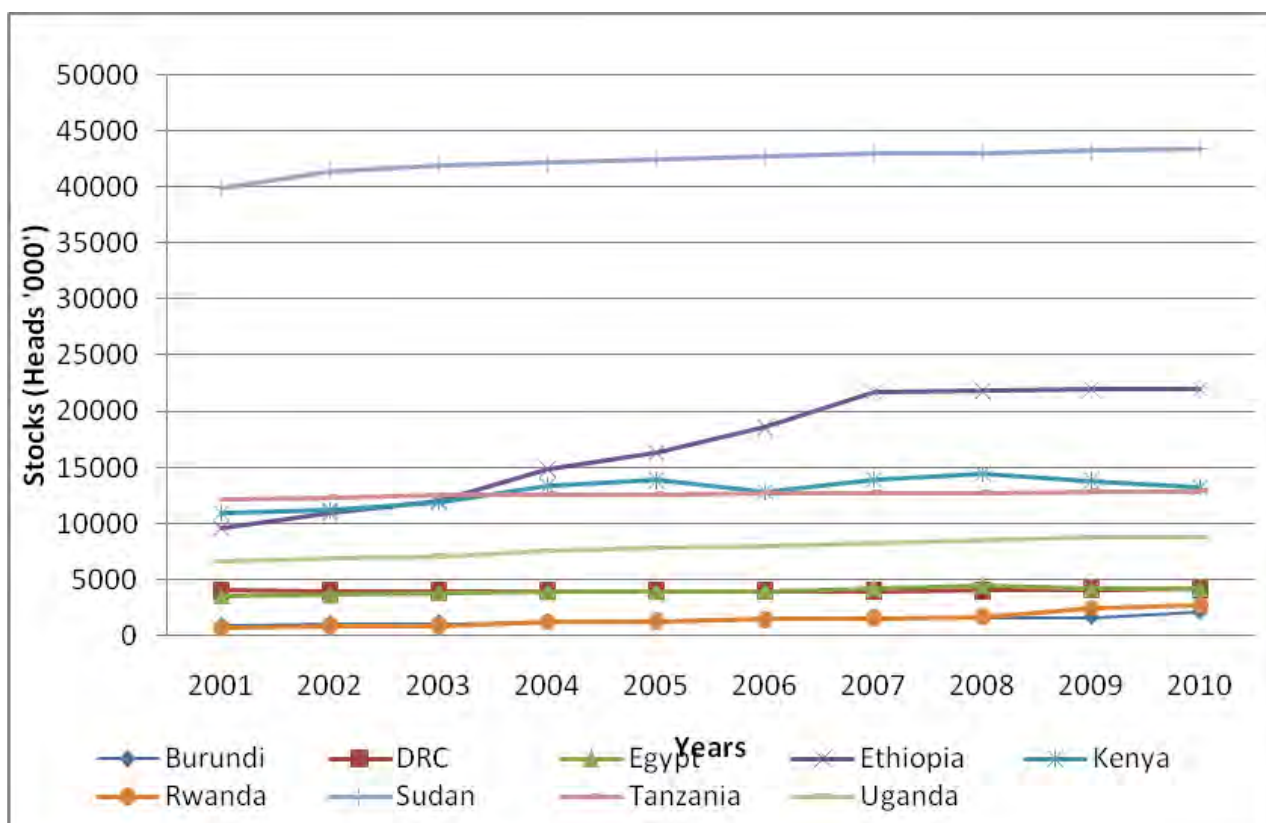


Figure 4.10: Goat Production in stocks (Head)

Source: FAOSTAT (2012)

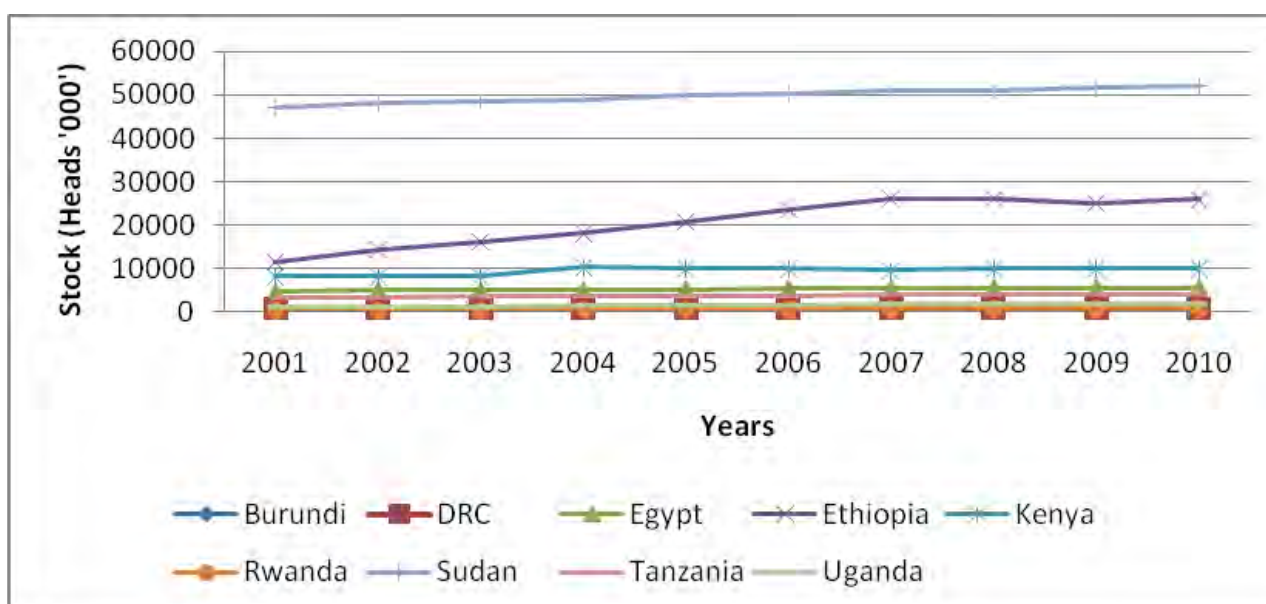


Figure 4.11: Sheep production in stocks (Head)

Source: FAOSTAT (2012)

The Nile Basin countries rely heavily on revenues from livestock trade with countries outside the region (Figure 4.12), the Euro zone being one of its largest trading partners. A number of countries in the region, notably, Tanzania, Sudan, Ethiopia and Kenya, have remained net exporters of livestock and livestock products (LLPs) but net importers of cereals, mainly maize, rice and wheat. The region's export of live animals (mainly cattle) is marked by sharp declines since late 1990s (Figure 4.12). Declining trends are observed for Kenya, Sudan and Ethiopia who have been characterised as having enormous potential for expanding trade in live animals given the large numbers of animals in the countries¹⁰. The fall in exports from the region can be attributed to the many challenges facing the livestock sector in SSA, among them: livestock diseases that limit access to lucrative foreign markets, poor animal husbandry, traditional value systems (so called cattle complex) that inhibit increased levels of commercialization and off-take, recurrent droughts in pastoral rangelands, and weak institutional structures to support the industry. Despite the widespread stagnation in cattle numbers, the region is generally a net exporter of live livestock with the exception of a few odd years such as 1994, 1996 and 2001 as shown in Figure 4.12. Trade flows are usually quite random but droughts in the rangelands, price differentials and civil strife often play significant roles in stock movements. For instance imports rose sharply in 1994 due to the Sudan famine (1993-94) and political strife in Ethiopia.

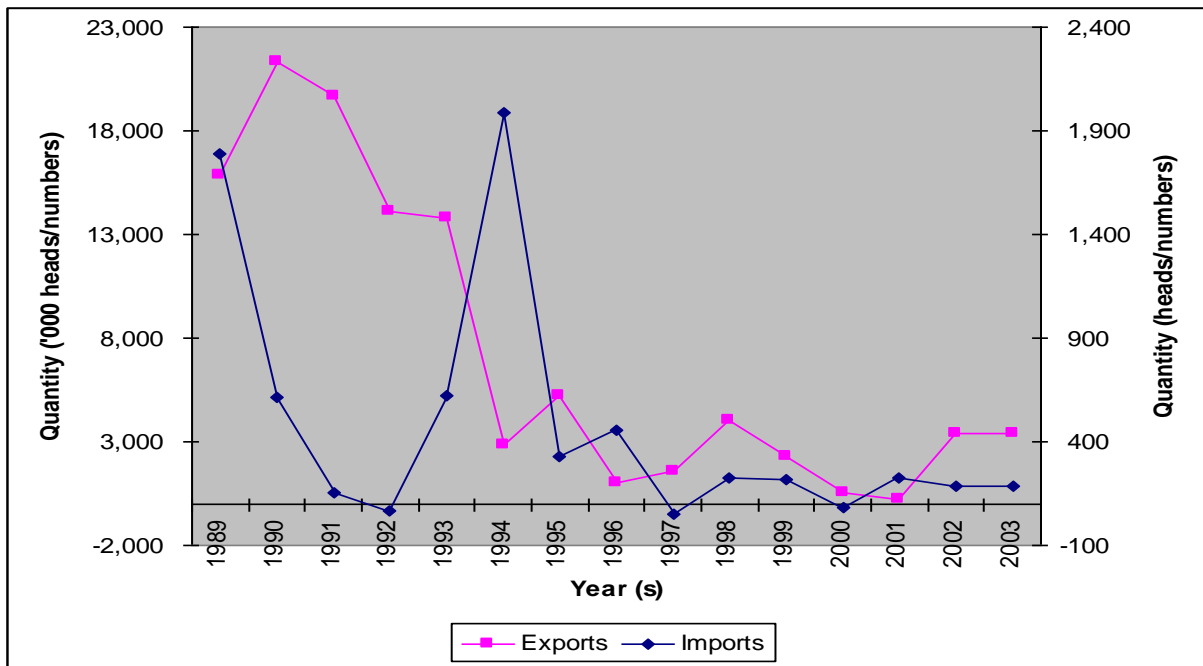


Figure 4.12: The Nile Basin Region's Live Cattle Exports and Imports

Source: FAOSTAT and KIPPRA (2007)

There is considerable potential for development and improvement of livestock production among the pastoralist communities of the Nile Basin who supply some 60 to 70 percent of the domestic market for red meat products. However, investments are needed to develop the rangelands, upgrade livestock breeds and improve access to markets and information. Camel trade across-borders in the Nile Basin is confined to just a few corridors, notably, Sudan/Egypt, as the main trade routes for Kenya/Uganda, Kenya/Tanzania, Sudan/Kenya/Uganda and DRC/Rwanda/Burundi do not feature camel trade at commercial magnitudes. There are different breeds of camel, the main uses being milk, meat, transport and sports (camel racing that apparently is quite popular in Egypt and other Middle East countries). Due to their quick growth, sheep and goats (shoats) that also fall under this cluster are critical components of wealth, food security and post drought recovery in pastoral areas of the Nile

¹⁰ Little, P.D., T. Teka, and A. Azeze (2001)

Basin. Shoats have external market potentials (mainly in nearby Middle Eastern countries) that are yet to be exploited, while, within the region, there are niche markets, for example, for goat milk and its by-products such as cheese that provide opportunities for value addition.

4.2 Structure and Distribution of Consumption in the Region

4.2.1 Grains and Pulses

MAIZE

Egypt is the largest consumer of maize in the region over the years. It is followed by Ethiopia and Kenya respectively (Figure 4.13).

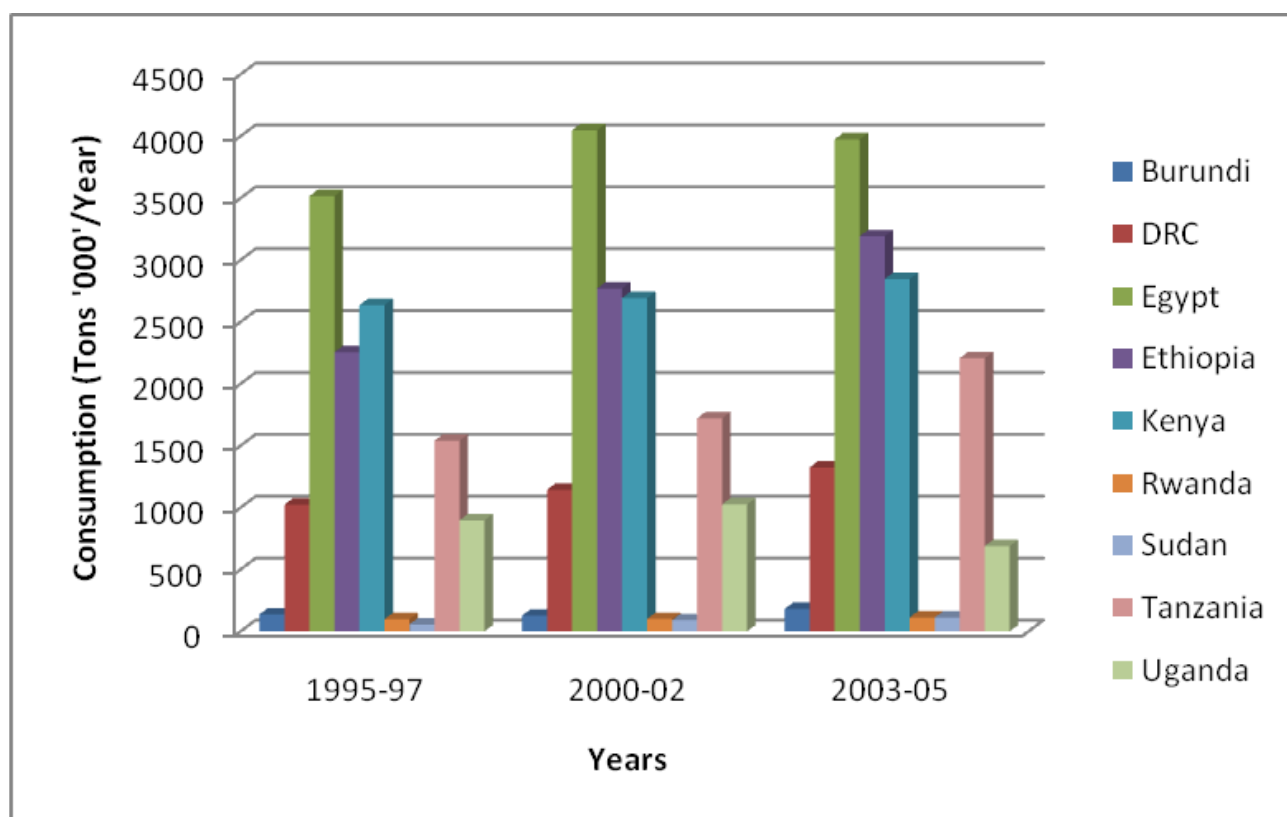


Figure 4.13: Maize consumption in the region

Source: FAOSTAT (2012)

RICE

Egypt is the largest consumer of milled rice in the region. This is in line to its production of the crop. It is then followed by Tanzania and the Democratic Republic of Congo (Figure 4.14).

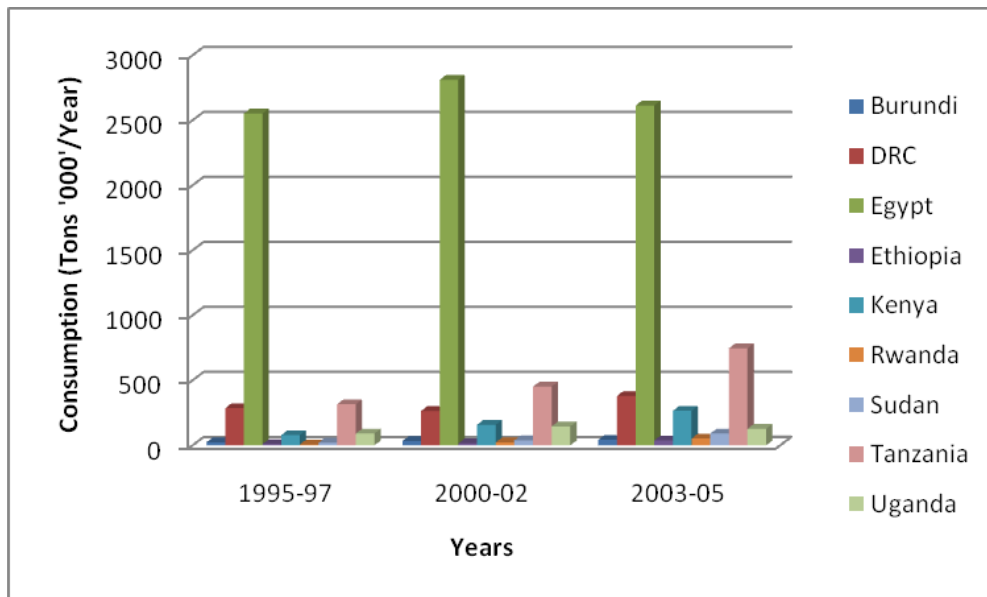


Figure 4.14: Rice consumption in the region
Source: FAOSTAT 2012

BEANS

Uganda had the highest average consumption of beans between 2000 and 2002 while just before that (the years between 1995 and 1997) the country was the second largest consumer after Kenya. Other major consumers of beans in the region include Tanzania and Rwanda (Figure 4.15).

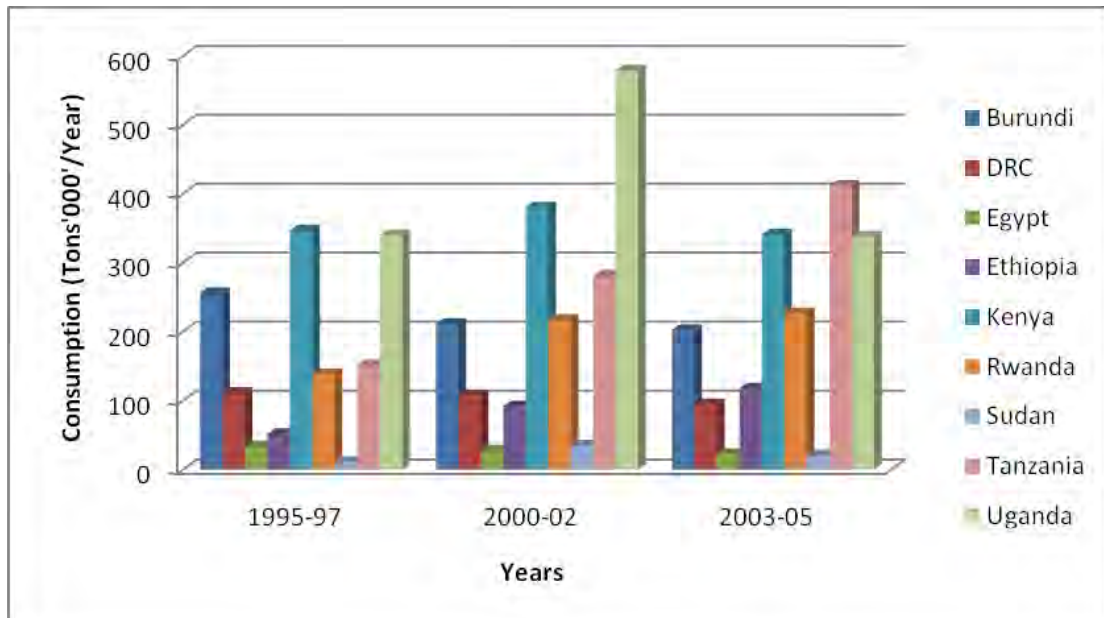


Figure 4.15: Beans consumption in the region
Source: FAOSTAT (2012)

4.2.2 Fruits and Vegetables

BANANAS

Tanzania had the highest average consumption of bananas between 2003 and 2005. The country's consumption had been increasing gradually since 1995/97. The other major banana consumers are Burundi, Egypt and Uganda (Figure 4.16).

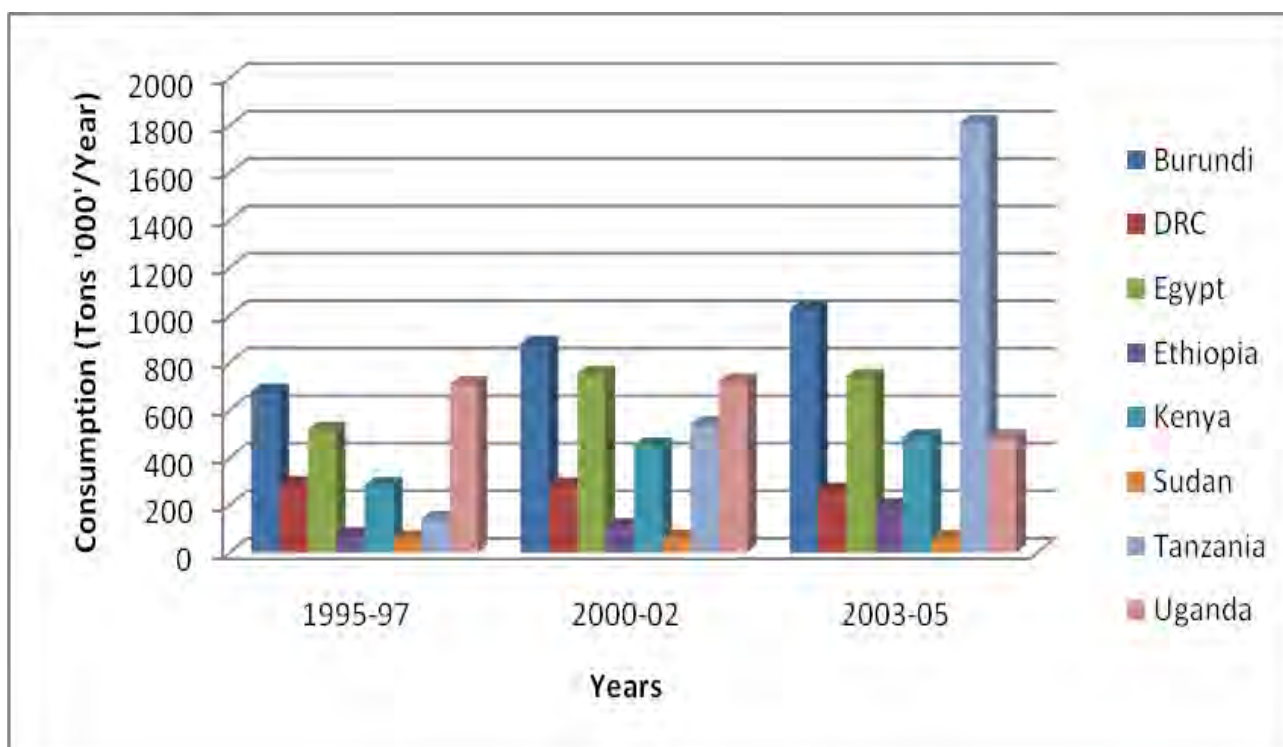


Figure 4.16: Bananas consumption in the region

Source: FAOSTAT (2012)

IRISH POTATO

Egypt is the largest consumer of potatoes in the region, followed by Rwanda and Kenya, respectively. The consumption of Irish potato had a close correlation with the production of the crop as these three countries are also the leading producers (Figure 4.17).

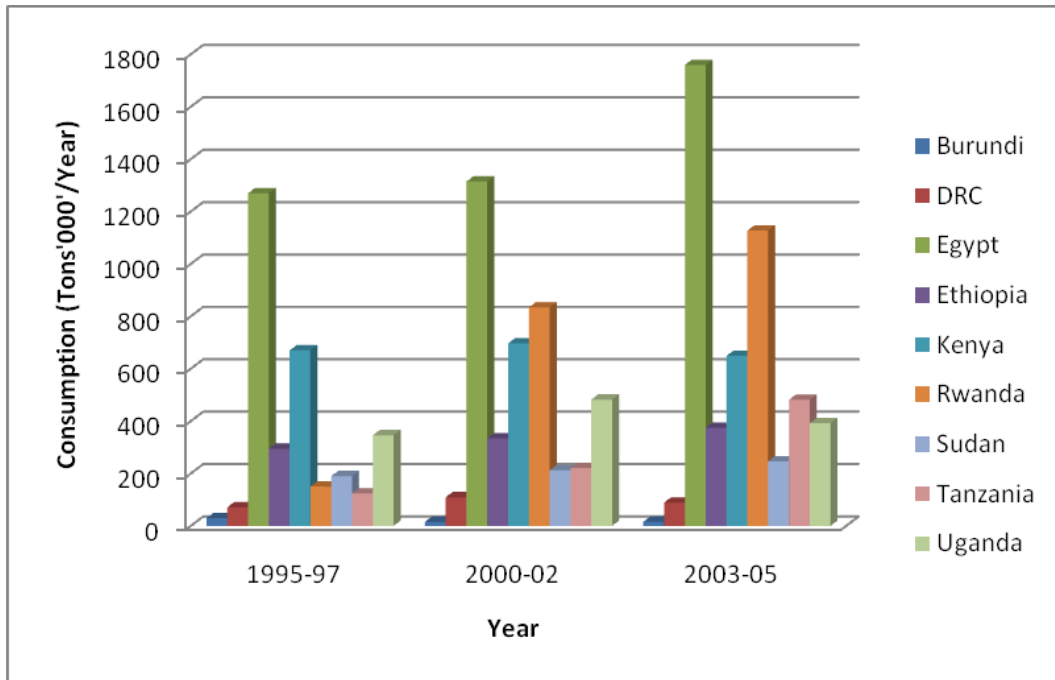


Figure 4.17: Irish potatoes consumption in the region

Source: FAOSTAT (2012)

PINEAPPLES

Kenya has been the leading consumer of pineapples in the region over the years. This is in line with its production of the crop; it is the largest producer of the crop in the region, followed by DRC and Sudan (Figure 4.18).

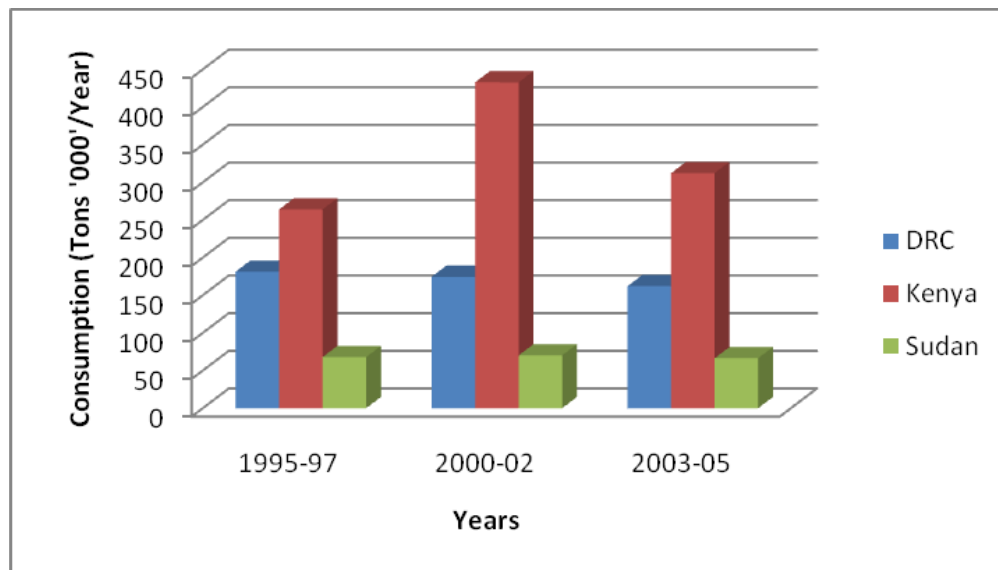


Figure 4.18: Pineapples consumption in the region

Source: FAOSTAT 2012

4.2.3 Live Livestock

BOVINE MEAT

Egypt is the largest consumer of bovine meat in the region. It is then followed by Ethiopia, Kenya and Sudan at almost equal measure. Consumption of bovine meat has increased generally in the countries over the years (Figure 4.19).

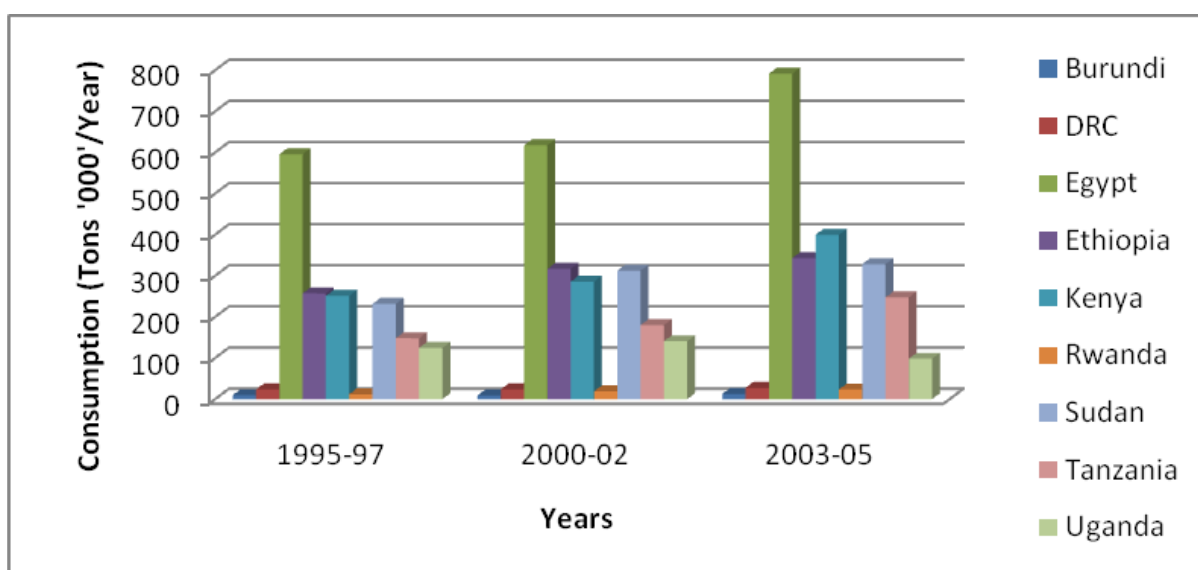


Figure 4.19: Bovine meat consumption in the region

Source: FAOSTAT (2012)

MUTTON AND CHEVRON

Sudan is the large consumer of mutton and chevron in the region and it is also the largest producer. Other large consumers are Egypt, Ethiopia and Kenya while, in comparison, the figures for Burundi were found to be insignificant. (Figure 4.20).

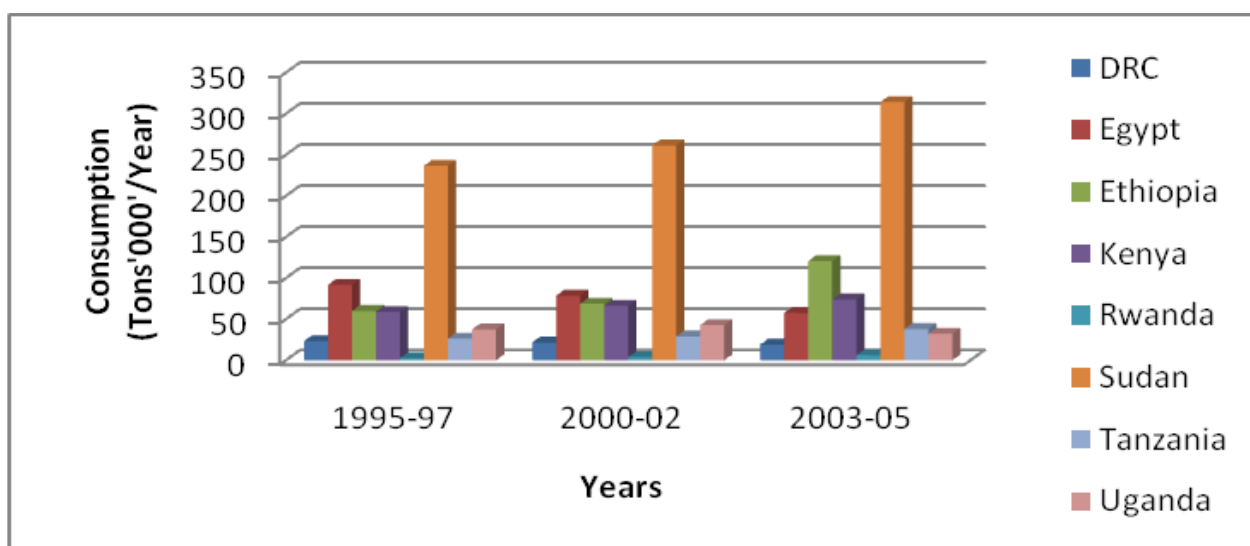


Figure 4.20: Mutton & chevron consumption in the region

Source: FAOSTAT (2012)

POULTRY MEAT

Egypt is the largest consumer of poultry meat in the region; consumption by the rest of the countries are insignificant (Figure 4.21).

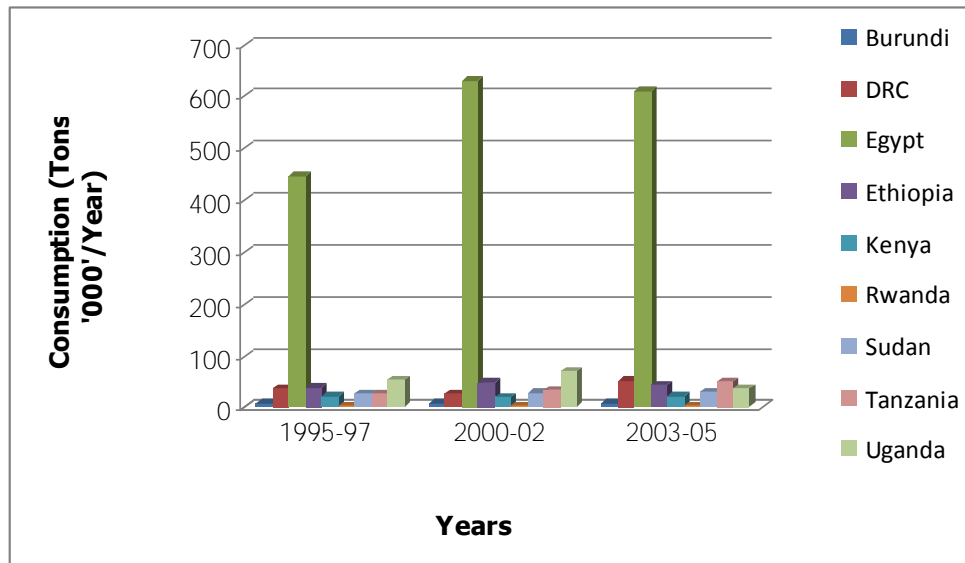


Figure 4.21: Poultry meat consumption in the region

Source: FAOSTAT (2012)

PIG MEAT

Uganda is the largest consumer of pig meat in the region. It is followed by DRC and Kenya. The rest of the countries have very minimal consumption of pig meat or no consumption at all. Lack of consumption in Sudan, Egypt and Ethiopia can be attributed to religious affiliation because most of people in these countries profess the Muslim faith (Figure 4.22).

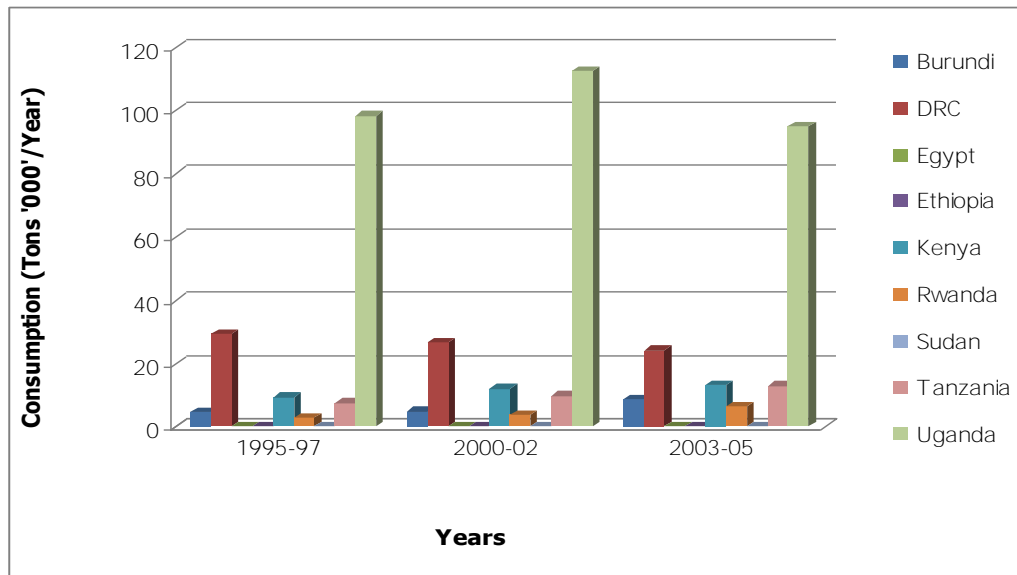


Figure 4.22: Pig meat consumption in the region

Source: FAOSTAT (2012)



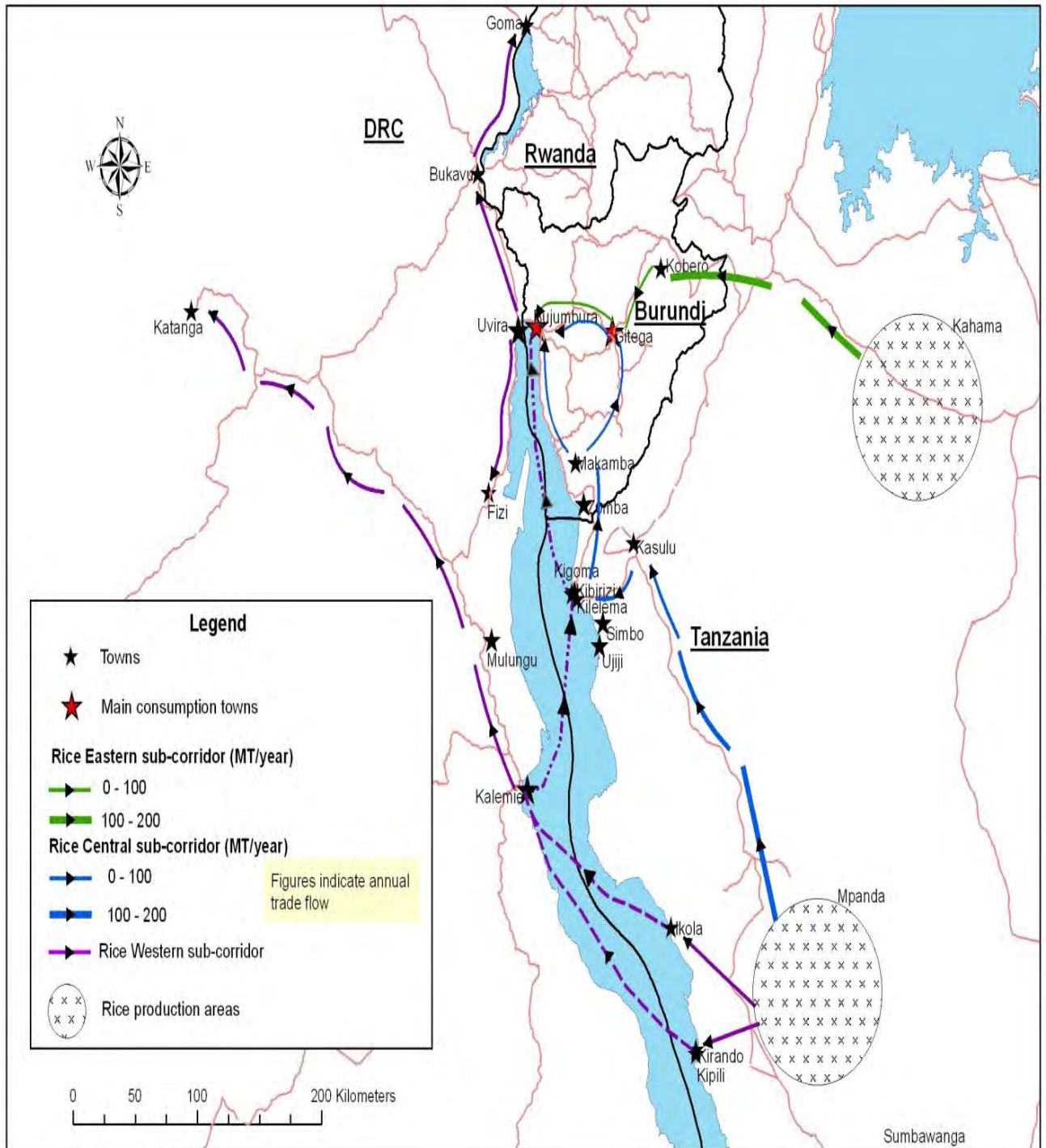
5.0 Corridor and Value Chain Analysis

This chapter provides the identification of production and market areas within the corridors and addresses the following specific issues: characterization of the corridors; assessment of implications of cross-border trade to employment and food security; constraints faced by traders; evaluation of gender and youth dimensions; and assessment of implications of trade to efficient water use. Other issues addressed include functionality of markets; trade methods used by small and large traders; cross-border trade opportunities and specific investment priorities along the corridors.

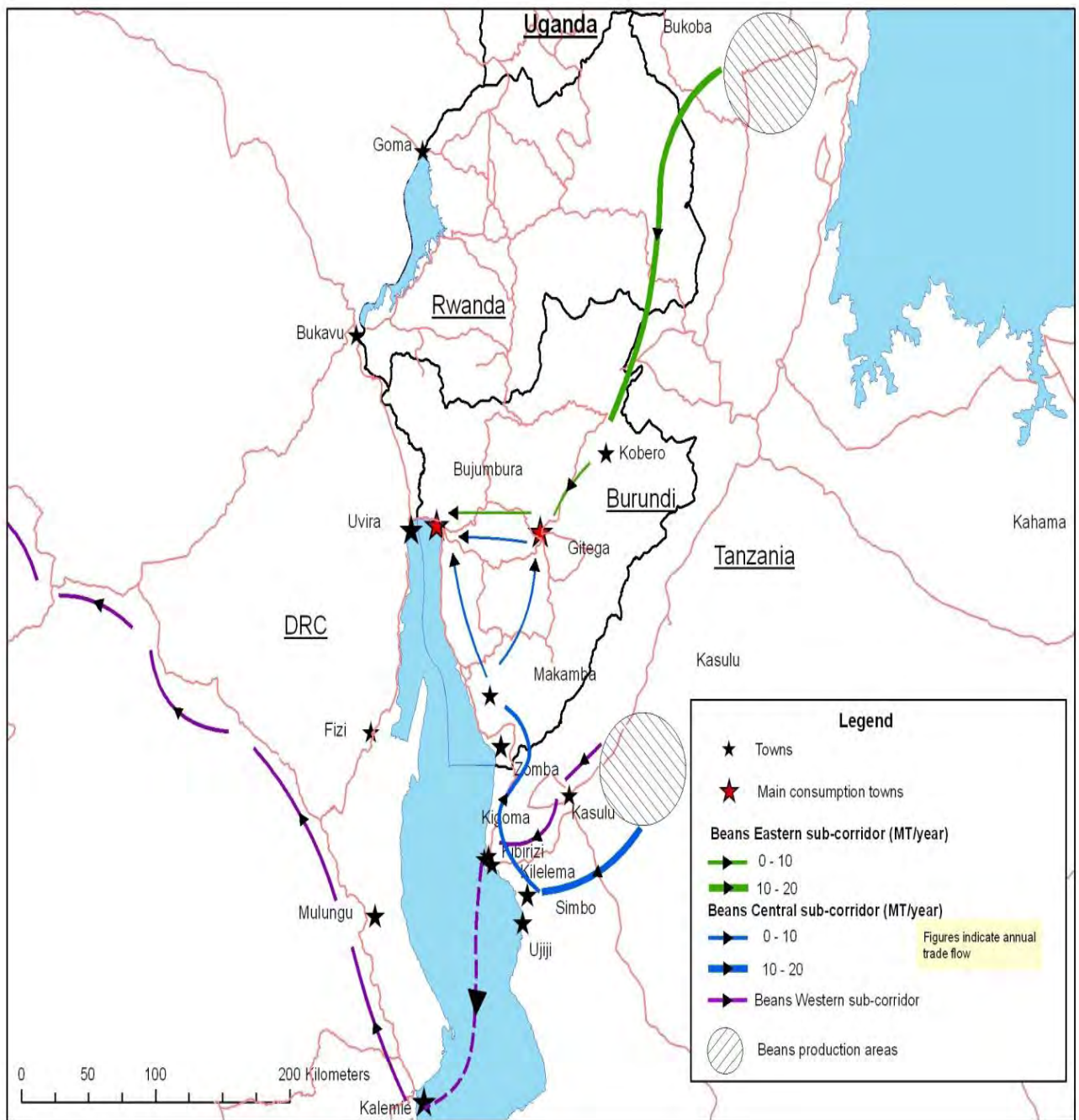
5.1 Western Corridor: Grains and Pulses

5.1.1 Production and trade flows

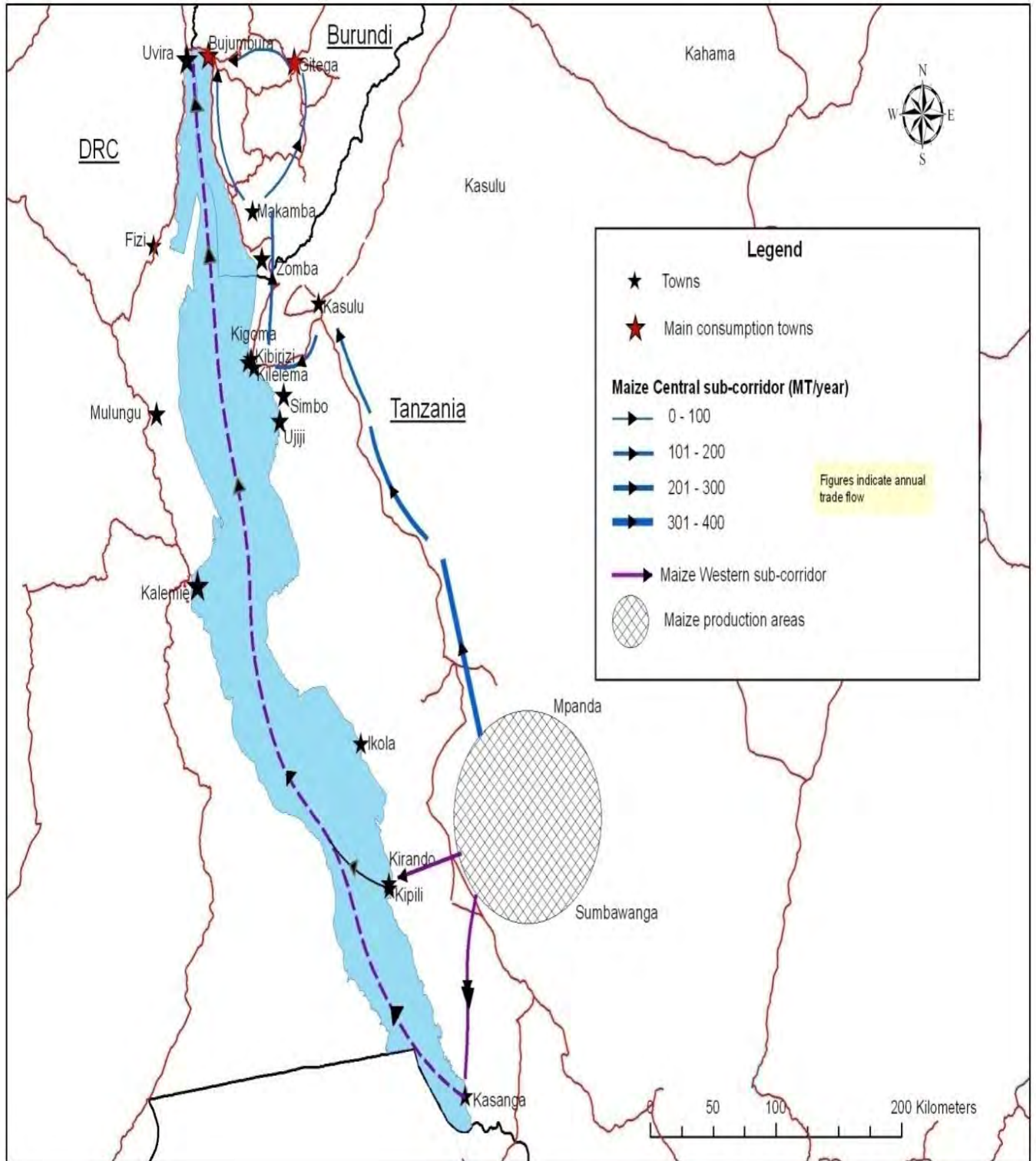
The western corridor is described with regard to the three traded commodities: rice, beans and maize. The corridor had three sub-components as shown in Maps 5.2 – 5.4. Rukwa and Kigoma regions were the main producers and suppliers of traded maize in the Western corridor while rice was supplied mainly by Rukwa region although seasonal production came from the Kigoma region. Beans are produced in almost all areas of Kigoma region particularly in the lowlands. However, the villages with highest concentration of production of beans in the Western Corridor are Nyakitoto, Mgombe, Kusesa, Lunwe Mpya, Muyama, Muhoro, Shunga and Mwali. Bean yield in the highlands averages one bag/acre while in the lowlands the average yield is 5-10 bags/acre (a bag is 120 kg).



Map 5.2: Rice production and consumption areas, and directions and magnitudes of flow in Western corridor



Map 5.3: Bean production and consumption areas, and directions and magnitudes of flow in Western corridor



Map 5.4: Western corridor: maize production and consumption areas, and directions and magnitudes of flow

5.1.2 Production and trade constraints

Most producers and traders in these three commodities face similar production and trade constraints highlighted below:

Low yields to sustain supply: Production is highly dependent on rainfall and the majority of the farmers do not use high yielding seed varieties and fertilizer thus leading to low yields. Although there is demand for the improved technologies, producers complained that their supply is usually low. With the exception of the Sukuma farming community, most of the farmers use hoe/jembe for land preparation and harrowing.

Poor road networks and port facilities: The three commodities are mainly produced in Tanzania and in particular the southern and western regions of the country which normally realize surpluses that can be traded in Burundi, East DRC and northern parts of Zambia. However, the markets suffer from poor organization as well as underdeveloped roads and agro-processing infrastructure. The rural roads in these regions are poorly constructed murrum roads that become impassable during rainy seasons. In addition, the ports in the corridor are in a poor state with no improvements aimed at speeding up trading activities. For example, Soko Maendeleo acts as a market, a landing area and a fishing port. However, like many other informal ports, it has no harbour thus forcing big boats to stop quite a long distance from the port and to use smaller boats to off-load goods. Loading of commodities and boarding is done manually thus leading to increased operational costs and damage of produce by water. Traders complained that the fees collected by the local government were not commensurate with the services provided. There were fears that the poor state of roads and market-related infrastructure in the region will not be able to support the increased business anticipated following actualization of the irrigation schemes.

Lack of storage and market infrastructure: Most of the cross-border markets lacked storage facilities for goods. In general, market infrastructure was either not available or was in relatively poor state. This was more evident particularly in East DRC markets. For example, Soko Maendelo in Uvira lacked storage facilities. Health and sanitary facilities such as wash rooms, clean drinking water and eating places for traders were inadequate and the ones available had dilapidated infrastructure and also lacked electricity (Photo 5.2).



Photo 5.2: Poorly organized and overcrowded grain market

High tax rates and poor harmonisation: The issue with taxes was not just their magnitude but also their lack of harmonisation across the borders. For instance, Burundi levied import duties mainly ad valorem, which included a revenue duty averaging 15–35 percent and an import duty averaging 2–5 percent of the value of the merchandise. The Tanzanian government also levied a four percent statistical tax on all imports. Since June 2011, the government of Burundi has been implementing Value Added Tax (VAT) which has increased prices of imported foods. Consequently, traders of cereals and pulses stated that they try to avoid Burundi and instead favor Kalemie and Uvira in East DRC.

Government bans and lengthy procedures at the borders: The sale of food grains is often disrupted by frequent government trade bans whenever harvests are threatened by drought. Tanzania has often applied this trade policy and invariably this leads to localised gluts and depressed prices. Trade bans interfere with free flow of cross-border trade of commodities and reduces the efficacy of regional integration as a basis for achieving food security. The practice creates unnecessary uncertainty among traders and also aggravates the bureaucracy surrounding the process of obtaining cross-border trade permits even after the bans have been lifted. There were too many regulating institutions operating under different legal and institutional frameworks along the entire corridor and particularly at the borders. The inspections were particularly cumbersome and costly. One of the factors contributing to the delays at the borders is the limited capacity of the regulatory institutions.

Differences in axle load limit requirements: There were differences in axle load requirements among the three countries. For instance, whereas in Rwanda the maximum limit was 7 tonnes per axle, it was 10 tonnes in DRC and 8 tonnes in Tanzania. This has in the process affected timely delivery of products to the destinations. Many traders opted to pay informal charges to avoid delays and inconveniences that arise from off-loading the goods from non-compliant vehicles.

Lack of standard units of measurement: The exchange activities along the corridor did not use a standard unit of measurement. The traders used a 'bakuli' (a tin) as their main instrument for measuring the quantity of cereals and pulses. This measure was very popular in Tanzania, Zambia

and Eastern DRC. The tin weighed about 1.5 kg although it was considered to weigh 1.0 kg. This created a lot of dissatisfaction among farmers and traders in the Western Corridor. There was also no uniform package for cereals and pulses. Bags that were commonly used did not contain a standard quantity: for example, a bag of beans weighed between 120kg and 150kg; a bag of maize weighed 108 kg while that of rice weighed between 140kg and 150kg. Effective standardization is basic to efficient and fair pricing; often, it is the farmer who is exploited by agents and traders.

Inadequate financial resources: Financial capital for small and medium traders was limited in the Western corridor. Most of the traders cited lack of credit and banking system especially for smaller operators. Micro-financial institutions were not readily accessible and the few commercial banks that were available charged exorbitant interest rates and were therefore out of reach of small traders. In East DRC, social capital was well developed and almost every interest group had an association. For example, there was an association for private boat owners, cereals and pulses traders, transporters with large lorries, transporters with small lorries and maize and rice millers.

Communication and information systems: Information and communication systems were also limited in the western corridor. For example, when a boat broke down or there was an attack by pirates, there was no control tower to relay communication. Also, there was no standby rescue boat. This situation was further aggravated by the problem of poor mobile phone connectivity in the region and high interconnection tariffs. Generally, there was lack of market information about prices and regional market opportunities and their respective quality requirements.

Corruption among public officials: Like in any other Nile Basin Country, corruption was a major constraint to the grain traders and transporters in Burundi and informal cross-border traders were feeling it and talking about it feely. In 2011, Burundi was ranked the most bribery prone country in East Africa. Corruption can be defined as “abuse of public power for private gain”. Official corruption takes a variety of forms, including “grand corruption” (mainly in large public procurement or investment projects) and “petty corruption”, i.e., small bribes to government employees to facilitate a service, issue permits, certifications, or licenses, etc. Informal cross-border trade in Burundi was prone to petty corruption and invariably, the police and customs officials propagated the practice. Traders had to pay a ‘soda’ and ‘maji kidogo’ to the police and customs officials to have their goods allowed for passage on the roads. At times they were being coerced to pay some money to avoid trumped up charges by the officers. In some cases, there were established bribery payments by the relatively large traders to secure a constant flow of their goods.

Corruption in informal cross-border trade is a complicated issue. It cannot be tackled successfully by prosecuting a few and small offenders, but must be addressed in the context of a comprehensive reform of the civil service and institutions including customs duties to make them equitable for cross-border traders. The practice of mounting numerous official and unofficial road-blocks along the corridor leads to costly delays that open up opportunities for corruption.

Lack of adequate security: Although markets in the DRC had adequate security apparatus, law enforcement was limited and traders at times experienced commodity losses due theft and/or harassment by armed militias.

5.1.3 The role of different stakeholders in enhancing trade

The governments are the major players in facilitating production and cross-border trade activities with the private sector playing a limited role. However, some farmer movements are emerging in Rukwa region with the help of international development partners. For example, MVIWATA farmer organization is currently promoting access to markets for small-scale farmers through the enhancement of rural markets managed by the main market stakeholders. At the moment, the

organization is implementing “Food Crops Wholesale Markets Development” in Rukwa and Mbeya Regions. The project is mainly funded by the European Commission and is aimed at improving market access for food crops and targets rice and maize from southern highlands regions. The overall objective is to secure sustainable access to locally produced food crops for urban and rural populations at less volatile producer prices.

Farmer groups or associations are working with development partners in various activities of agricultural development. Most of these projects are supported by NGOs, National Agricultural Research Systems (NARS) and micro-finance institutions (MFIs). The NGOs are involved in activities like credit provision, input sourcing, marketing advice, training to improve technologies about agri-business, market information. Examples of specific trade enhancing initiatives in the corridor are summarised below:

- The Tanzanian government has invested in the purchase of power tillers which are distributed at subsidized prices to self-help groups of farmers. Farmers raise financial capital for agricultural activities
- The Tanzanian Ports Authority (TPA) is making some investments in some of the informal ports to enhance trade. For example, Kagunga is a small border port between Tanzania and Burundi. The government of Tanzania is constructing a landing jet at the port town to enhance trade. Other towns where the government is constructing landing areas and go-downs around Lake Tanganyika are Kibirizi, Lagoza and Sumbweza in Kigoma region
- Private sector boat owners in Kigoma Municipality formed an association called “Umoja wa Wenye Maboti wa Kigoma” (UWAMAKI) in 1992. Most of the informal cross-border trade takes place between Rukwa region and East DRC, Burundi and Zambia by use of large boats of 40-60 tons. This organization champions the rights of small boat owners in the Region.
- Boat owners in Uvira – East DRC also have an association known as *Association Cooperative Des Armateurs Du Lac Tanganyika* (ASCOOAT) which champions the rights of their members. The DRC association and UWAMAKI in Kigoma have come together and formed “*Ziwa Tanganyika Muungano wa Wenye Maboti Association*” that also aims at addressing the piracy menace especially in Eastern Congo
- The government of Tanzania provides security at the inland border points between Tanzania and Burundi. At the informal border points of Kilelema and Nyamugali there are army camps which provide a 24 hour surveillance and security. It is however worth noting that this security is not specifically for the trading activities but as part of Tanzania’s border policing given the nature of volatility of its border with Burundi.
- Despite limited government presence in Eastern DRC, the inhabitants are business oriented. Social capital is well developed and is oriented towards trade and business activities. All actors in the value chain have formed self help groups for supporting each other and for raising capital through merry-go-rounds. For example, there are three traders’ association cereals and pulses depots in Uvira namely Kalimambenge Depot, Depot-2 and Depot Mulongwe. These traders’ groups and associations face a number of challenges: poor access to credit; lack of public storage depots; inadequate electricity and water infrastructure; and poor marketing infrastructure
- The Association of Women Entrepreneurs of Burundi [Association des Femmes Entrepreneurs du Burundi (AFAB)] has the mission to promote women’s entrepreneurship in Burundi especially in the area of SMEs. The Government of Burundi encourages women’s associations so that their members could access credit from microfinance institutions
- Efforts are being made to develop small and medium enterprises, trade and services in terms of trader organizations and provision of credit markets through MFIs in Burundi. However, the systems are still at nascent stage and much more needs to be done by both the public and private sector. For example, the Government of Burundi supports this approach and is already working with women’s associations which receive micro-credit through TWITEZIMBERE, a

project funded by the World Bank. Nevertheless, many obstacles hinder progress in SMEs development and trade: absence of a macro-economic policy and development strategies for responding to the needs of small and medium enterprises; lack of training in entrepreneurship; and lack of awareness of the need for savings and credit

- In Kasulu District in Tanzania, there is an association known as *Chakuwaka* belonging to big traders and businessmen. Every member pays Tshs 20,000 per week and has access to several services, including: power tillers for rent at relatively low rates; agricultural inputs; loans to finance business activities. *Chakuwaka* also extends its services such as loans to farmers provided they are able to afford the lending interest rates that are relatively high. It is the only organization in the production area that supports both production and trade for its members

5.1.4 Gender and youth dimensions along the corridor

In the western corridor, production and trade of rice, beans and maize is undertaken by both male and female persons although the majority are male. In DRC, the majority of cross-border traders are women who travel to Rukwa region in Tanzania to purchase the commodities. The majority of women traders in the East DRC are small-scale traders who depend on the modest profits generated from their trade to make ends meet. Most of them rely on agriculture and agricultural commodity trade of cereals and pulses for their livelihood. Women are key stakeholders in most of the consumption markets in the Western corridor. Young women constituted the largest proportion of informal traders in the corridor.

Though trade of agricultural commodities is still dominated by men in Burundi, women have shown the will to participate, especially through the Association of Women Entrepreneurs of Burundi [*Association des Femmes Entrepreneurs du Burundi (AFAB)*] already mentioned in an earlier section of this report.

5.1.5 Implications of informal cross-border trade on employment and food security

Informal cross-border trade of rice contributes to the economies of Tanzania and East DRC at all levels of the value chain. Rukwa region in Tanzania is the major supplier of the three commodities in the Western corridor particularly for East DRC and Burundi. The farmers in this zone produce grains for home consumption as well as for export hence cross-border trade creates employment and generates income for them. Other employment opportunities are highlighted below.

Processing and milling markets and employment: Most of the milling and processing markets of cross-border traded commodities are located at the shores of Lake Tanganyika in Sumbawanga and Mpanda Districts of Rukwa region. Large, medium and small-scale millers especially for rice are concentrated in Kirando and Ikola ports, respectively. This is because most of the harvested rice is transported from the hinterland for processing, milling and packaging. The milling business is largely dominated by small and medium sized enterprises with an installed capacity of up to twenty (20) tons per day during the harvesting period. Although most of the small millers concentrate in milling business, some of them also buy their own paddy, store, mill, brand and sell to their respective marketing channels. While the owner of the mill usually employs only 2-3 people who manage and maintain the mill, there are usually 6-7 other casual laborers/workers paid on commission who are present to help with the other aspects of the milling. During peak season, the number of casual workers can increase to 20 per mill. These include moving the paddy into the mill, taking the rice from the mill, filling the bags and loading the trucks.

Cross-border trade employment: Tanzanian traders purchase paddy at the farm-gate for milling, packaging and storage and is ultimately exported to Eastern DRC and Burundi. Traders from Eastern DRC also travel to Rukwa markets and purchase milled rice which they ship to Kalemie, Uvira and Bukavu markets. Thus, both small and large traders purchase commodities from farmers and trade

them in the informal cross-border markets. As a result, informal cross-border trade features prominently among Tanzanian farmers' and traders' strategies for self employment, poverty reduction and wealth creation because it avails markets for their commodities.

Wholesale and retail employment: Informal cross-border trade is generally an extension of informal trade between neighboring countries and is usually driven by high levels of unemployment and a shortage of essential goods across national borders. Hence it manages to fill the gaps left by an inadequate formal sector. Informal trade is the main source of job creation in the countries covered by the Western corridor and provides an opportunity for employment in the commodities' value chain at wholesale and retail levels locally. The informal cross-border trade between Tanzania and Burundi, Tanzania and East DRC, and Tanzania and Zambia involves both large traders and small scale traders.

Transportation/shipping employment: The transportation sector contributes immensely to the informal cross-border trade process. People with pickups, lorries of 5-7 tons, 8-14 tons, 20 tons and above find employment of their vehicles in this trade. The drivers and the loaders transport produce from farms to millers. Others transport the commodities from mills and stores and distribute them to the local markets or ports for transportation by boats. For instance, in Uvira-DRC, there are both large lorries and small lorries transportation associations. Products landing at Soko Maendeleo are distributed locally by use of lorries or trailers particularly to big towns like Bukavu. Shipping boats of 40-60 tons transport commodities from Kirando and Ikola in Southern part of Lake Tanganyika to Kalemie and Uvira in East DRC.

Youth employment: Informal cross-border trade creates employment for youths at the border markets especially at Ikola, Kirando and Uvira. At Soko Maendeleo in Uvira, for example, youths aged 10 to 25 years off-load rice commodities transported by big boats for transportation to the landing site using smaller boats. They then carry the bags to the open ground in the market for their clients.

Informal cross-border trade provides three types of opportunities: it provides markets for surplus farm produce, and income to the local producers; imports of rice provides food for households that are not able to produce sufficient amounts for themselves whether in the locality of the trade, in the major production markets such as Kirando and Ikola or in the cross-border towns such as Kalemie, Uvira and cities, e.g., Bujumbura; and, generally, cross-border trade serves to ensure food security within the corridor. The employment opportunities highlighted above have significant implications for household food security and regional price stabilization.

5.1.6 Seasonality of production

Most of the grains in the region are seasonal in nature due to dependence on rainfall. Table 5.12 shows seasonality of both Tanzanian rice and local Burundian rice purchase and sales prices at Soko Mjini consumption market in Bujumbura. Production seasons and supply of rice in Burundi and Tanzania are similar due to similarity of rainfall patterns: short rains come in October to December and the long rains in March to May. The Tanzanian rice fetches a higher price than the Burundian rice because of its relatively high quality. In the months of October to December, the supply of Tanzanian rice is depressed and prices (in Tanzania) rise during this period. As a result, most traders avoid Tanzanian rice and instead trade using local rice. Ultimately, due to low demand for Tanzanian rice during this period, its price remains depressed but is still higher than that of Burundi rice.

As in the case of rice, maize trade is also seasonal with the commodity being moved to areas of high demand from surplus production regions. The average yield of maize in Tanzania is 2.5 tons/ha and the major producing regions relevant to the Western corridor were Kigoma and Rukwa. The latter region lies further south of Tanzania but was found to be a year-round maize supplier to the corridor. When the season is normal, only 30 percent of maize from Rukwa comes to Kigoma. Due to lack of

storage facilities, most of the farmers sell their maize immediately after harvest hence the trade flows are closely linked to the rainfall patterns in the producing areas.

Table 5.12: Paddy seasonality, farm gate purchase price and sales price at Soko Maendeleo in Uvira (US\$/kg)

Month	Production activities in Burundi & Rukwa region	Burundian Rice		Tanzanian Rice	
		Purchase price Large traders	Sales price of retailers	Purchase price- large traders	Sales price of retailers
October 2010	Land preparation	1.0	1.0	1.1	1.2
November	Land preparation	1.0	1.1	1.3	1.3
December	Planting	1.1	1.2	1.3	1.4
January	Fertilizer/chemicals	1.2	1.3	1.4	1.5
February	Weeding	1.3	1.3	1.4	1.5
March	Fertilizer/chemicals	1.3	1.3	1.4	1.5
April	Harvesting	0.8	0.8	1.3	1.4
May	Harvesting/storage	0.8	0.8	1.2	1.2
June	Marketing/Storage	0.7	0.8	1.1	1.1
July	Marketing	0.7	0.8	1.0	1.1
August	Marketing	0.7	0.8	1.0	1.0
September 2011	Low stocks	0.8	0.9	1.0	1.0

Source: Constructed by the author in consultation with a group of traders in Bujumbura (2011)

Table 5.13 shows the seasonality and farm gate prices (Tshs/bag) of maize in Sumbawanga, Mpanda and Kasulu Districts.

Table 5.13: Seasonality and Farm Gate Prices of Maize in Mpanda and Kasulu District

Month	Farming Activities	Farm Gate Price for a bag of 110 kg		
		Sumawanga	Mpanda	Kasulu
November 2010	Planting	21.9	26.3	24.4
December 2010	Planting/weeding	25.0	26.9	24.4
January	Weeding	25.0	28.1	24.4
February	Harvest/planting	25.0	28.1	24.4
March	Maturity	25.0	28.1	24.4
April	Weeding	21.9	12.5	15.0
May	Harvesting	11.3	12.5	16.9
June	Harvesting	12.5	15.0	16.9
July	Storage/market	15.6	21.9	20.6
August	Storage/market	16.9	16.9	20.6
September	Storage/market	17.5	18.8	25.0
October 2011	Land preparation	18.1	18.8	26.3

Source: Farm interviews with suppliers, October 2011.

The October 2010-December 2011 and March-May rains of the last one year have been poor with low production being experienced in both seasons. As a result, farm gate prices of maize have been abnormally high due low supply. The cause for price volatility is seasonality of production in the year. During periods of relative scarcity in December to February prices are relatively high. They then drop drastically in March after maize harvest to as low as US\$ 1.1 per kg in Sumbawanga District. The

system of production is rain-fed hence rainfall amounts and reliability determine the quantities supplied, price levels and annual movements.

5.1.7 Use of water in western grains and pulses corridor

Most of the beans traded in the Western Corridor are mainly produced in Lake Tanganyika basin in Tanzania¹¹. The land surface of the basin on the Tanzanian side measures 151,000 km² and contributes about 60 percent of the total runoff to Lake Tanganyika. One of the areas in which water could be used efficiently to enhance production and trade of beans in the Western Corridor is irrigation.

Efficient water use through irrigation: The potential for irrigation to produce grains in the lake basin is enormous but it remains untapped. There are plenty of water and lowland-wetland natural resources which can be used for irrigation purposes in the basin to expand the production of beans in the Western corridor. Currently there are only four irrigation schemes mostly for rice. Beans are also produced but in small quantities. Table 5.14 shows the characteristics of these schemes.

Table 5.14: Irrigation Schemes in Lake Tanganyika Basin in Tanzania

Name of scheme	Location	Acreage (Ha)	Main crop produced	Minor crop produced	Observations
Titye	Lowlands. Ruchugi River	500	Rice	Beans	Operational
Lungwe Mpya	Lowlands. Ruchigi River	115	Rice	Beans	Operational
Msambara	Lowlands, Ruchigi River	90	Rice	-	Construction is complete
Kabanga	Lowlands. Ruchigi River	400	Rice	-	Under plan

Source: Authors' construction in consultation with Government Office, Kasulu, September 2011

The production zone of the Western corridor has a high potential for irrigation that remains unexploited. Out of 312,000 hectares of irrigable land, only less than 1200 hectares have been irrigated. A wide range of water sources for abstraction of irrigation water (including rivers, reservoirs provided by storage dams) can be promoted. Where appropriate, exploitation of non-conventional sources of energy such as wind power and solar energy can be harnessed to pump irrigation water.

There are enormous opportunities for the development partners and the private sector to actively participate in promoting irrigation, either as service providers or as commercial farmers. Service providers have opportunities to supply equipment and devices for water lifting such as water pumps, windmills, solar power units; equipment and devices for irrigation water conveyance and application including water pipes, drip units and sprinkler systems. Investors have a big opportunity in manufacturing locally the above mentioned equipment and to invest in commercial irrigated agriculture as medium or large scale farmers. The private sector through the public private sector partnership arrangement can also get involved in providing support services and direct investment.

Efficient water use through transportation, port and shipping infrastructure investment: Road infrastructure around Lake Tanganyika is relatively poor. The only partly tarmacked road is the one connecting Kigoma and Bujumbura. The rest of the roads are seasonal, connecting relatively long distances between townships on the Lake. Ultimately, road transport is expensive and costly to commodity actors. This has resulted in water transport in Lake Tanganyika playing a major role in both formal and informal trade. Bujumbura, Kigoma and Mpulungu serve as shipping centers for

¹¹ The total catchment of Lake Tanganyika basin as a whole is 239,000 km² and the area of the lake is 32,000 km².

commercial trade between the countries in the lake basin. Shipping lines connect Kigoma (Tanzania), Kalemie and Uvira (East DRC), Bujumbura (Burundi) and other coastal towns as an essential part of inland traffic and trade system in the Western Corridor. Townships on the lake shore such as Ikola and Kirando (Tanzania), Moba and Ubwari Island (East DRC); and Gitaza and Rumonge (Burundi) serve as the main informal trade centers around Lake Tanganyika. Currently, most of these informal ports are used almost in their natural state.

Bujumbura, Uvira and Kigoma are the largest official ports where the respective governments have invested in order to facilitate trade and transportation. Even in some of the well established townships like Kigoma, informal ports such as Kibirizi still have no landing area. However, to enhance efficiency of water transportation and trade, there is need to undertake comprehensive investments on the ports handling informal trade. For example, Tanzania has more than ten (10) informal trade ports where the government is planning to undertake some construction and improvement work.

Rehabilitation of water transport: The African Development Bank (AfDB) is in the process of rehabilitating the Mpulungu port at a cost of over US\$600 million to enhance cross-border trade between Zambia and the Nile Basin countries. The project is intended to cover expansion and development construction works for both Mpulungu port in Zambia and Bujumbura in Burundi. The long term plan of the project will involve the construction of a road and railway connecting Mpulungu and Bujumbura. Once it is completed, the road and railway will enhance regional integration and trade. However, there is need to augment the efforts of AfDB as well as tackling new challenges around the lake particularly between Moba, Kalemie and Uvira in Eastern DRC and on the Tanzanian side. These cross-border trade ports lack landing jetties and go-downs for temporary storage of goods, and most of the times loading commodities and boarding is done manually inside the water.

Water infrastructure and distribution to households and markets: The main types of water schemes in the Western corridor include lakes, dams, springs, pumping schemes (diesel, solar, windmill, hand pumps, etc.), gravity schemes, wells (shallow, medium, deep), and rain water harvesting system. Although the Western corridor is endowed with all these sources of water within the Lake Tanganyika basin, rural production areas, production markets, consumption markets, formal and informal cross-border markets, townships and cities lack clean water for domestic use, agricultural production and sanitation.

Efficient distribution of water use in agricultural households, markets, towns and cities in the western corridor would enhance agricultural production and trade for cereals and pulses. The incidence of water-borne diseases is high because people use contaminated water or have little water for daily use. Access to safe water is less than equitable: consumption varies from a low average of 15 liters to over 45 liters per capita per day. Some communities in the rural production areas walk long distances (sometimes for over 10 km) to fetch water. This takes considerable time, energy and over burdens women. This takes considerable time, energy and over burdens women. If adequate water were sufficiently distributed and supplied to the households, it could be used in production and trade activities.

5.1.8 Estimates of marketing costs

STORAGE ACTIVITIES

Storage infrastructure and post-harvest losses

The most popular on-farm forms of maize storage are improved structures (about 46 percent of all the respondents) and rooms in residential houses. Retailers and wholesale traders store predominantly in open holding grounds (42 percent and 71 percent, respectively), suggesting that there are no permanent storage facilities at these levels. However, processors appeared to be using improved

storage structures, because their operations were generally larger compared to those of farmer/traders and retailers and hence risk of storage losses are relatively larger.

The highest storage related post-harvest losses were registered for maize, or about 11 percent of total maize production at the farm level compared to losses for beans that were estimated at only about 5 percent (of total beans produced). In value terms, however, losses for beans (whose unit prices are higher than for maize) were higher at about US\$ 44 per tonne compared to US\$ 22 per tonne for maize. While these on-farm losses, in the case of maize, were approximately only 5 percent of the value of one ton, the figure may be much higher cumulatively along the value chain hence calling for interventions to minimize such losses. Post-harvest losses for rice are relatively minimal partly due to the fact that the majority of the market actors (over 60 percent) did not store rice. About 29 percent of the producers stored rice in their residential houses while about 40 percent of the manufactures and 20 percent of retailers, the only two groups of actors regularly using formal storage, relied on improved structures that appeared to be relatively effective minimizing losses.

The majority of the market actors did not seem to know precisely the factors that cause damage to their produce, apart from an indication by about 10-15 percent of the respondents that the damage arises from pest infestation during storage. This lack of knowledge about the cause of damage is also interesting and may suggest a need for extension education at the farm level considering that the value of the losses, especially for beans, is quite significant.

Capital Costs

Storage of grains at the market centers and in improved stores is generally more expensive compared to in-house and storage in traditional structures as Table 5.15 shows. Rice storage in improved stores and at holding grounds is much more costly except when compared to storing maize at the market centers which costs about US\$ 92 per ton per year.

Table 5.15: Grain storage operating costs (US\$ per ton of store capacity per year)

Store Type	Maize	Beans	Rice
Improved	24.12	12.90	68.60
Traditional	2.48	4.70	4.04
Room in the house	13.82	4.94	0.72
Holding ground	5.75	23.52	56.18
Market store	91.94	41.30	16.71

Table 5.16 shows that storage structures in market centers fetch higher premiums due to their scarcity value compared for example to traditional stores and improved structures whose available capacities are much higher. Storing maize in the house is particularly expensive since most of the traders use rented houses hence the high cost of allocating space for storage.

Table 5.16: Capacities of different types of grain stores (tons)

Store Type	Maize	Beans	Rice
Improved	123.0	95.0	16.8
Traditional	200.0	262.0	576.0
Room in the house	12.0	12.0	3.6
Holding ground	12.0	6.0	7.0
Market store	1.0	1.5	8.4

Organization: management and ownership of storage infrastructure

Most of the storage infrastructure was self-owned and managed by men; women managed less than one quarter of the stores with more inequalities showing in case of beans. There was some degree of use of group-owned stores and use of government-owned stores in the case of rice but even here, the most popular strategy was self ownership and management (Table 5.17).

Table 5.17: Rice store types and ownership

Type of store	Ownership				
	Self	Group	Rented	Government	Other
Improved	5	9	1	1	3
Traditional	1	0	0	0	0
Room in the house	24	0	0	0	0
Holding ground	0	5	0	5	3
Market store	0	1	1	0	0
Other	1	9	4	0	1
Total	31	24	6	6	7

Analysis of operational costs by marketing channel

Post-harvest losses are generally higher along the informal marketing channels for all the grains largely due to the number of stages goods pass through and lack of proper transportation and storage (Table 5.18)¹².

Table 5.18: Post-harvest losses and value for formal and informal market actors

Crop	Marketing channel	Post-harvest loss (percent of farm level maize production)	Value of post-harvest losses (US\$/ton)
Maize	Formal	1.3	3.22
	Informal	15.8	33.97
Beans	Formal	0.2	11.78
	Informal	7.0	60.36
Rice	Formal	0.1	0.72
	Informal	0.2	1.12

As shown in Table 5.19, informal channel operators do not store their goods in holding grounds and in market stores largely due to their high operational costs especially for maize thus making it difficult to make realistic comparisons.

Table 5.19: Stores operating costs for Maize, Beans and Rice in formal and informal channels (US\$/ton/year)

Store Type	MAIZE		BEANS		RICE	
	Formal	Informal	Formal	Informal	Formal	Informal
Improved	32.57	7.22	15.82	3.55	73.495	0.11
Traditional	--	2.48	--	4.70	--	4.04
Room in the house	5.75	19.90	0.50	6.84	1.18	0.70
Holding ground	5.75	--	23.52	--	56.18	--
Market store	91.94	--	41.30	--	16.72	--

-- denotes "mode of storage not used"

¹² These post-harvest losses account for all marketing costs as opposed to storage related costs that were discussed at the beginning of this sub-section.

TRANSPORT INFRASTRUCTURE COSTS

Prevalent modes of transport and their costs

The prevalent modes of transport for maize by producers were small and big trucks, which also was the case for beans. However, traders and retailers prefer to use human transport for beans. Use of small trucks and bicycles was common in rice transportation by producers while traders and retailers preferred human transport. The cost of transporting rice on bicycles was the highest, averaging US\$ 8 per ton/km compared to use of small trucks (US\$ 0.5 per ton/km). But it was found that the small trucks charged much more to transport maize (about US\$ 3 per ton/km).

Traders using hired transport along the formal channels pay about US\$ 32 per ton/trip for beans and rice but much less for transporting maize (US\$ 13 per ton/trip). In the informal channels transporting rice costs about US\$ 5 per ton/trip and only about US\$ 1.0 per ton/trip for maize and beans.

The highest variable cost during maize transportation that owners or operators of big trucks incurred was the weigh bridge fee (89 USD) followed by costs of other services (22 USD) and parking fee (17 USD). These costs are however not comparable with those of owners of small trucks since traders operated in different routes and distances (Table 5.20). Similarly the disaggregated operating costs of transport in different channels are not comparable due to missing data (Table 5.21).

Table 5.20: Disaggregated operating costs for transport owners/operators using big and small trucks per trip (US\$)

Type of cost	Owner/operator using big truck	Owner/operator using small truck
Fuel	0.01	0.29
Loading	4.24	5.26
Customs	0.01	0.70
Parking	16.52	0.41
Security	-	8.26
Other services	22.32	-
Opportunity cost of time	7.03	-
Other costs	39.37	-
Facilitation fee	3.36	3.52
Weigh bridge fee	88.91	-

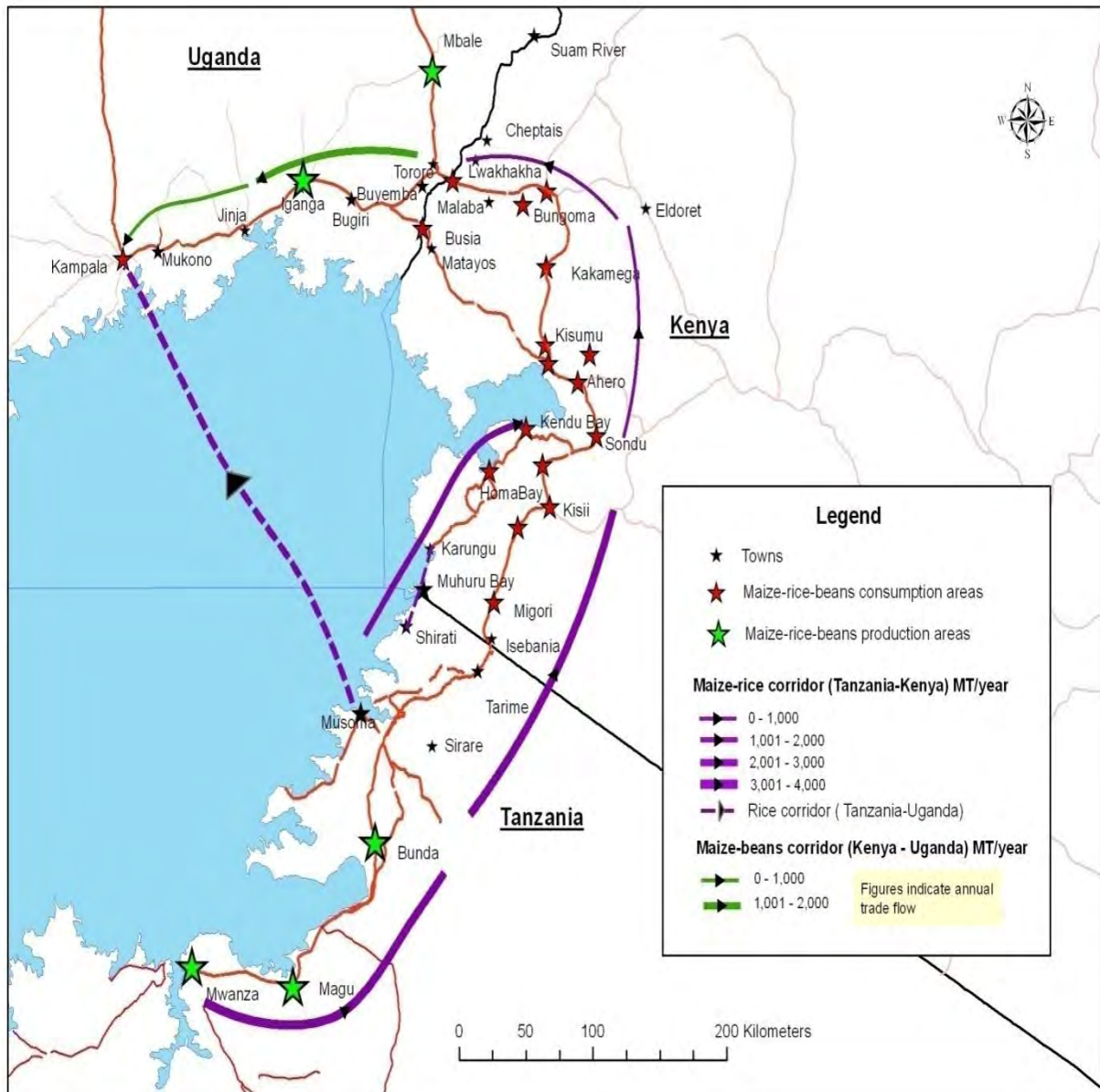
Table 5.21: Disaggregated operating costs for transport using trucks in different channels (US\$/ton/km)

Type of cost	Owner/operator of small truck along formal channels	Traders using small hired trucks along formal channels	Traders using hired large trucks along informal channels
Fuel	-	0.29	
Loading	3.20	4.69	5.99
customs	--	--	0.70
Parking	0.41	0.41	--
Security	--	8.26	--
Other services	28.12	--	--
Facilitation	1.41	--	3.52
Other costs	39.37	--	--
Weigh bridge fee	--	--	--

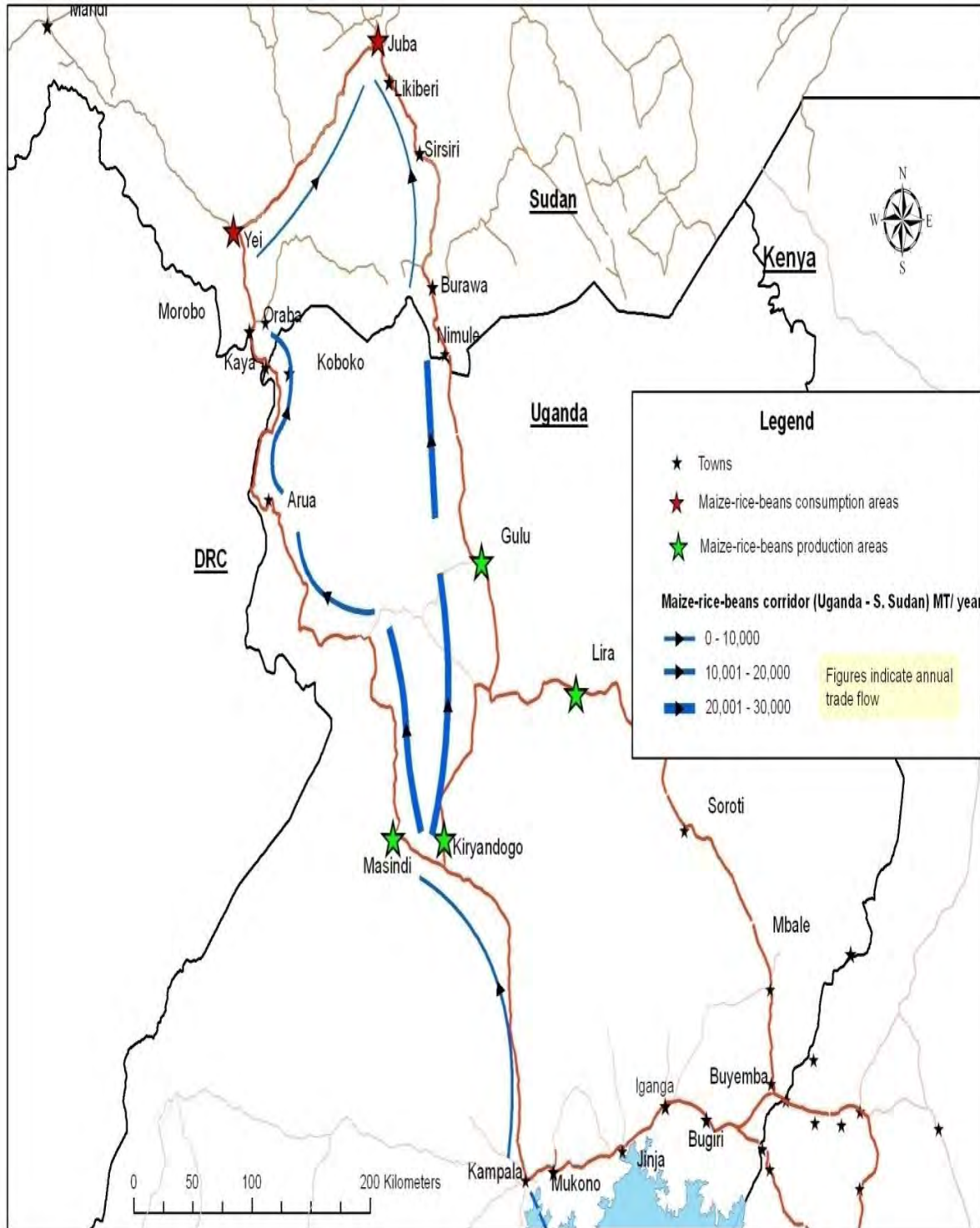
5.2. North-East Corridor: Grains and Pulses

5.2.1 Production and trade flows

The North-East trade corridor for grains and pulses begins in the Shinyanga, Mwanza and Mara regions of Northern Tanzania. The corridor covers 3 main borders: Northern Tanzania/Kenya; Kenya/Uganda; and Uganda/South Sudan. Maps 5.5 and 5.6 show the main production areas and how the commodities flow along the corridors.



Map 5.5: North East corridor: maize, rice and beans production and consumption areas, directions and magnitudes of flow (southern portion)



Map 5.6: North East corridor: maize, rice and beans production and consumption areas, and directions and magnitudes of flow (northern portion)

5.2.2 Production and trade within the rice sub-corridor – Tanzania/Kenya segment

The major production areas are Magu and Bunda Districts in Tanzania. Farmers prefer producing rice to other crops because it is more suited to the weather patterns in these districts. The region receives ample water during the long rainy season and the land is relatively flat and the soils are fertile with a high water holding capacity. There are six (6) irrigation schemes (Table 5.22) which are expected to

boost paddy rice production in Bunda District (in Mara region). The farm gate prices were usually US\$ 0.4 per kg at the beginning of the harvesting season and increased as rice became scarce during the off-season period up to US\$ 0.6 per kg for unprocessed rice. For processed rice the prices were usually US\$ 0.8 per kg at the beginning of the harvesting season and increased to US\$ 1.0 per kg during the off-season period.

There is no uniform trading method adopted by farmers in the production region. Some farmers sell the unprocessed rice at the farm gate, others sell at the processing point to traders (both wholesalers and retailers) while other farmers are traders. The probability and the extent to which a producer adopts any of the mentioned trading methods depends on the level of production, the nature of the roads, the mode of transportation available and costs per bag, availability of capital as well as the liquidity status and the distance from the farm/homestead to the processing point or to the immediate market among other factors. The majority of the small-scale producers sold their unprocessed rice at the farm gate to avoid the transaction costs associated with the commodity beyond the farm while the majority of the large-scale farmers sold the processed rice to traders at the processing point.

Table 5.22: Irrigation schemes producing rice in the corridor

Irrigation Scheme	Description and crop irrigated	Area covered (ha)	Water Source
Mariwanda Irrigation Scheme	It was started in 2010 and is targeting to cover over 200 paddy producers. It is expected to start in January 2012.	220	Dam
Kisangwa Irrigation Scheme	It is still under construction. It is meant to irrigate paddy rice	124	Dam
Serengeti Irrigation Scheme	It is meant to irrigate paddy rice	20	Lake Victoria
Namuhula irrigation scheme	It is meant for paddy and horticultural crop production.	40	Dam
Kasunguti Irrigation Scheme	It is expected to irrigate paddy rice production.	210	Lake Victoria
Bwanza irrigation scheme	This scheme is meant for paddy rice production	110	Lake Victoria
Nyatuari Irrigation Scheme	This scheme is meant to irrigate paddy rice prod	120	Lake Victoria

Source: Authors Compilation from the survey, 2011

The common modes of transport were bicycles, motor cycles, pick-up trucks, tractors and lorries. However, some farmers especially those who belonged to a farmer group, pooled their unprocessed rice together in order to minimize cost of transportation to the processing point. Before selling the rice, such a group of farmers usually rents a store for an average period of three months as they wait for better prices.

From Production to local markets

The immediate markets include Magu and Bunda towns which allow sections dedicated for rice traders. The markets consist of both wholesale and retail traders. The majority of the retail traders are found within the municipal markets where the space per trader is limited to store volumes of rice while the wholesalers are found outside the municipal markets due to the large storage capacity they require. The wholesalers obtain rice directly from processors within the same market. Most traders transact on cash basis to avoid trade conflicts such as default or delayed payments. However, a few

traders have developed trust amongst them and occasionally transact on credit basis depending on the demand for rice and prevailing financial constraints.

On average, most rice wholesalers sold the rice packaged in 100 kg gunny bags although a few traders exceed this weight to either 110 kg or 120 kg gunny bags while others packaged to as low as 90 kg gunny bag. All retailers sold their rice to consumers in small quantities (usually less than 5 kg) and this was carried in polythene bags. The mode of transportation varied across traders depending on the number of bags a trader is purchasing. These included human transport, bicycles, motorcycle, tri-cycle, pick-up (one tonne), tractor, canter (local term for 3 tonne truck) , lorry and big tracks of varying tonnage.

The price of rice varied across the year depending on demand and supply forces. However, at each point in time the prices were almost equal from one trader to the other. During the harvesting season in June, the prices went as low as Tsh 720 per kg and increased to Tsh 2000 per kg during the off-season period. The prices also changed annually due to the quantity of rice harvested which is highly dependent of the amount of rainfall received. Producers who are financially constrained sell their rice immediately after harvesting whereas those with large storage capacities wait and sell in the off-season period when the prices are high.

From Tanzania to Kenya: much faster through informal channels

The commodity crosses the border at Sirari/Isebania point. Most of the rice crosses the border formally through the customs records while some went through the border informally through *panya* (informal) routes such as Solo Set next to the Masafa primary school, Kipimo, Supersonic and Nyametaburo. Traders transported their rice through *panya* routes in order to avoid delays and the high costs involved in clearing the goods formerly at the Customs.

There are established middlemen (brokers) who specialize in coordinating motorbikes to ferry rice through the '*panya*' routes. The brokers minimize the cost of passage of goods at Customs area by mobilizing bicycles and motorbikes whose charges are relatively low. For example, a trailer load of rice carries approximately 300 bags and to clear it the total charge is about Ksh 24,850. Passing the same quantity using bicycles/motor bikes costs approximately Ksh 12,000. Formally, it takes roughly 1 to 2 days to clear a truckload depending on the number of trailers queuing, whereas informally it would take thirty minutes to one hour to pass through the border the equivalent of a 27 ton truck.

The mode of transport across the border both formally and informally was by use of bicycles, motorcycle and trucks of varying tonnage. In addition to these modes of transport, other informal modes were employed including human transport, one ton pick-up trucks, tractor and animal transport (donkeys), the latter being used before 9.00 am, possibly because the animals are used for other farm activities or because during the day other faster modes of transport become more easily available. All informal transporters of rice who use bicycles, motorcycles and vehicles are adult males and young males while most transporters who use animal transport are adult females. Young females hardly participate in trade across this particular border, perhaps due to the risks involved.

The major consumption markets for rice are in Kenya

Migori, Homa Bay, Kisii, Kisumu, Eldoret, Kakamega, Webuye, Kiminini, and Kitale were the main destinations for rice from Tanzania. The retailers in these markets either travel to the border or they organize with the brokers on how rice will be transported up to their premises. Due to financial constraints, retail traders buy (usually on a cash basis) only a few bags of rice that can last for a period of one to two weeks. The price of rice (for the popular packages of 90kg or 100kg bags) varied by season and also increased as the commodity moved far away from the border due increased transaction costs such as transportation, loading and off-loading. The direction of trade flow was

mainly from the Tanzania border to the Kenyan towns mentioned above. However, these markets also received rice from other sources including Pakistan and Mwea and Ahero in Kenya.

Production and trade challenges for rice

Producers cited constraints relating to over-reliance on rainfall that impacts adversely on yields and makes it difficult to schedule supply according to market demand changes. Other challenges mentioned were: High energy costs; poor dam construction; lack of land tenure security (most of the land in the rice producing areas of Tanzania is communally owned); and, high cost of farm inputs (including irrigation equipment, fertilizer, certified seeds and farm credit).

Rice producers and traders also suffer from poor road networks and lack of storage infrastructure all of which lead to that lead to high post-harvest losses and transport costs that in turn make them uncompetitive compared to imported rice. Photo 5.3 shows how rice is stored and handled at local markets along the corridor.

Trade constraints at the immediate and border markets include:

- Information asymmetry works against small informal traders
- High transportation costs due to the high fuel prices
- Low capital to run the businesses
- Low storage capacity and poor storage facilities (Photo 5.3)
- High charges at the municipal authority markets
- Harassment of informal traders by policemen especially when traders refuse to bribe them
- High level of insecurity at night especially on the 'panya' route roads



Photo 5.3: Lack of storage facilities in grain markets

5.2.3 Production of rice and beans in the north east corridor–Uganda/South Sudan

Production and trade characteristics

Rice and beans that are traded along this corridor are produced from Soroti, Mbale, Iganga and Lira districts: the major collection towns are, respectively, Soroti, Mbale, Iganga and Lira. The production areas have two seasons; first season is between March and June while the second one is between August and November. Soroti, Mbale, Lira and Gulu markets are the corresponding intermediary markets for the corridor before the commodity crosses the border to South Sudan at Elegu/Nimule through both informal and formal means. The consumption markets in South Sudan include Juba and Yei.

Fifty per cent of the farmers plant both upland and Nerica rice while the rest plant the upland variety. The farm gate prices are usually US\$ 1.0 per kg at the beginning of the harvesting season and increases up to US\$ 1.3 per kg as rice becomes scarce during the off-season period. There is no uniform trading method adopted by farmers in the production region. The mode of transportation varies across the farmers depending on the volume produced as well as the distance to the processing point.

At Elegu on Ugandan side of the border (between Bibia and Nimule) there is an open market that is held on the last four days of every month. Most buyers at Elegu are consumers from South Sudan (mainly Juba) although a few traders buy to re-sell at Nimule. There are no weighing scales in this market and therefore traders use cups and small containers. Similarly, there are no large storage facilities at this point but some are available at Nimule.

Trade characteristics of the consumption markets

The major consumption markets for rice in South Sudan include Juba and Yei towns. Juba town consists of three markets namely freedom market, Konyokonyo market and Jebel market. Yei town has two main markets - Dar-El-Salam and Jigomoni. The Jigomoni market has a market day on Thursday while Dar-El-Salam market operates on a daily basis. The markets in both towns are organized in such a way that there are produce lines around the market walls while the retailers are inside the market. The majority of the sellers in these markets are retailers and they obtain rice from wholesalers in the same markets. Rice sold in South Sudan comes from both Uganda and Pakistan. Wholesalers from Juba order rice from their counterparts in Uganda. Consumers in Juba prefer rice from Pakistan because it is clean and does not have a high proportion of broken pieces. All rice transactions are made on a cash basis. Rice from Uganda is packaged in bags of either 100 kg or 120 kg and the modes of transport include lorries (7 tonne trucks) and canters (3 tonne trucks) which carry rice in addition to other commodities. Rice from Pakistan is packaged in bags of 50 kg. The prices of rice in South Sudan are relatively high due to high demand and increased transaction costs such as transportation, loading/off-loading and security risks along the corridor.

Production and trade constraints

The key constraints to production include:

- ✓ Low adoption of improved seed varieties due to unavailability, inaccessibility and lack of affordability
- ✓ Low application of chemical fertilizer due to high costs and limited access to credit
- ✓ Poor storage facilities at household level
- ✓ Pests and diseases (rice blast)

Trade constraints include:

- High transportation costs due to the high fuel prices and poor road infrastructure
- High municipal charges at the markets
- Lack of storage facilities and poor waste disposal (Photo 5.4)
- Lack of standard weighing scales
- High cost of clearing the goods formally at the Customs
- High level of insecurity at night especially on South Sudan side
- Problems to do with immigration requirements (especially to South Sudan)
- Corruption among public officials

Roles of different stakeholders in the sub-corridor

The Uganda government, through NAADS, plays an important role in promoting rice production and trade, including:

- Offering financial (provision of start-up farm inputs to poor farmers under NAADS program) and advisory services to farmers
- Regulation of seed quality through investigation and certification
- Building farmers' capacity through promoting production of high quality seeds
- Encouraging seed companies to extend their services (e.g. agro-vets) to rural areas
- Promoting micro-finance institutions so as to provide credit to farmers
- Sensitization of farmers to use certified seeds and fertilizers through the Ministry and NAADS



Photo 5.4 Poor waste disposal in grain markets

In addition to services offered by government, there are various stakeholders on both sides of the border which help in facilitating trade: police and customs officials; and National Chamber of Commerce that issues large scale traders with certificates of origin to reduce delays at the border. The National Chamber of Commerce also arbitrates and conducts trade promotions for the traders through trade shows, radio programs, market research and business forums.

Finally, COMESA offers trade related services to small scale traders (those dealing with goods worth US\$ 500 and below) for example by acting as the clearing agent for the traders in order to minimize delays. Traders are required to register for membership and by paying annual fees in order to get a certificate of origin. Secondly, traders are advised on their legal rights before proceeding to a foreign country. COMESA also gives traders business skills through capacity building and it provides price bulletins/listing.

5.2.4: Production and trade of maize in the North East corridor

5.2.4.1 Description of the Tanzania-Kenya-Uganda-South Sudan maize corridor

The North East corridor starts from Tanzania in Mwanza region, passes through Kenya and Uganda and ends in South Sudan. The corridor is characterized by seasonality differences. Kenya and Sudan act as the major consumption countries while Tanzania and Uganda regions are the major production areas. Border markets include Sirare-Isebania, Busia and Nimule. Other maize inactive trade borders include Malaba border market and Kaya-Oraba market that borders Sudan and Uganda. The main corridor can be subdivided into three active sub-corridors as shown in Table 5.23.

Table 5.23: Maize sub Corridors from the main North Eastern corridors

Sub-Corridor	Production area	Immediate markets	Border markets	Main Consumption markets
Tanzania to Kenya Sub corridor	Mara region especially Tarime	Tarime market	Isbania border point	Migori, Kisii, Nairobi, Machakos
Uganda to Kenya Sub-corridor	Mbale region and Iganga region	Mbale town and Iganga	Busia border point	Kisumu, Nairobi, Kitale, Eldoret,
Uganda to Sout Sudan Sub-corridor	Larger Masindi region especially Kiryandongo District	Bweyale and Masindi towns	Bibia-Nimule border point	Juba, Yei

Maize production areas in Tanzania include Mwanza and Mara regions Busoga and Bugisu regions supply maize to Kenya markets through the Busia border. South Sudan was being supplied by the Northern districts in Uganda notably Kiryandongo District. Seasonality differences among Kenya, Uganda and Tanzania are a major determinant of maize trade.

5.2.4.2 Production and trade characteristics

Despite the large production volumes and increased demands for maize in the neighboring countries along the commodity corridor, maize markets are poorly organized and the institutional structures are inefficient. At the time of the field survey for the study, Tanzania had in place a ban on export of cereals to the neighboring countries. According to Temu (2007), Tanzania maize production is done on an average of 2 million hectares corresponding to approximately 45 percent of the total cultivated land. Some of the country’s maize producing zones include Kigoma, Arusha, Mwanza, Mara, Kagera and Shinyanga regions. The survey established Mara region as the main supplier for the cross-border trade along the Tanzania-Kenya sub-corridor. Land in the region is not a limiting factor both in terms of fertility and size but it is communally owned. On average, households have access to more than five acres but only a third of it is under maize production.

Tanzanian farmers purchase most of their maize planting seeds from Kenya. The farmers prefer the 600 series varieties of maize that usually take six (6) months to mature compared to the Tanzanian bred maize seeds that have a gestation period of 3 months and are not preferred due to their smaller size. Farmers in Tarime District bordering Kenya also purchase fertilizer inputs such as DAP and CAN for maize and NPK for tobacco from Kenya. Although Tanzania produces its own fertilizers, farmers prefer Kenyan imported fertilizers.

In Uganda, maize is widely produced around all the districts in the country. The crop is the third most important cash crop, following bananas and beans. In Mbale, Kapchorwa, Iganga and Masindi regions which are along the North Eastern corridor, maize is considered as the major income earning activity. Production levels have increased over the years due to the increased demand in the neighboring countries. Unlike Tanzania, maize production levels have increased although the farmers are not motivated by the current export ban by the government. Production levels along the corridors differ from one sub-corridor to the other. Variation is mainly caused by the seasonality and other production factors. Crop husbandry methods are still basic with limited use of hybrid seeds and fertilizer.

The Mbale District in Uganda can be divided into three production regions. These are the highland areas, low land areas and the mid-altitude areas. Highland areas produce coffee, bananas, beans, maize, climbing beans, horticultural such as onions, carrots, tomatoes, etc. Mid altitude crops include coffee, bananas, millets, maize, beans, ground nuts, horticultural crops, cassava, and sweet potatoes. The lowland belt produces root crops, millets, maize, beans, ground nuts, paddy rice, and upland rice. The area is well known for supplying Kenya, Rwanda and South Sudan with beans and maize and the increasing demand has led to a surge in producer prices in the district.

The Kiryandongo District in Uganda has a total of 3,609 square km of land under cultivation and maize is now the dominant crop. Other crops grown include cassava, beans, sweet potatoes, ground nuts, sunflower, tobacco, cotton and bananas. Cash crops include maize, cassava, tobacco, sunflower, cotton and beans. The district recorded about 52 tons of maize in the previous growing season (March-August), reaffirming the fact that average yields in the country are still quite low. It is self-reliant in terms of food security and most surpluses are exported to other regions such as Kampala city, Arua, South Sudan and Kenya. However, the district experiences scarcity of beans in some periods and often import from Hoima, Masindi and Lira.

5.2.4.3 Trade characteristics of the border markets

Border markets along the corridor include Isebania-Sirare, Busia and the Nimule points. All these borders are active maize trade with the Busia border point being one of the busiest along the corridor. Nimule border market is busy only during the last few days of the month.

Maize Informal and formal Cross-Border trade at Isebania-Sirare border point

Maize trade along this border point is done both officially and unofficially. The border is under restriction of maize export from Tanzania. Unofficial border points (panya routes) include Kipimo, Kumumwamu, Ntimaru, Nyamutiro, Nyamaharaka panya route, Mutimurabu, Kumbitalele, Kehancha junction, Mali Ngumu and Supersonic areas. As earlier noted, production areas in Tanzania include Mwanza, Musoma and Tarime neighboring Kenyas Kuria-Suba District. According to the traders, some of the maize destined for Kenya from Tanzania comes all the way from Burundi and Malawi. During the months of June and July most of the maize is sourced from Tanzania. From August onwards it is sourced from Burundi and mostly comes under transit. In addition, all maize traded informally across this border finds its way to markets in Kenya.

The informal trade transactions at the border are characterized by numerous cases of bribery: traders pay between US\$ 0.3 and US\$ 0.6 to pass one bag of maize across the border. Most informal traders use mobile phones to complete trade transactions. They use unofficial clearing agents who assemble (bulk) maize for sale. Most of the maize from Kipimo is destined to Nairobi and Eldoret (because of the presence of big millers), especially when the maize around the Eldoret production area is out of season.

Trade at Busia border point

During the period of the data collection for this study (September-November 2011) all the maize traded at the border moved from Uganda to Kenya. It was however observed that when there are deficits in Uganda, the maize is sourced from Kenya. No duty is paid when importing cereals from Uganda to Kenya except for import permits and phyto-sanitary certification. The importation process entails purchasing a certificate of origin and completing C17b depending on the amount of goods (both certificates cost US\$ 56), paying US\$ 6.7 per consignment for importation certificate, phyto-sanitary certification cost US\$ 3.3 for trucks and US\$ 1.3-1.5 for canters. No regulation policies exist which could hinder Uganda from exporting agricultural commodities such as maize to Kenya.

Although the role of the Kenya Revenue Authority (KRA) is to verify certificate issuance and levy official taxes, a *facilitation fee* (a bribe) of Ksh 200 is normally demanded by some corrupt officers. Cereals importation to Kenya is largely controlled by brokers on both border sites and in this regard, they charge Ksh 1,500 for clearance. Informal trade exists across the border where traders try to evade Municipal Council payments at both border points. The payment is Ksh 10 to the Kenyan Municipal Council and Ush 2000 to the Ugandan Municipal Council per bag of imported and exported maize respectively. For informal trade, it costs Ush60 per bag to transport maize from Ugandan to Kenyan border site. This trade occurs along Malachi and Sophia routes. An informal market is well established at the no-man's land along the Malachi *panya* route. Cereals traded in the market are maize, beans, green grams, millet, sorghum, ground nuts and finger millet.

The main mode of transportation is bicycle for trade within 10 km and trucks for long distances such as to Nairobi and Mombasa. Most of the transporters are based in Uganda where there are both individuals and companies. Some of the challenges that transporters face are dishonesty among customers and poor road conditions.

Nimule-Elegu border point

At the Nimule-Elegu Border markets, a border river currently blocks the *panya* routes when it rains. Most trade is informal and the market takes place only during the last three days of the month. During the market days, over 38 trucks of maize originating from Uganda are traded, mostly destined for South Sudan.

5.2.4.4 Production and trade constraints

Maize production levels in the region depend on rainfall and the trends show that productivity has generally stagnated largely due to poor crop husbandry and sub-optimal use of improved technologies. Both producers and traders face a myriad of constraints among them: poor farm-gate prices, population pressure on arable land especially in Kenya and declining soil fertility, poor harmonisation of regional trade policies and high cost of transports that raise input costs. The corridor also faces marketing problems relating to poor road and communication infrastructure, lack of storage facilities, price volatility and lack of integrated marketing structures and systems. In addition, there are increased transaction costs and poor post-harvest handling; poor sanitation; lack of electricity and insecurity risks in some sections of the corridor.

5.2.5 Analysis of storage and marketing costs

Storage infrastructure and post-harvest losses

Among the producers, traditional storage structures and rooms within residential houses were the predominant forms of storage for maize (52 percent and 25 percent of the respondents, respectively). The same trend was evident in the case of beans but more farmers stored their rice in modern structures (41 percent) and in houses (35 percent). The traders, on the other hand, mainly used improved storage structures for all the three commodities (Table 5.24).

Table 5.24: Type of storage infrastructures used along the corridor

Type of store	Percentage							
	Producers				Traders			
	Maize	Beans	Rice	Overall	Maize	Beans	Rice	Overall
Improved	23.3	25.0	41.4	29.7	71.7	80.9	77.9	76.9
Traditional	52.1	22.5	24.1	32.9	5.6	4.5	5.2	5.1
Room in the house	24.6	52.5	34.5	37.4	5.7	0.0	1.3	2.3
Holding ground	0.0	0.0	0.0	0.0	9.4	10.9	9.1	9.8
Stall in the market	0.0	0.0	0.0	0.0	7.6	3.7	6.5	5.9

Producers reported relatively higher post-harvest losses ranging from about 2.6 percent for rice and maize to 4 percent for beans compared to traders whose losses were highest for maize at about 2.2 percent. Table 5.25 shows the corresponding values of these losses by producers and traders. On average, formal traders registered higher losses (US\$ 2.5 per ton) compared to informal traders (US\$ 1.8 per ton) and the value of beans lost was the highest across the board (Tables 5.26 and 5.27). However, in all cases the value of losses to the value of the commodity seems significantly low. The low operating costs by informal traders could be attributed to the fact that they stored the commodities for a shorter period hence they reducing the costs associated with storing the commodities for a longer period of time (Table 5.27). It was also noted that, the holding ground and market stalls were not used by informal traders as storage infrastructures. Perhaps this is because these traders were mostly found along the borders where such storage infrastructures were never organized or would be illegal if found. In all cases, pests were the main cause of damage in storage (Table 5.28).

Table 5.25: The value of post-harvest storage-related losses

Type of crop	Producers		Traders	
	Mean loss (US \$ per ton)	% loss to the value of commodity	Mean loss (US \$ per ton)	% loss to the value of commodity
Maize	3.32	1.4	2.06	0.6
Beans	2.04	0.5	3.30	0.4
Rice	1.96	0.2	1.06	0.1

Table 5.26: Comparative analysis of value of post-harvest storage-related losses

Type of crop	Mean (Us \$ per ton)		
	Formal	Informal	Average
Maize	2.29	1.83	2.06
Beans	4.05	2.55	3.30
Rice	1.13	0.99	1.06
Average	2.5	1.8	2.1

Table 5.27: Comparative analysis of the operating costs of different storage infrastructures between formal and informal traders

Type of store	Mean (in US \$)							
	Maize		Beans		Rice		Overall	
	Formal	Informal	Formal	Informal	Formal	Informal	Formal	Informal
Improved	110.40	98.28	104.24	93.28	99.50	90.94	104.72	94.16
Traditional	83.70	66.74	90.86	66.82	64.62	54.42	79.72	62.66
Room in the house	59.78	41.66	42.98	36.06	60.38	49.06	54.38	42.26
Holding ground	43.40	0.00	40.20	0.00	45.48	0.00	43.02	0.00
Stall in the market	83.20	0.00	80.14	0.00	73.86	0.00	79.06	0.00

Table 5.28: Factors contributing to storage losses

Type of loss	Mean Percentage							
	Producers				Traders			
	Maize	Beans	Rice	overall	Maize	Beans	Rice	overall
Pest damage	66.7	66.2	54.0	62.3	53.0	37.3	23.5	37.9
Natural disasters	6.7	4.6	2.0	4.4	17.0	28.8	14.2	20.0
Fire	13.4	4.6	14.0	10.7	0.0	0.0	0.0	0.0
Spillage	4.4	0.0	6.0	3.5	21.0	10.5	28.9	20.1
Non-use of chemicals	4.4	4.6	11.0	6.7	0.0	0.0	0.0	0.0
Aflatoxin	0.0	0.0	0.0	0.0	4.0	10.5	26.7	13.7
Theft	4.4	0.0	6.0	3.5	5.0	12.9	6.7	8.2
Deterioration in quality due to late or early harvesting	0.0	20.0	7.0	9.0	0.0	0.0	0.0	0.0

Capital Costs

The costs of storage are generally higher for improved structures and storage in market stalls, averaging, respectively, about US\$ 100 and US\$ 80 per growing season, compared to storage in traditional structures and using rooms in residential houses (Table 5.29). Where volumes stored were not too large, rooms in the house appeared to be the most cost-effective form of storage. This form of storage was also made more appealing if the area faced frequent cases of theft and insecurity.

Table 5.29: Operating costs per growing season for different types of storage structures

Type of store	Mean (US \$)							
	Producers				Traders			
	Maize	Beans	Rice	Overall	Maize	Beans	Rice	Overall
Improved	114.34	108.74	114.12	112.26	104.34	98.76	95.22	99.44
Traditional	81.64	82.44	65.94	77.08	75.22	78.84	59.52	71.2
Room in the house	55.12	27.18	58.62	46.96	50.72	39.52	54.72	48.32
Holding ground	0.00	0.00	0.00	0.00	43.40	40.20	45.48	43.02
Stall in the market	0.00	0.00	0.00	0.00	83.20	80.14	73.86	79.06

Organization, management and ownership of storage infrastructure

Among the producers, storage was predominantly the responsibility of males compared to the nearly equitable gender share of that role among the traders (Table 5.30). The producers, in most cases (86 percent) owned their storage structures while the traders relied on rented premises (68 percent).

Table 5.30: Gender of the person responsible for store management

Commodity	Mean percentage			
	Producers		Traders	
	Male	Female	Male	Female
Maize	85.0	15.0	58.5	41.5
Beans	82.0	18.0	52.3	47.7
Rice	83.8	16.2	64.1	35.9
Overall	83.6	16.4	58.3	41.7

Modes and cost of transport

As shown in Table 5.31, traders predominantly used different types of trucks (62 percent for pick-ups, small and large trucks combined) compared to only 10 percent of them who used bicycles. Producers on the other hand relied on motorcycles and bicycles while a few used cheaper human labor and animals.

Table 5.31: Mode of transport along the corridor

Mode of transport	Mean percentage							
	Producers				Traders			
	Maize	Beans	Rice	Overall	Maize	Beans	Rice	Overall
Human	12.5	18.8	10.0	13.7	0.0	0.0	0.0	0.0
Animal/animal carts	12.5	37.5	0.0	16.6	0.0	0.0	0.0	0.0
Motorcycles	9.4	31.3	67.3	35.7	0.0	0.0	0.0	0.0
Bicycles	65.6	12.5	24.7	34.0	9.3	5.7	15.5	10.2
Pick-up trucks	0.0	0.0	0.0	0.0	23.7	10.9	19.6	18.1
Small trucks	0.0	0.0	0.0	0.0	25.8	35.6	41.2	34.2
Big trucks	0.0	0.0	0.0	0.0	9.3	5.7	15.5	10.2

Maize producers seemed to prefer bicycles (66 percent) compared to other modes of transport mainly due to cost considerations (Table 5.32). The poor rural road conditions tended to favour use of bicycles. Among the traders, however, it was more cost-effective to use large trucks to benefit from economies of scale; using bicycles at this level costs about twice as much as use of large trucks.

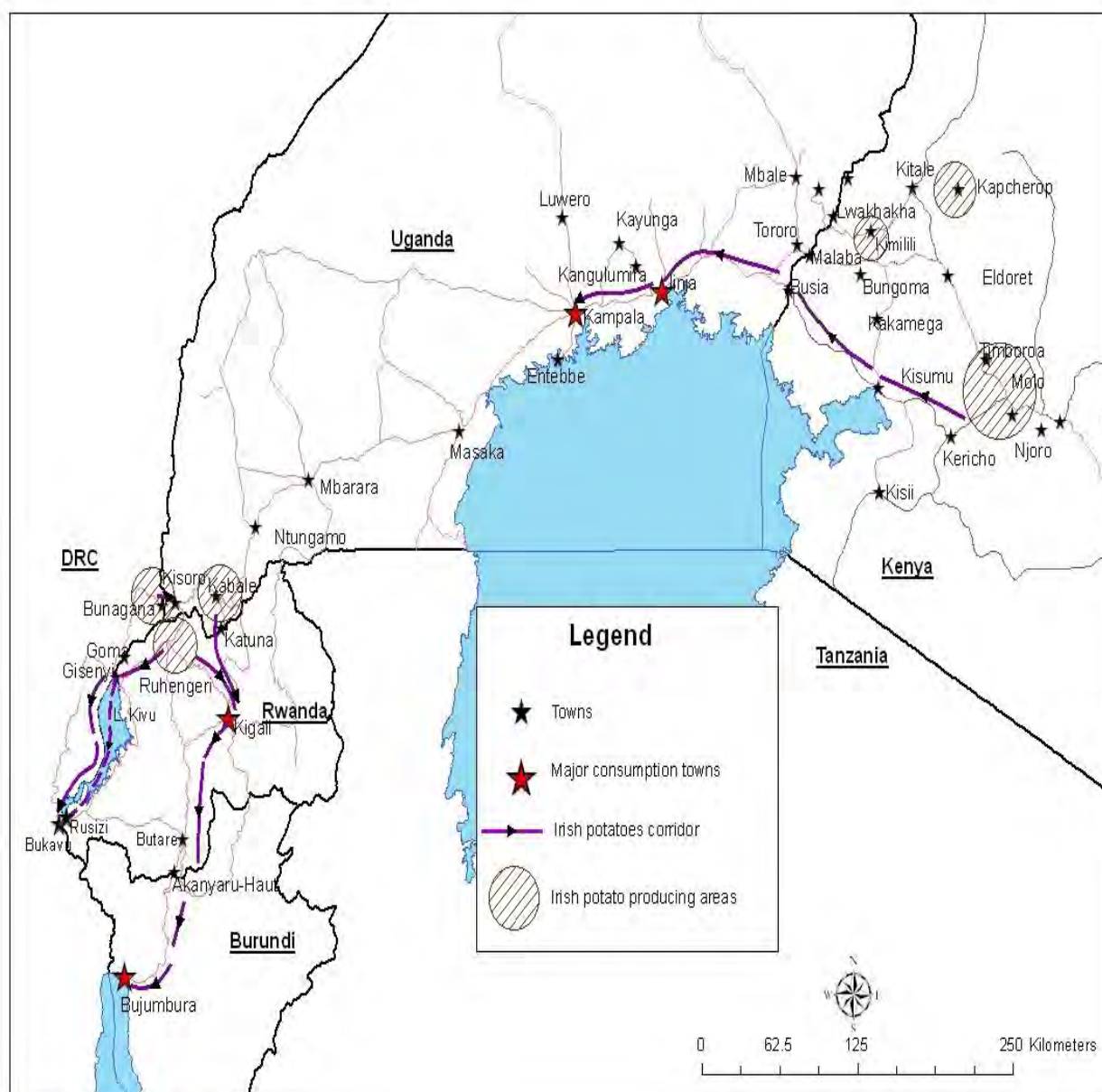
Table 5.32: Cost of transport among producers

Mode of transport	Cost per tonne per kilometre in US \$							
	Maize	Beans	Rice	Overall	Maize	Beans	Rice	Overall
Human	0.59	0.50	0.44	0.51	0.0	0.0	0.0	0.0
Animal/animal cart	0.44	0.40	0.00	0.42	0.0	0.0	0.0	0.0
Motorcycle	0.70	0.39	0.43	0.51	0.0	0.0	0.0	0.0
Bicycle	0.31	0.37	0.41	0.36	0.50	0.43	0.40	0.44
Pick up	0.0	0.0	0.0	0.0	0.32	0.33	0.39	0.35
Small truck	0.0	0.0	0.0	0.0	0.27	0.26	0.25	0.26
Big truck	0.0	0.0	0.0	0.0	0.25	0.24	0.26	0.25

5.3. Fruits and Vegetable Corridor

5.3.1 Production areas, direction and volume of trade

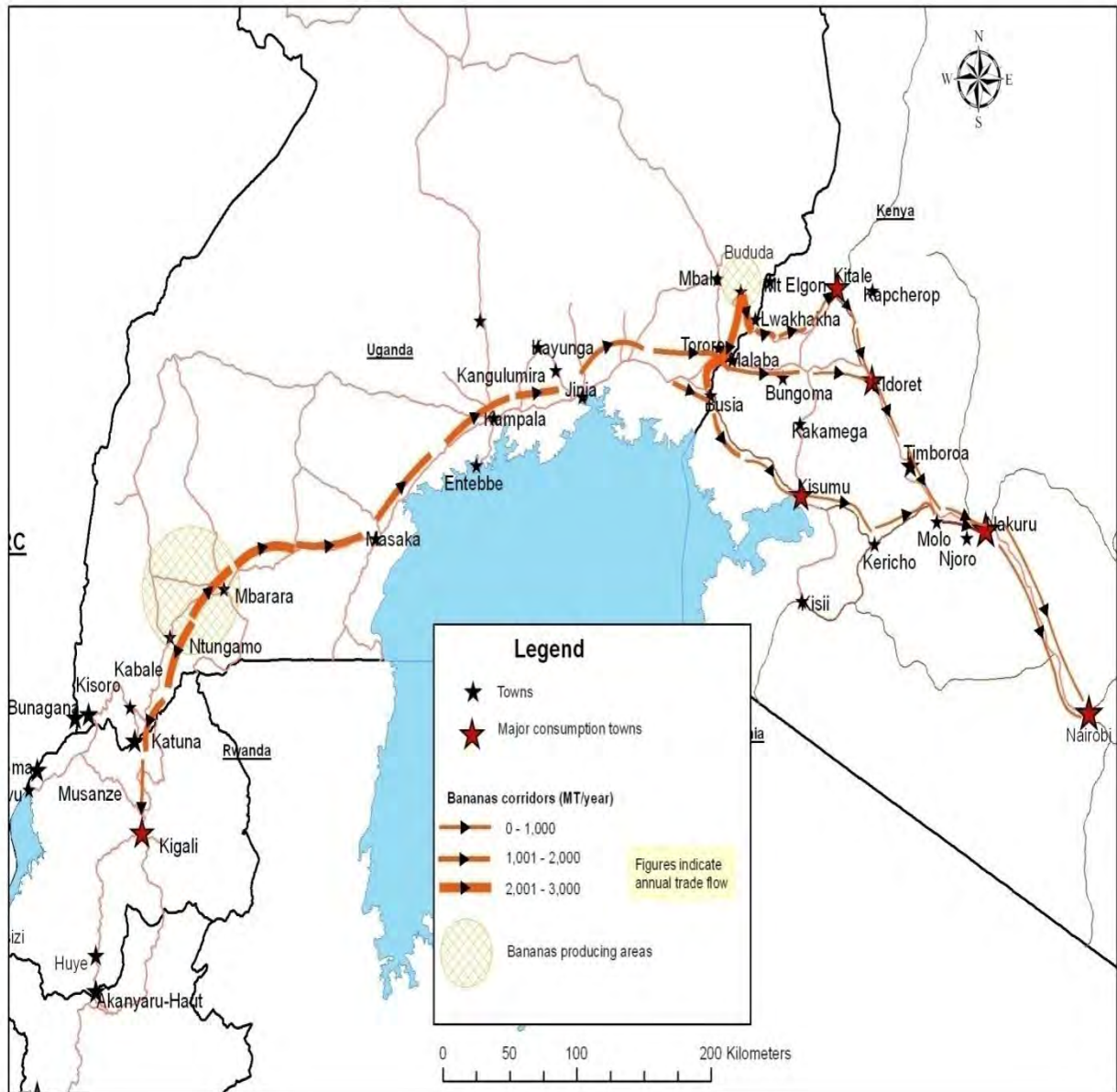
The fruits and vegetable corridor focused on passion fruit, pineapple, banana and Irish potatoes. It stretched from Burundi through Rwanda to Democratic Republic of Congo (DRC), Uganda and finally to Kenya. In Burundi, the corridor starts in Bujumbura which is a major consumer city for potatoes, mainly imported from Rwanda's Ruhengeri (Musanze) region. The Irish potatoes from Ruhengeri are also exported to the Democratic Republic of Congo (DRC) through Lake Kivu by means of boats from Gisenyi (Rubavu in Rwanda) and by road to Bukavu (DRC) from Rusizi (Rwanda). The corridor follows the main Bujumbura-Kigali road, and covers Burundi's Kayaanza region which is known for production of passion fruits. These fruits are consumed mainly in Kigali and are exported through the Akanyaru Haut border point on Burundi-Rwanda border. They are also consumed in Kampala after being transported through the border points of Kyanika and Katuna. The corridor extends to Kabale area of Uganda near the Rwanda-Uganda border (Katuna), which is a major production area of Irish potatoes that are exported to Kigali (Rwanda) during the off peak season of Irish potatoes in Ruhengeri region (Map 5.7).



Map 5.7: Irish potato production and consumption areas, and directions and flow

In the DRC, the corridor extends to a major production area of Irish potatoes that borders the DRC-Uganda border town of Bunagana. The Irish potatoes are usually exported to the nearby Uganda towns such as Kisoro. The corridor also extends to Busanza in DRC which produces passion fruits and bananas. While the bananas are just consumed across the border at Kisoro (in Uganda), the passion fruits are usually exported to Kampala.

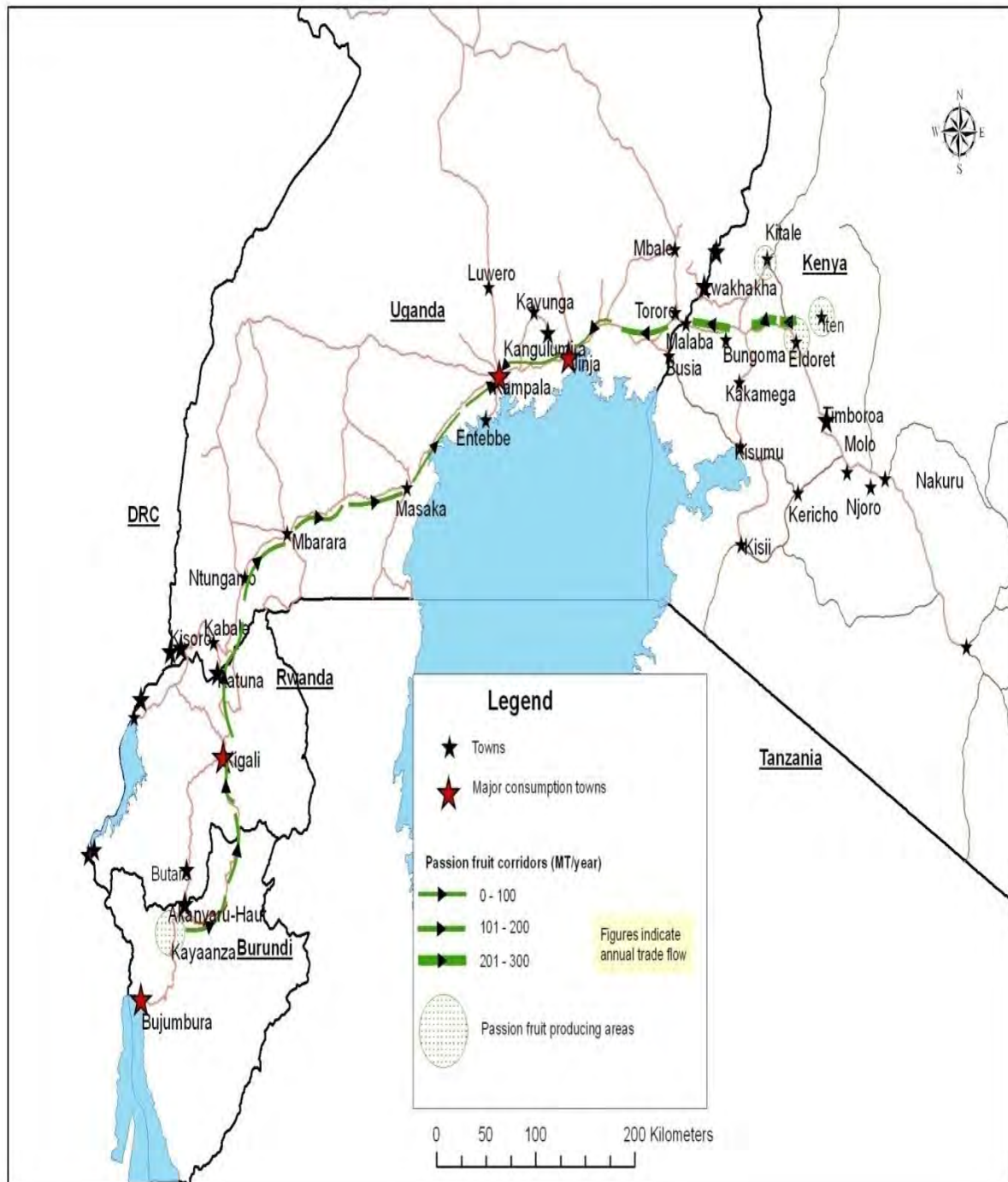
In Uganda, the corridor falls within the major banana production area of Ntungamo/Mbarara. Bananas from this region are exported to Kigali and other towns in Rwanda through Katuna border point. They are also exported to Kenya through Malaba and Busia border points to Kisumu, Eldoret, Nakuru and Nairobi. The other major Banana producing area in Uganda is Bududa (near Bushika) in eastern Uganda. Bananas from this region are exported to Kenya through Lwakhakha and Busia border points to Kitale, Eldoret, Nakuru and finally to Nairobi (Map 5.8).



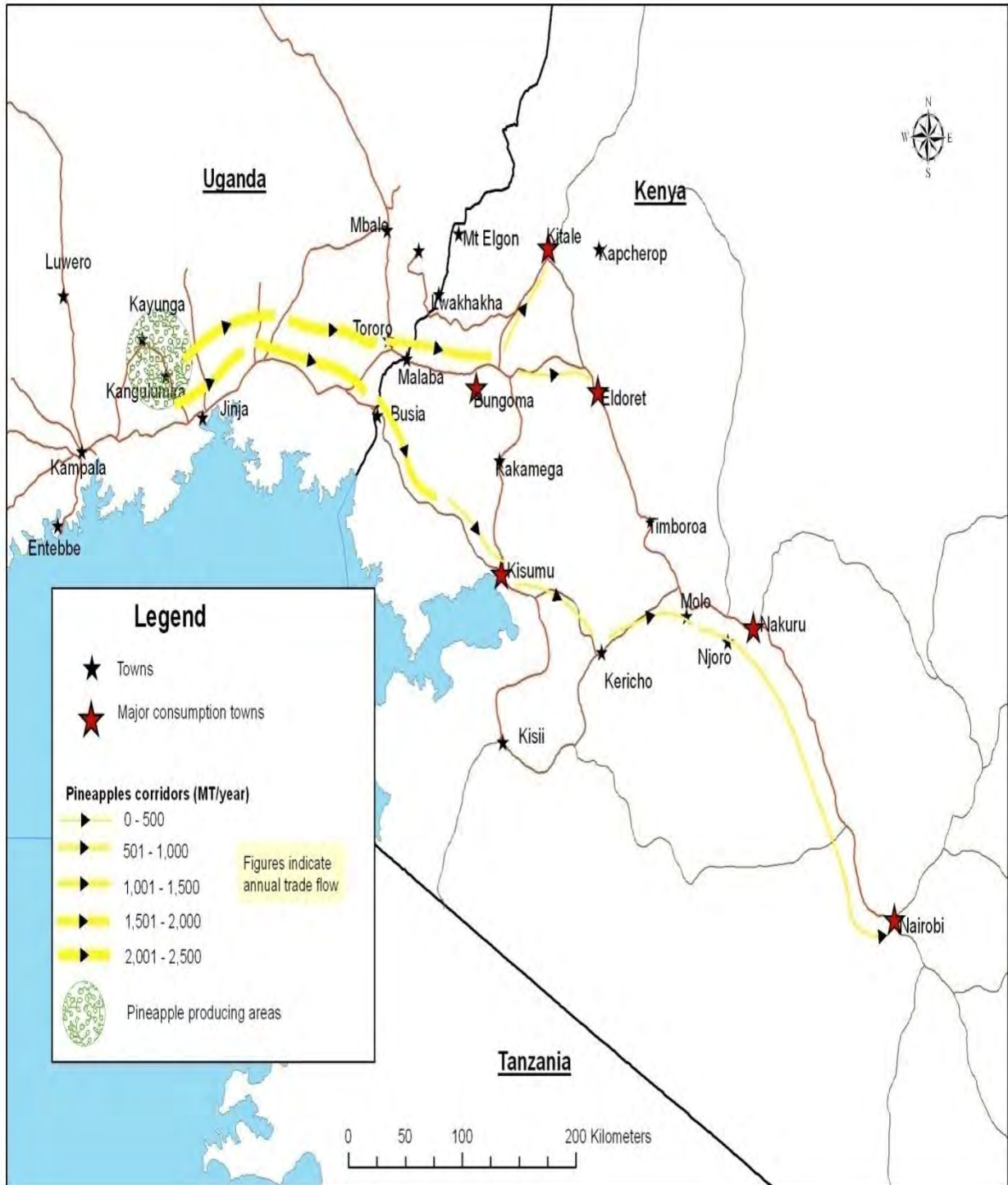
Map 5.8: Banana production and consumption areas, and directions and magnitudes of flow

In Uganda, the corridor extends further to cover Kangulumira in Kayunga District which is a leading pineapple producing area. The pineapples are exported to Kenya through Malaba and Busia border towns to consumption towns of Kisumu, Bungoma, Kitale, Eldoret, Nakuru and Nairobi (Map 5.9).

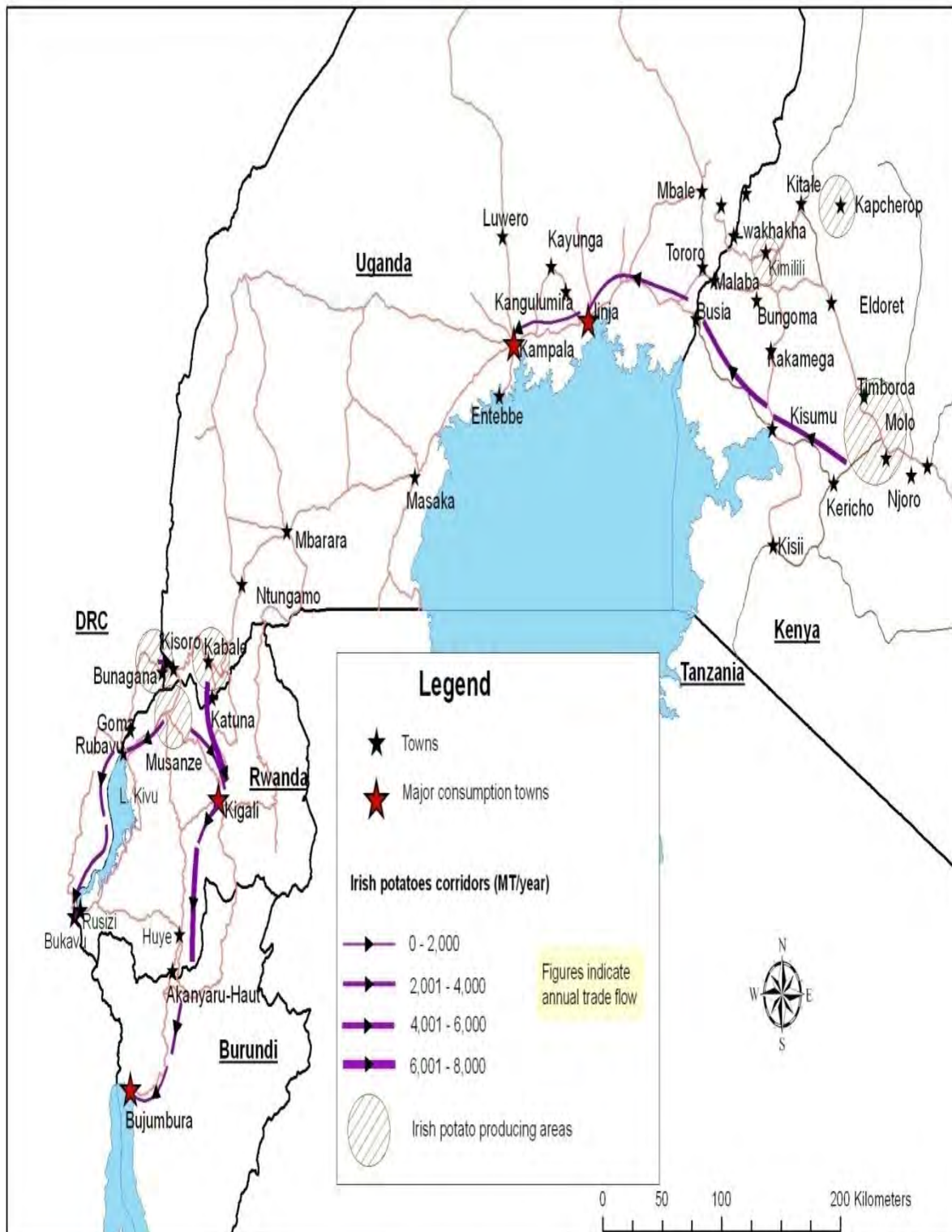
In Kenya the corridor covers major passion fruit producing areas such as Eldoret East and Keiyo North Districts. Passion fruits from this region are exported to Kampala through Malaba and Busia border points (Map 5.10). The corridor then extends to include Mt. Elgon, Marakwet East (Kapcherop in Cherangani hills), Timboroa, Molo regions which are known for production of Irish potatoes. The major consumption areas of this commodity include Jinja and Kampala towns in Uganda (Map 5.11).



Map 5.9: Passion fruit production and consumption areas, and directions and magnitudes of flow



Map 5.10: Pineapple production and consumption areas, and directions and magnitudes of flow



Map 5.11: Irish potato production and consumption areas, and directions and magnitudes of flow

IRISH POTATO SUB-CORRIDORS

5.3.2 Irish potato production and trade between Kenya and Uganda

5.3.3.1 Description of the Kenya-Uganda Irish potato sub-corridor

The Kenya-Uganda potato sub-corridor is characterised by trade flows from major production areas such as Timboroa, Molo, Mt Elgon and Marakwet East District (Figure 5.23). The potatoes flow to Uganda through Malaba and Busia border to main consumption towns in Uganda such as Kampala and Jinja.

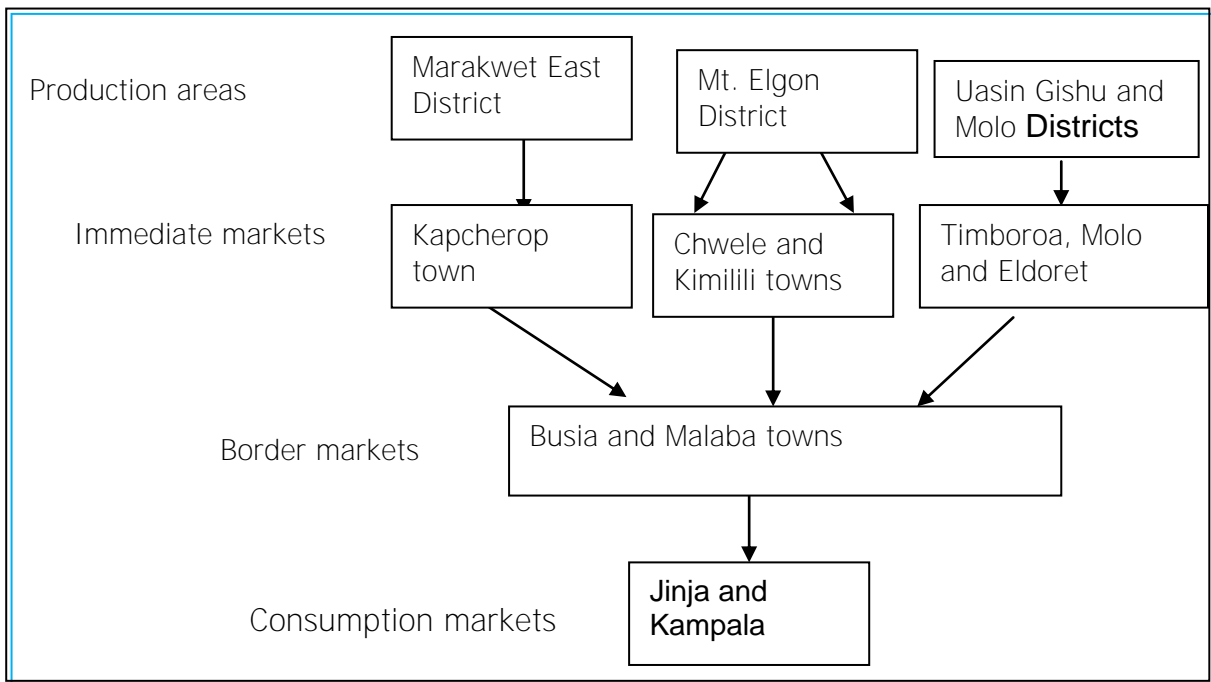


Figure 5.23: Kenya–Uganda potato sub-corridor

The average production level of Irish potatoes in Timboroa is 40 bags (of 140 kilograms) per acre. The price depends on season: during the peak season the farm gate price is US\$ 8.9/bag while during the off peak period is US\$ 39/bag.

The trend of Irish potatoes production in Mt Elgon region has been increasing since 2010. The common varieties grown in the area included: *asante*, *chips* and *alga*. The average production during the main season is 80 bags of 120 kilograms per acre while that of the minor season is 60 bags of 120 kilograms per acre. During dry periods (minor season) farmers near rivers practice irrigation by forming small dykes leading to their fields from the rivers. The farm gate prices during the main season ranges from US\$ 5.6-20 per 120 kg bag while during the minor season the range is US\$ 13.3-27.8 per bag (of 120 kg).

In Marakwet East, the commonly grown varieties are Tigoni and Black Currant. On average, a small scale farmer owns 1 acre of land, a medium scale farmer 2-3 acres and a large scale farmer 5-10 acres of Irish potatoes in a production year. The average production per acre is 45 bags per year. During the peak period a bag of 120 kilograms is sold at US\$ 7.2. The average price of 120 kilograms bag during the low season is US\$ 27.8.

In Timboroa, the main mode of transport to the immediate markets and collection centres is by use of donkeys. A donkey can carry a bag weighing about 70 kg. Those hiring donkeys pay US\$1.1 per trip.

Similarly, producers in Mt Elgon transported their produce to the immediate markets using donkeys due to the impassable dry weather roads. On average, a donkey in this region carries about 80 kilograms per trip. The charges are US\$1.1 for each trip per donkey. The buyers in Mt. Elgon have regulatory measures that have to be adopted by producers. For instance, potatoes have to be graded into 3 size categories which fetch different prices.

The main means of transport in Marakwet is also donkeys. However here they carry a full bag of 120 kilograms for every trip. The medium and large scale producers normally sell their produce to middlemen and brokers who in return sell to the consumption markets such as Kitale, Eldoret, Busia, Jinja and Kampala. The large producers often used tractors to transport their produce to the main roads from where buyers pick using canters and trucks. On average a tractor can carry 20 bags each weighing 120 kilograms.

During the dry periods when the roads are passable brokers and wholesalers in all the production areas normally buy Irish potatoes at the farm gate prices and use small and big trucks for transport to the consumption markets in the country and also across the border to Kampala in Uganda.

5.3.3.3 Gender and youth dimensions within the sub-corridor

In Timboroa, most of the producers are females aged 25-40 years, though young men normally assist with transportation of potatoes to the nearby markets. In Mt Elgon, different groups of people were involved in various production activities. Male youths of 18-30 years old did land preparation, spraying and storage because they were strong enough and had some technical knowledge of the activities. On the other hand females aged between 18-30 years old were involved in planting, weeding and harvesting because they were considered to be easy activities that do not require a lot of energy. During land preparation and harvesting, oxen handled by men were used. Older women took the produce to the market using donkeys because it was feared that men would misuse all the money in drinking alcohol. However, once the produce was sold all the money was given to the older men who would then share it among the household members. In Marakwet East, young males aged between 20-40 years formed the dominant group producing Irish potatoes, since this was their main source of livelihood in the study area.

5.3.3.4 Production and trade constraints

The major production constraints faced by producers in Timboroa included: diseases such as potato blight, lack of certified seed and well adapted varieties, expensive inputs such as seeds and fertilizers and lack of access to loans. Producers in Mt Elgon faced production problems such as: poor road infrastructure connecting the area and the immediate markets, lack of certified seeds, lack of effective control for diseases like potato blight and pests, ignorance of usage of inputs like fertilizers and chemicals, and lack of storage facilities for Irish potatoes (Photo 5.5). In Marakwet East, the major problems faced by producers included diseases such as potato blight, high prices of production inputs like fertilizers, chemicals and pesticides and inadequate extension services.



Photo 5.5: Poor storage facilities for Irish potatoes

The major trade constraints in all the production areas were low market prices for Irish potatoes and use of exploitative bags weighing 120-160 kg by traders¹³. The traders also faced price fluctuations throughout the year and poor road infrastructure (i.e. roads that were impassable during rainy seasons).

5.3.3.5 Trade characteristics at the border markets

Both formal and informal cross-border trade within this Irish potato corridor takes place at Busia and Malaba. Sofia market in Busia is the main market on the Ugandan side of the border. It has both wholesalers and retailers whereas the Kenya side has only retailers who trade from undesignated areas. On both sides of the border, the markets operate as open air markets and traders use mobile phones to reach producers or traders in the production areas. The dominant gender of traders selling Irish potatoes are adult females. During the high season, the wholesale price of a 140kg bag of Irish potatoes is Ksh 1,600, which is more than 100percent increase of the price in Marakwet and Mt Elgon production areas.

Just like in Busia, the main Irish potato market at Malaba border town is located in Uganda. The Kenya side does not have a designated area for marketing potatoes. The Irish potato trade in Malaba is characterized of very few wholesalers and many retailers. The wholesalers sell their ware from outside the market while the retailers sell from rented stores inside the market.

¹³ The farmer is offered a price for a 'bag' of potatoes and without weight standardization (e.g. at 120 kg), the farmer loses for packages higher than the standard weight

5.3.3.6 Trade characteristics of the consumption markets

The Irish potatoes exported from Kenya were mainly consumed in Kampala and Jinja. In Kampala the Irish potatoes were usually sold at Kalerwe, Nakasero and Owino markets. Kalerwe market is an open air market which has two sections for Irish potatoes, one with retailers and the other with wholesalers. Owino market is a closed market with an open air section at the gate. The market is organized much better than the one at Kalerwe and has more traders. In Jinja, the central market is the main trading area. It is an open air market characterized of middlemen, wholesalers and retailers. The dominant group trading in the market were adult females. The retail price for a 140 kg bag of Irish potatoes in this market was US\$ 18.5-24.1 during the peak season and US\$ 25.9-31.5 during the off-peak season.

5.3.4 Irish potato production and trade between Uganda and Rwanda

5.3.4.1 Description of the sub-corridors

One direction of flow of Irish potatoes is from Uganda to Rwanda during the months of April to September. During the other half of the year, Rwanda depends on her Irish potatoes from Musanze and Gisenyi Districts (located in Northern Province forming the larger Ruhengeri production area). During the months of November-January the Irish potatoes flow from Rwanda to Uganda (Figure 5.24).

The major production areas are Kabale and Kisoro Districts in south west Uganda. In this region, Muko Sub-County and Rubanda County have the highest number of Irish potato producers. The area has three production seasons: March/May, September/December and May/August, planting during the latter being done in wetlands (swamps). Production of potatoes in the Kabale region is favoured by the cool and wet climate and market demand created by increased technological advancements such as existence of a crisps and chips processing plant in the area.

In Kisoro District Irish potatoes are produced in Nyarusiza Sub-County in Bufubira County. Other crops grown in the area include cash crops and food crops such as beans, maize and bananas. The area is located at the slopes of Muhabura Mountains, which provides the wet and cool climate for production potatoes. Increasing demand for the commodity especially in Kampala and Kigali is also acting as an incentive for producers.

In Rwanda the major production areas of Irish potatoes are the Northern Province (Ruhengeri), Musanze District in Kinigi Sector. The Irish potatoes were sold in the immediate markets and also exported to Kampala through Kyanika border point.

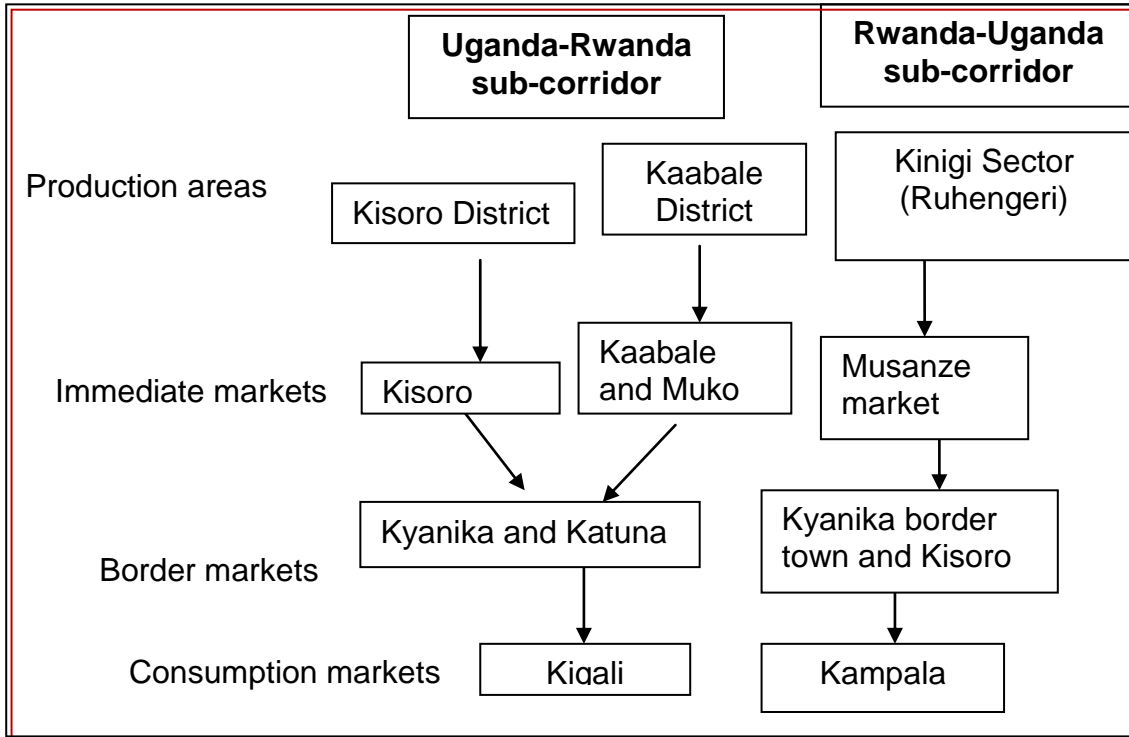


Figure 5.24: Uganda-Rwanda Potato and Rwanda-Uganda sub-corridors

5.3.4.2 Production levels, trade and main constraints

Production structure

The varieties grown in both Kabale and Kisoro include Victoria, Rwangume 12, Kinigi, Petero, Rwashaki, Nakpot 1, 2, 4 and 5, and Katchpot 1 and 2. Kinigi, which is the most common variety and the one commonly used for making chips, was allegedly smuggled from Rwanda Research Centre before it was released. The average acreage planted were under three acres and the annual average production per acre is 30 bags (of 120 kg) on fertile soils, 60 bags on virgin land and about 20 bags on poor soils and swampy areas.

In Kabale the farm gate price of a 120 kg bag during the main season (March to May and September to December) was US\$ 16.7. In Nyarusiza sub-County a 120 kg bag normally fetched US\$14.8 during the peak season but during off-peak season the price was US\$ 22.2. The prices were generally low due to flooding of local markets with Irish potatoes from other areas such as Mbale and Fort Portal.

The small producers in Kabale and Kisoro had stores at rural collection points at the main roads and they transported potatoes on their heads and bicycles. The large producers sold their produce at the farm gates to traders who came with small and big trucks of 12-25 tonnes.

Besides producing Irish potatoes, the Kinigi Sector (Ruhengeri) in Rwanda is also known for the production of maize, beans and pyrethrum. However, Irish potatoes form the major food crop as well as a cash crop of the area. The area has rich volcano soils (at the slopes of Muhabura Mountains) which support production of Irish potatoes. Value addition and other technological advancements have also enhanced Irish potatoes in the area. For instance, farmers have formed associations (e.g. Rugaga Imbaraga Association) whereby Irish potatoes are used for making starch and bread. Starch is also sold to textile industries at US\$ 4.2 per kg. Another form of value addition is the cleaning of Irish potatoes and packaging in baskets made from local fibres of bananas (weighing 5 kg) and selling them at premium prices in the local supermarkets.

The producers in Ruhengeri were also organized in cooperatives (e.g., Coabiki Cooperative Group) that help in marketing the commodity. However, the farmers produce Irish potatoes individually mainly because land is owned individually. The average production level is 20 tons per hectare during the major season and 15 tons per hectare during the minor season. On average, the farm gate price for a 100 kg¹⁴ bag of Irish potatoes is US\$15.3 and US\$18.6 for the major and minor seasons respectively.

Commodity flows from production to border markets

The consumers of the Kabale, Kisoro and Ruhengeri Irish potatoes are from both Rwanda and Uganda. There was no market at Kyanika border point due to its proximity to Kisoro town. The Rwandese use Kyanika border point to enter Uganda and travel about 7 kilometres to Kisoro. Their main mode of transport is bicycle. However, the producers use donkeys, bicycles and small trucks. The traders are not organized into any group or association in the market. The market is dominated by women traders who are either retailers or wholesalers.

The Katuna border point permits trade of Irish potatoes from the kabala area. It has an open air market dominated by adult female traders who are retailers and wholesalers. The main constraint for the traders here is lack of storage facilities. As such traders are forced to transport their wares to Kabale wherever there is a market day in Katuna.

Main constraints

Irish potato producers in all the three areas are faced by constraints such as diseases like potato blight, bacterial wilt and fusarium, lack of production inputs like knapsack sprayers, soil erosion in their farms due to the hilly topography of the area, inadequate rainfall during dry seasons and lack of clean and selected planting materials. The major trade problems experienced in the area were poor market prices and poor road infrastructure and lack of organization of farmers into marketing groups or associations that would bargain for better commodity prices.

Gender and youth dimensions

The dominant group involved in the production of Irish potatoes in Kabale, Kisoro and Ruhengeri comprises males aged 18-40 years as women were mainly involved in household chores. Females aged 18-40 years were usually hired to do land preparation because they were more organized than their male counterparts. On the other hand, men aged 18-40 years are mainly involved in spraying, storage, transporting and marketing because they were more energetic. The potatoes are taken to the markets mostly by women. The intermediate markets too are dominated by female traders.

5.3.5. Irish potato production and trade between Rwanda and Burundi

5.3.5.1 Description of the Rwanda–Burundi Irish potato sub-corridor

Irish potatoes in this sub-corridor flow from Rwanda's major production area of Ruhengeri through Akanyaru Haut border point to Kayanza and Bujumbura consumption markets (Figure 5.25). The corridor has similar production and trade characteristics as the Rwanda-Uganda potato corridor, with the exception of cross-border consumption markets whose attributes are discussed in this section.

¹⁴ Unlike other countries in the corridor, Rwanda has standardized the potato bag weight to 100 kg

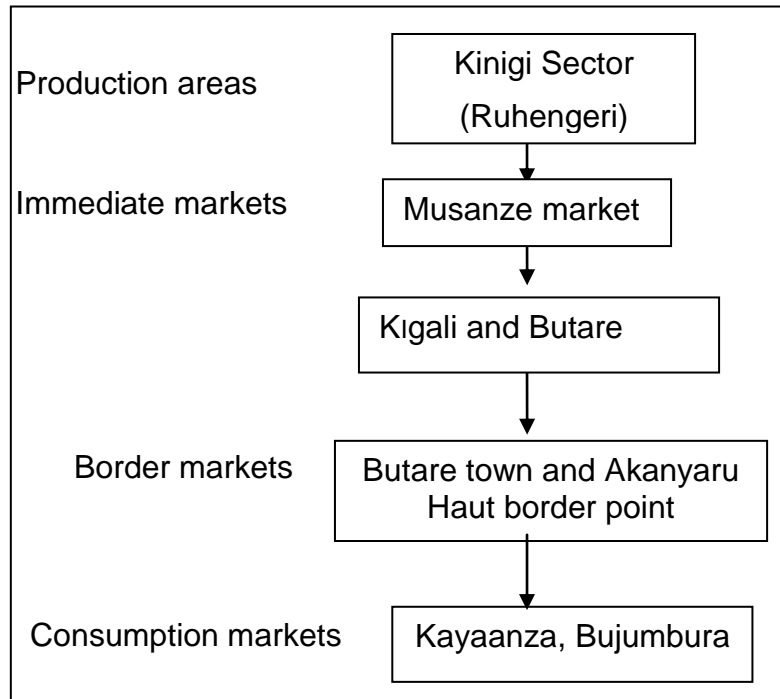


Figure 5.25: Rwanda-Burudi Potato sub-corridor

5.3.5.2 Trade characteristics at the consumption markets in Bujumbura

The Kayaanza Irish potato market in Burundi has both wholesale and retail traders. The wholesale and retail markets are open air markets. It was noticed that there is a lot of rotting of Irish potatoes in the market due to lack of storage facilities especially during the rainy seasons. The Bujumbura Irish potato markets have also retail and wholesale sections. The main market in the city is Mvile, a closed market for retailers and wholesalers. The dominant group of traders in this market is adult women. The wholesalers normally sell from outside the market whereas the retailers do their business from inside. The other Irish potato market in the city was Kamenge. This is an open air market dominated by adult women traders who are retailers as well as wholesalers.

5.3.6 Irish potato production and trade between DRC and Uganda

This is the shortest cross-border trade corridor of Irish potatoes in the region. The flow of the commodity is from Bunagana in DRC to Kisoro in Uganda (Figure 5.26). This corridor is particularly important when there is a shortage of Irish potatoes from the Nyarusiza sub-county in Uganda. Due to the favourable climate and rich soils, production in DRC takes place throughout the year. However the main seasons fall in the months of November-January and May -September. During this period a bag of Irish potatoes weighing 130kgs is normally sold at US\$ 5.5. The minor season falls in the months of February -April and a 130kg bag sells at US\$ 8.2. The dominant group producing the commodity is males, aged between 20 and 45 years. However the immediate and border markets at Bunagana are dominated by female traders.

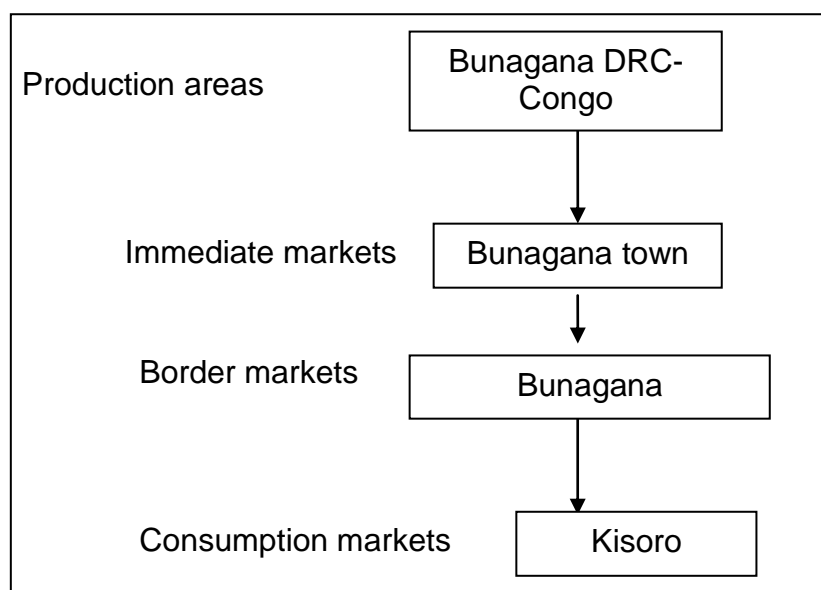


Figure 5.26: DRC-Uganda Potato sub-corridor

The major problems faced during production of the Irish potatoes in the area include: poor roads, destruction of Irish potatoes by wild animals, poor market prices, lack of inputs and poor drainage causing floods during the rainy seasons. In addition, producers never receive any extension services because it is very expensive for them. The main mode of transport used by farmers in this corridor is a wooden bicycle called *chikuddu* that carries at most 2 bags of Irish potatoes per trip. Producers mainly use this mode of transport to transport potatoes from the production area in Bunagana to the border point in Uganda. From the Bunagana border point traders normally use a vehicles, motorcycles or bicycles to transport the commodity to Kisoro.

BANANA SUB-CORRIDORS

5.3.7 Banana production and trade (Uganda/Kenya and Uganda/Rwanda)

5.3.7.1: Production and trade patterns in the sub-corridor

The movement of bananas from Uganda to Kenya was mainly through Busia, Malaba and Lwakhakha border points to western Kenya towns and Nairobi. There was also movement of the commodity from Uganda to Rwanda through Katuna but rarely from Rwanda to Uganda. A unique direction of flow was noted in western Uganda where bananas from DRC Congo flow to Uganda's western town of Kisoro through Busaaza and Bunganama border points (Figure 5.27). At times, Kenyan cooking bananas are exported to Uganda but this was not evident during the time of this survey.

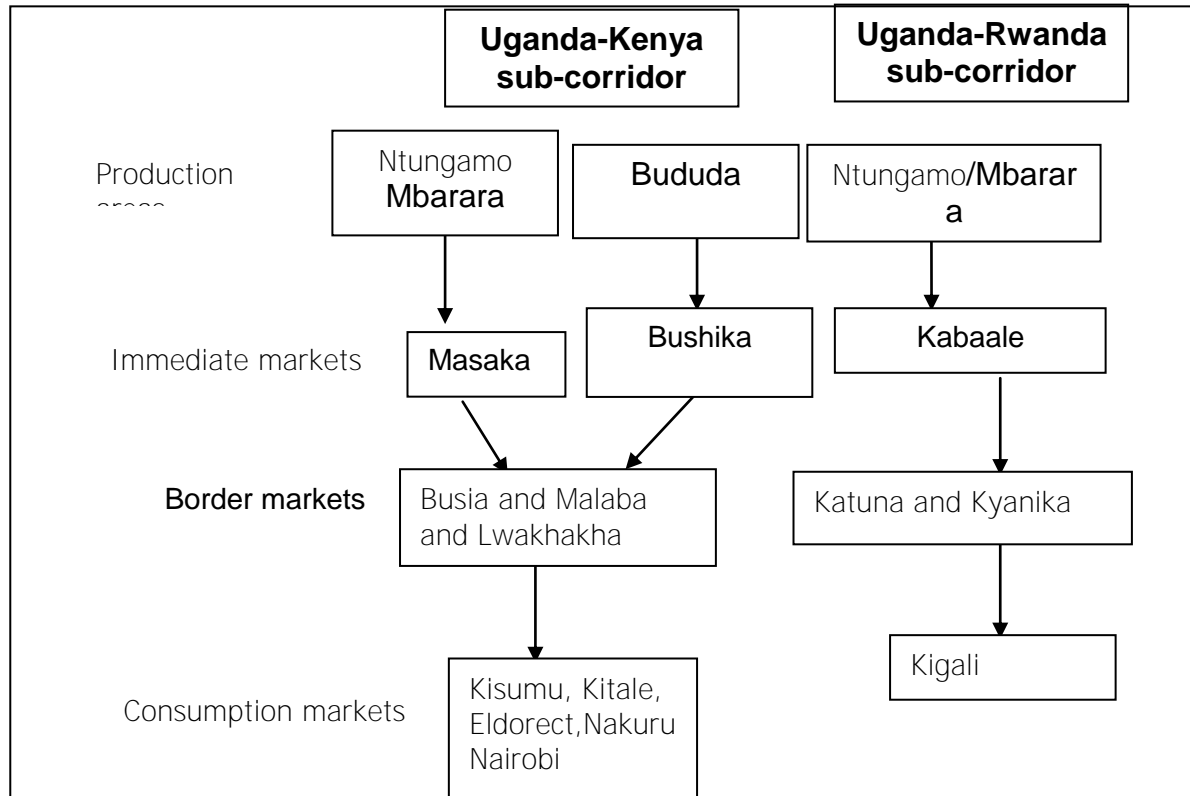


Figure 5.27: Banana sub-corridors

There are two major banana producing areas in Uganda: Mbale (Bududa) and Ntungamo/ Mbarara regions. In Bududa banana is the main cash crop as well as being a food crop. The other main crops grown in this region are cassava, beans, coffee, fruits and vegetables. The area lies on the slopes and ridges of Mt Elgon and experiences cool and wet climate that favours banana production. Also the historical cultural background favors banana production as the people of this area have been growing the crop for a long time.

Ntungamo is known to produce a lot of bananas (both ripe and matoke) with surpluses that are sold in the local markets and also exported to Kenya, Rwanda and South Sudan. The area also produces food crops like beans, millet, maize, pineapples, groundnuts, sweet potatoes and cassava. It also produces coffee and milk from dairy cattle and the long-horned Ankole cows. Most banana farmers are in well organised and properly managed marketing groups with savings and credit schemes (e.g. Kigarama farmers group). This enables them to conduct their farming business well and makes it easier for extension agents/messages to reach them.

Farmers in both production areas are mostly small scale and there were no distinct gender patterns in the division of roles both at production and marketing levels. Produce is either taken to nearby markets or sold to brokers at the farm gates. On average, the farm level price for an average bunch of bananas in Bududa is US\$ 4 although this depends on the season. In peak seasons a bunch costs US\$ 3.3-4.4, but it is within the range of US\$5.6 - US\$7.4 during off-seasons. Price volatility is also influenced by banana supply from other areas.

The price of an average bunch in Ntungamo during the peak season is between US\$ 0.7 and US\$1.1. This price ranges between US\$ 2.6 and US\$ 3.7 during the minor season. The relatively low prices explain why bananas from this region are traded in distant locations like Nairobi despite such consumption areas having nearby sources for the commodity.

5.3.7.2 Trade characteristics at the consumption markets of the sub-corridors

The bananas from Mbale (Bududa) and Ntungamo are exported through Katuna, Busia, Malaba or Lwakhakha and consumed in Kigali and Kenyan towns such as Kisumu, Kitale, Eldoret, Nakuru and Nairobi. Wholesalers use lorries as the main means of transport to these markets. One unique thing about closed markets in these towns is that they mainly sell in terms of weight (kg) as opposed to bunches or 'fingers' in the open markets. The price depends on the seasons and therefore varies throughout the year. During the peak seasons (December to March/June to August) a kg in Kenyan markets sold for about US\$ 0.3-0.4 while in other months one kg was sold for about US\$ 0.4-0.6. In Rwanda (mainly Kigali's Kimironko market), the average price for a bunch¹⁵ was US\$ 8.5–10.2 and may rise to US\$ 9.1–13.6 during off-season. Male and female youths (men and women) normally dominate trading in these markets.

5.3.7.3 Constraints encountered by producers and traders

The production and trade constraints that producers face are:

- Diseases (especially bacterial banana wilt)
- Lack of market and storage facilities (Photo 5.6)
- Poor road network
- Exploitation by brokers
- Soil degradation and land fragmentation
- Poor access and availability of extension services on new technologies

Just like all other commodity markets in the region, most of the banana consumption markets lack proper storage facilities, proper waste disposal and managements, and orderliness in handling and packaging of commodities. Other major constraints that traders face in these markets include: lack well built markets with proper roofing to allow business activities to take place even when it is raining; high transport costs and high charges at weigh bridges, customs and 'facilitation' fees; poor road network that are not passable during rainy seasons.

¹⁵ An average bunch weighs about 15 kilograms



Photo 5.6: Lack of market and storage facilities for bananas

PASSION FRUITS SUB-CORRIDORS

5.3.8 Passion fruits production and trade

5.3.8.1: Description of the sub-corridors

As shown in Figure 5.28, there are two directions of flow of cross-border trade of passion fruits: one, from Burundi to Uganda and the other from Kenya to Uganda. The major production area of passion fruits in Burundi is Matongo commune in Kayanza Province. The major consumption area is Kampala city though some end up being consumed in Kigali.

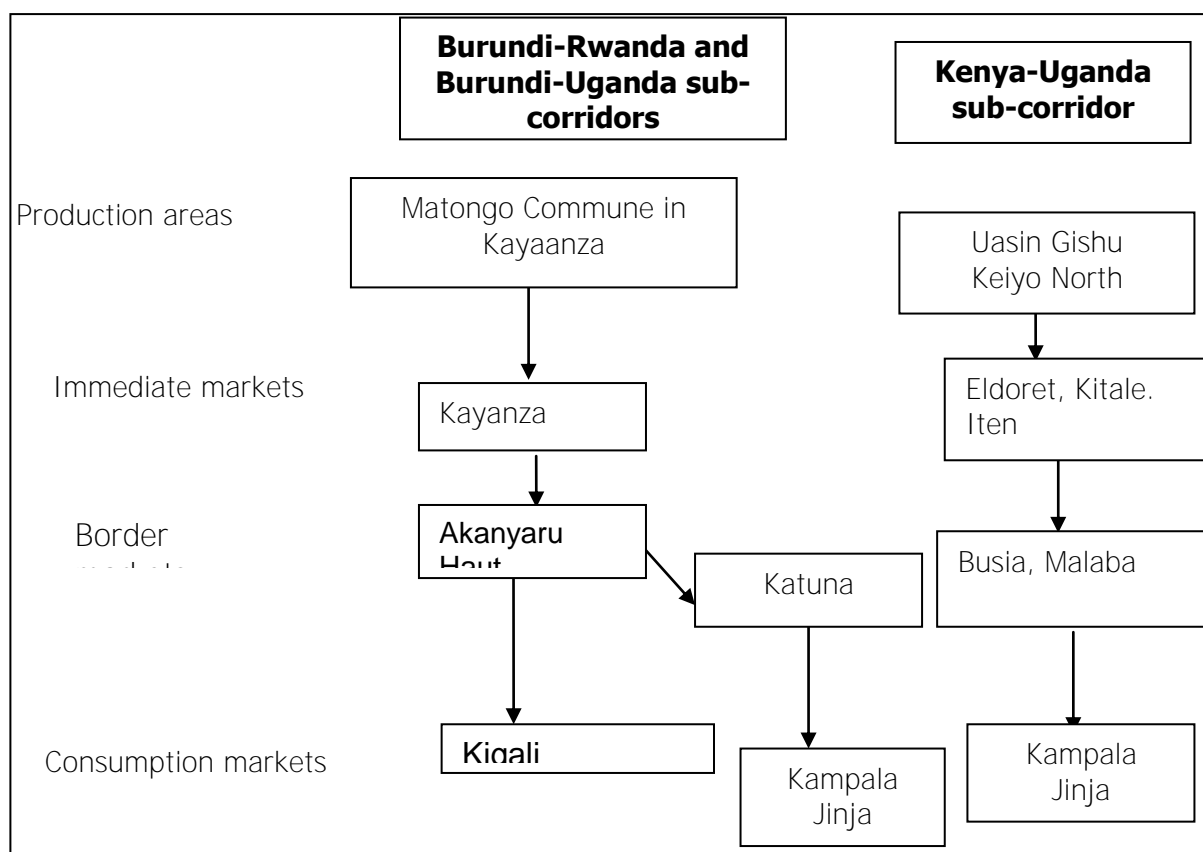


Figure 5.28: Passion fruits sub-corridors

The main production areas of the passion fruits in Kenya are Uasin Gishu and Keiyo counties in the Kenyan rift valley. The peak production season is April-December (during the rainy season) while the low production season is January-March during the dry period.

The Matongo commune in Kayanza Province is one of the 17 provinces of Burundi. It is located in the northern part of Burundi, 93 kilometres from Bujumbura. It has an altitude of 1900- 2000 metres above sea level with an average annual rainfall of 1463 mm. The producers of passion fruits in Matongo have low resource endowments and the majority of the population are poor with low levels of education.

5.3.8.2 Production levels and trade characteristics

During the good production levels in January-June the prices of passion fruits at the farm gate are as low as US\$ 0.08 compared to the low seasons when they are as high as US\$ 0.8. The producers sell their passion fruits to local processors (who prepare juices-Maracoudja) and brokers who take the fruits to Kigali and Kampala. The intermediate markets are Kayanza and Butare (in Rwanda). The producer market in Kayanza has very little passion fruit activity as most of the fruits are sold to processors and middlemen at the farm gates.

In Kenya, the main growing areas for passion fruits exported to Uganda are Keiyo and Uasin Gishu Counties in the highlands in the northern parts of Rift Valley Province. There is also some production in Bungoma, Kitale, and Nandi Hills. The altitude in these areas ranges between 1500m to 2700m above sea level and the annual rainfall is between 900mm to 1200mm. Most of the producers are well endowed with resources since they live in some of the most productive areas in Kenya in terms of

agriculture. Most of the producers engage in diverse income generating activities such as crop and animal production.

Most of the passion fruits from Kenya are sold at the farm gate but in some areas such as Bugar in Iten producers have set up collection centres where they converge to wait for traders coming from as far as Kampala. The prices vary from as low as US\$ 0.2 per kilogram during peak season to as high as US\$ 1.0 per kilogram during the low (dry) season. When the temperatures in the consumption areas (such as Uganda) increase there is a tendency of the prices to go up due to increased demand.

Passion fruit production in Kayanza is dominated by men aged 19-45 years. Men also dominate the brokerage business along the corridor. Women dominate the retailing business of passion fruits in both border points of Rwanda-Burundi and Kenya-Uganda. The brokers operating in the consumption markets are mainly men while the majority of the retailers are women.

5.3.8.3 Constraints and potential opportunities for producers and traders

The major production constraints in Kayanza include lack of clean seed, poor road infrastructure in the production areas, passion fruit diseases, and low producer or farm gate prices. Moreover, production of passion fruits is rain-fed and therefore vulnerable to vagaries of the weather. Some of the major trade constraints faced in the immediate and consumption markets include: insecurity in the market and especially at night, lack of selling space in the markets, poor waste disposal, lack of electricity, lack of storage facilities and pests such as rodents. In Burundi some of the opportunities for passion fruit producers and traders include source of income to farmers and source of employment to the local people.

In Kenya the production constraints include: diseases, lack of water during the dry season, lack of quality planting materials which are disease free, poor road network during the rainy season leading to high transportation costs, and low prices from the brokers. Some of the production opportunities include source of income and employment, and spreading of risk as producers do not depend on one activity or commodity. The major trade constraints in the cross-border markets are lack of selling space, lack of shelters during rainy seasons, poor sanitation and unhygienic conditions.

5.3.8.4 Trade characteristics at the cross-border markets

From Kayanza the passion fruits from Burundi go through the Akanyaru border point. However this border point does not have a market and most of the trading takes in Butare (Huye) market which is about 7km for the border point. The passion fruits in this market are normally retailed in kilograms. The prices vary with the seasonality of the fruits. During the main season, the buying price for a kilogram of passion fruits is in the range of US\$ 0.5-0.6 while the selling price averages about US\$0.8. During the minor season the retailers buy a kilogram of passion fruits for US\$1.0 and sell the same for US\$1.4. As expected, prices appreciate during the low production levels and decline during the high production levels due to increased supply.

In Kenya, the cross-border markets for passion fruits are Busia (Uganda with the main market) and Malaba. The retailers get their supply from brokers who get them from producer areas such as Eldoret, Kitale, and Keiyo. In these cross-border markets retailers buy the passion fruits in bags of 85 kg and sell them by counting a number of fruits for a given amount of money. The buying prices for passion fruits in the main season vary from US\$0.4-0.6 per kg while the selling prices range from US\$0.7-0.9 per kg. During the minor season, the buying prices are in the range US\$0.7-0.9 per kg while the selling prices are in the range of US\$1.1-1.3 per kilogram. The retailers do not have storage facilities and just leave their wares in the market stalls or in the open air.

The cross-border consumer markets for passion fruits from Burundi are Kigali and Kampala (Owino and Kalerwe are the key markets). In Uganda, the fruits are brought to the markets by brokers who in turn sell them to wholesalers and retailers. The passion fruits are sold in kilograms. In Uganda Owino is the main market or landing point of passion fruits from Burundi, where traders from other markets get their supply. The fruits are delivered by big trucks in bags of varying sizes. In Kampala the bags of passion fruits from Burundi weigh about 60kgs while those from Kenya weigh 85kgs.

In Kampala markets, the buying prices of passion fruits range from US\$ 1.2-1.3 while the selling price ranges from US\$0.4-0.45 per kilogram during the major season. For the minor season the buying prices are US\$1.1 while the selling prices range between US\$1.2 and US\$ 1.5 per kilogram. The variation in prices in consumption markets in Kigali is high as opposed to Kampala. This is attributed to the fact that in Kigali the supply of passion fruits is from one source while for Kampala the supply is from different sources such as Kenya, Uganda and Burundi.

Informal cross-border trade creates a host of employment opportunities on both sides of the countries that border one another. First, the producers get a market for their commodities earning them the much needed income used to cater for their daily needs. Cross-border trade also provides employment to various actors, such as brokers, retailers, eateries and transporters who are involved in the value chain.

5.3.8.5 Potential for use of water in the passion fruit sub-corridor

It was observed that rivers passing through the production areas of passion fruits in both countries drain into Lake Victoria which is the source of the Nile. One of the rivers that passes through the production area in Kenya is River Chepkoilel which joins River Nzoia before draining into Lake Victoria. Most of the passion fruit production is rain-fed but some farmers use irrigation, relying on water from the rivers. This ensures a steady supply of fruits and also spurs cross-border trade. However, for producers to exploit the irrigation potential and increase passion fruit productivity, efforts must be made to provide the following facilities, either through the initiatives of the producers themselves or through joint partnerships with government agencies:

- Storage facilities to reduce post-harvest losses
- Development of irrigation infrastructure
- Provision of infrastructure, credit facilities and training on agro-processing and value addition techniques as well as improving linkages with up-stream processors and retail outlets/exporters
- Reducing cross-border trade barriers that hinder growth of trade between the countries

PINEAPPLE SUB-CORRIDOR

5.3.9 Pineapple production and trade

5.3.9.1: Description of the sub-corridor

Pineapple is produced in Uganda and Kenya but only Ugandan pineapple is exported to Kenya (Figure 5.29). Pineapple from Kenya is consumed locally and the rest processed, packaged and sold to international markets by large scale producers like Delmonte Kenya and Kakuzi Kenya who are the leading large scale producers of pineapple within East Africa. Small scale producers in Kenya sell the commodity within the country.

The leading exporter of small scale pineapples among the Nile Basin riparian states is Uganda. The country has pineapple supply throughout the year due to diverse climatic conditions in the production areas. The main producing area is Kangulumira, in Kayunga District whose produce is consumed locally and also sold to the neighboring countries and Europe. In Kangulumira sub-County, pineapple is the main cash crop with other crops like cabbage, maize, carrots, kales and plums being grown for subsistence. Previously, the main cash crop was coffee until it was attacked by coffee wilt disease about a decade ago, forcing farmers to shift to pineapple farming.

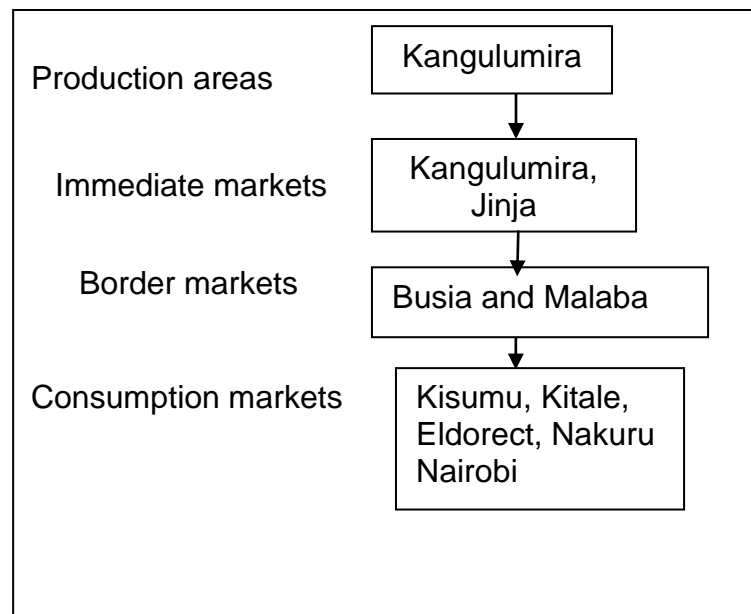


Figure 5.29: Pineapple sub-corridor

Pineapples in Kangulumira take 18-24 months to mature depending on the method of propagation and the smallest pineapple farmer owns about 0.25 acres with the largest owning 5 acres. The crop yield is about 60 tonnes per hectare in the high season while the ratoon crop (low season) yield is about 40 tonnes per hectare. There are no farmer groups in the area and poverty levels are high. Pineapple production is dominated by male youths aged 25 years and above. However, both adult males and females engage in trading.

The major production constraints experienced by the producers are pests such as milly bugs, lack of certified planting materials, expensive inputs such fertilizers and pesticides and high transport costs, and lack credit facilities. The major constraints being experienced by traders are low selling prices, poor roads and poor storage facilities.

5.3.9.2 Trade characteristics at the immediate and cross-border markets

The trade in pineapples produced in Kangulumira has been increasing since 2008 due to Uganda government's commitment to assist farmers to increase their production. The immediate market for pineapples is located in Kangulumira township/market centre. Here there is an open air market which enables producers to deliver their produce to middlemen, wholesalers and retailers. During the low season, the pineapple sells at very high prices (US\$ 0.3-0.4 per piece) and some farmers delay harvesting their crops so as to gain high returns during this period. During the high production season, the price range is US\$ 0.1-0.2 per piece. The traders get market information from the brokers, wholesalers, friends and other farmers.

The commodity is also traded in Kampala and Jinja where the price of one pineapple averages between US\$ 0.4 and US\$0.9 during the peak season and between US\$0.6 and US\$1.3 during the low season.

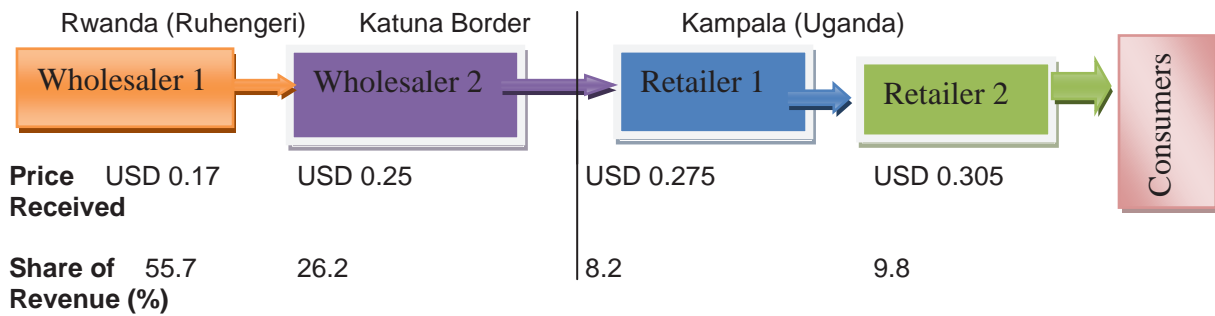
The Busia area had three major markets, with two of them (Sofia and Busia main markets on the Ugandan side) being involved in pineapple trade; at the time of the survey, there were about 20 traders at Sofia market and 40 at the Busia main market. The markets have both wholesalers and retailers, and trade takes place in the open air. The wholesale price of an average pineapple is US\$0.4 during the months of October and December and also January and March. During the months of April and September the price ranges between US\$ 0.45 and US\$ 0.6.

The Malaba border town has a major market on the Ugandan side which has both wholesalers and retailers. The market has similar characteristics as Busia markets including the prices.

Trade in pineapple, whether formal or informal, has provided employment to many youths in the production and consumption countries. It is a reliable source of income to farmers, drivers, loaders and off-loaders. Trade in the commodity also supports livelihoods of brokers and traders who in turn employ other workers and agents. The pineapple markets are also linked to small-scale juice processors along the corridor and thus not only create employment opportunities for the youth and women but also help to improve food and nutritional security in the corridor.

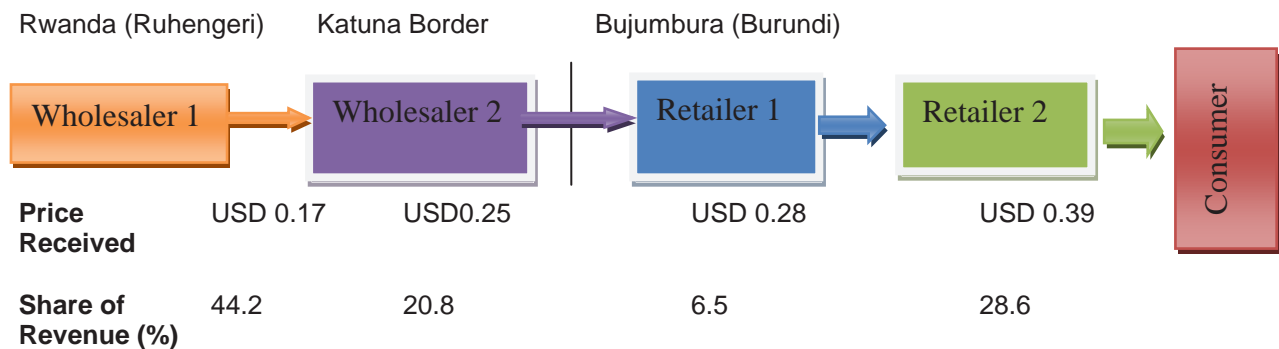
5.3.10 Commodity values along the corridors

5.3.10.1 Price and revenue distribution along the Rwanda-Uganda Transboundary Irish potato trade corridor

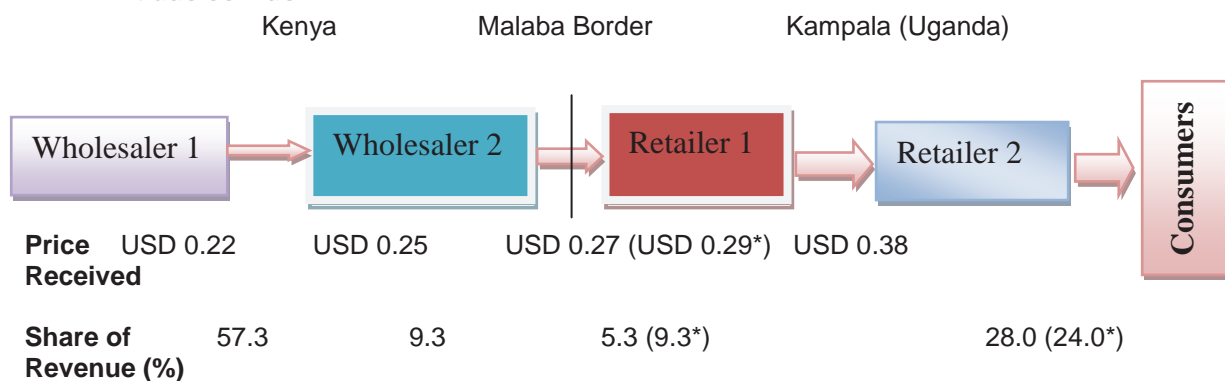


Wholesaler 1 buys from the producers. Wholesaler 2 sells at the intermediate market. Retailer 1 sells at the border point while retailer 2 sells at the consumption point in the importing country. The prices are averages of the on- and off-season prices.

5.3.10.2 Price and revenue distribution along the Rwanda-Burundi Transboundary Irish potato trade corridor



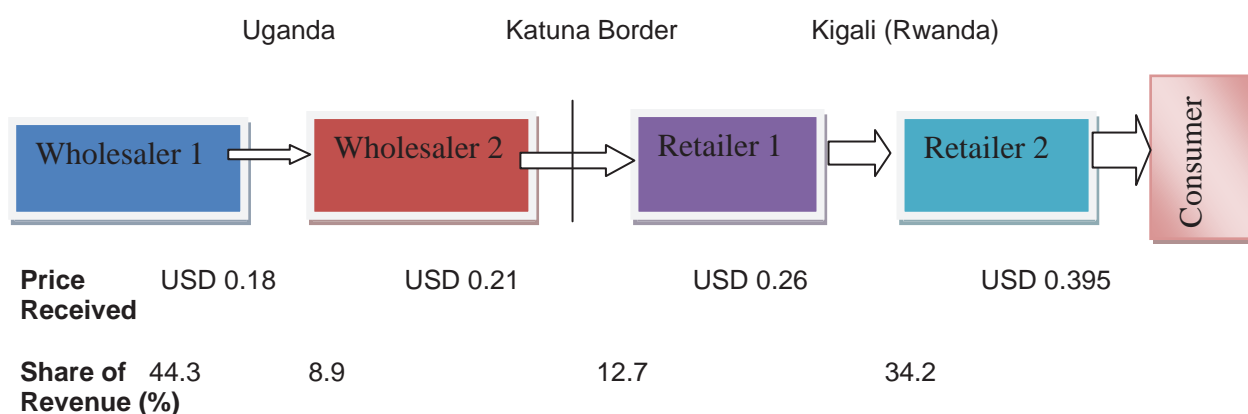
5.3.10.3 Price and revenue distribution along the Kenya-Uganda Transboundary Irish potato trade corridor



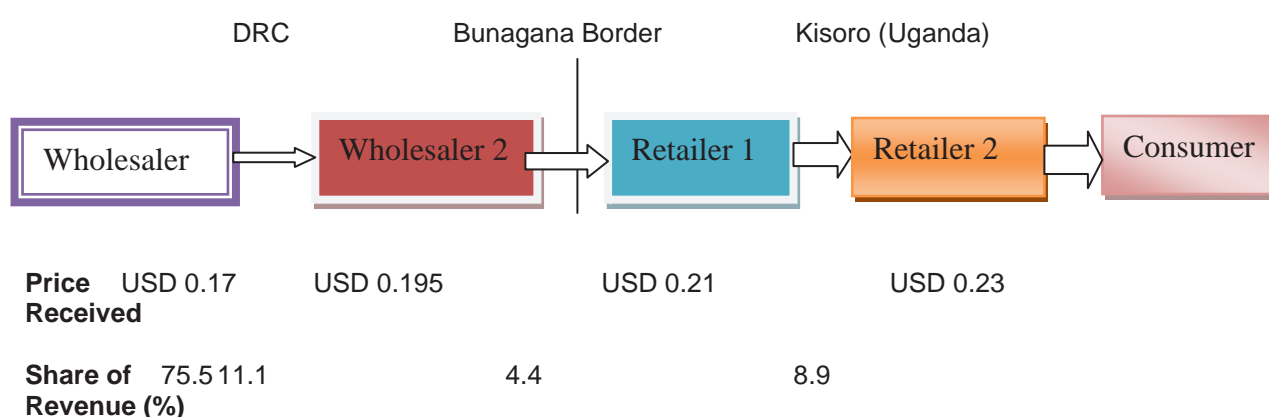
*Represents trade across Busia border point.

While retailer 1 enjoys a higher share of revenue through Busia border, the share of retailer 2 is lower through the same border point. This implies retailers in Kampala would rather have their Irish potato from Kenya go through the Malaba border point.

5.3.10.4 Price and revenue distribution along the Uganda-Rwanda Transboundary Irish potato trade corridor

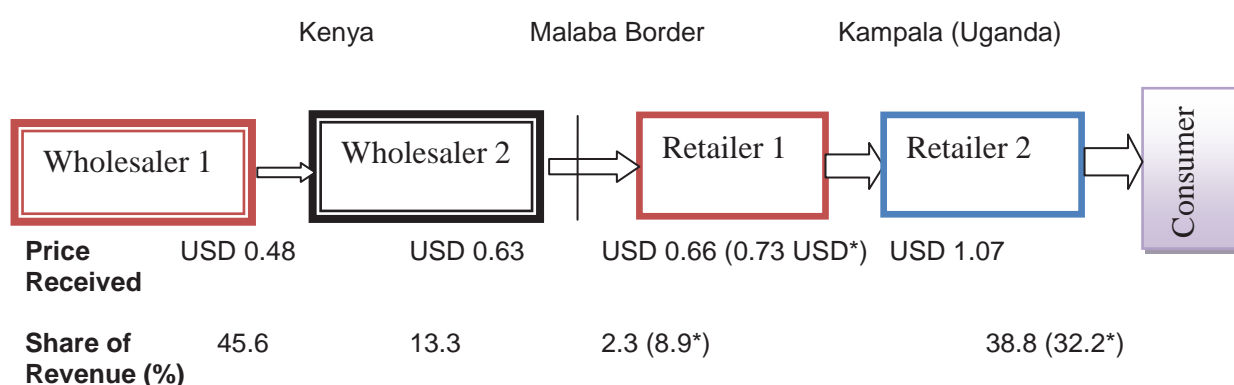


5.3.10.5 Price and revenue distribution along the DRC-Uganda Transboundary Irish potato trade corridor



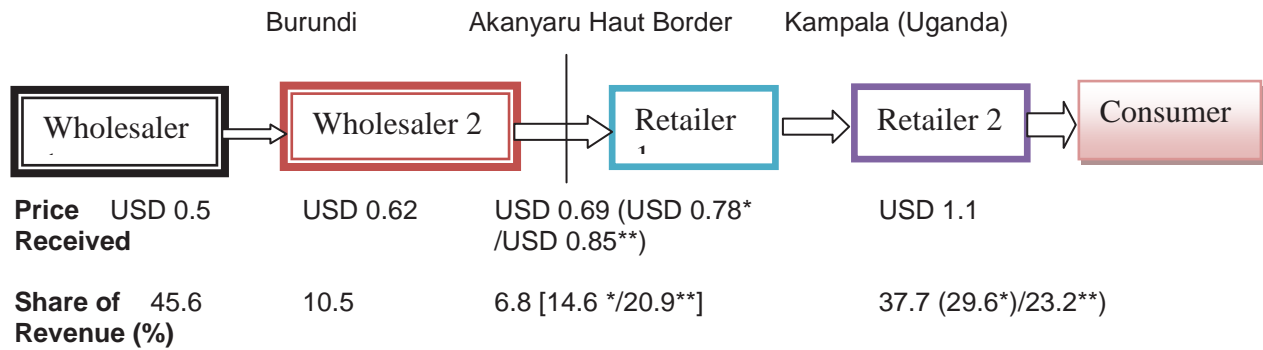
Overall, trans-boundary trade in Irish potatoes is more lucrative for retailers in Kampala, across Rwanda-Uganda border where their share of revenue is highest (34.18percent).

5.3.10.6 Price and revenue distribution along the Kenya-Uganda Transboundary passion fruit trade corridor



* Represents fruits that go through Busia border point to Kampala, whose share of revenue for final retailer is low compared with those that pass through Malaba

5.3.10.7 Price and revenue distribution along the Burundi-Uganda Transboundary passion fruit trade corridor

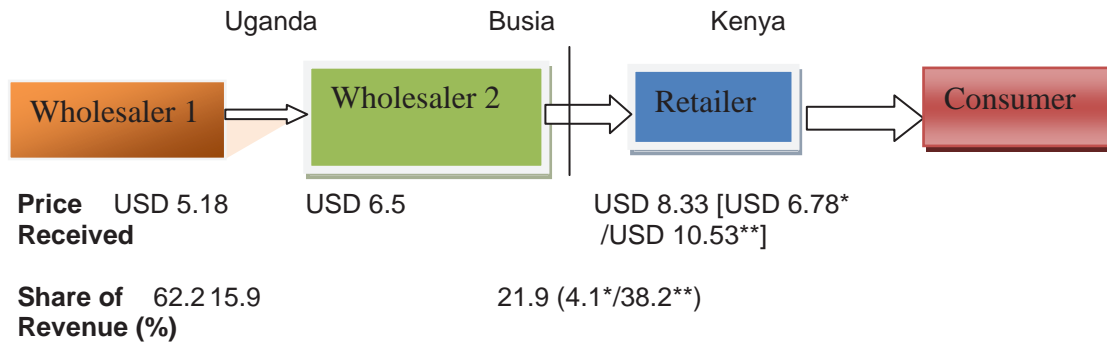


Notes:

* Fruits that go through Butare

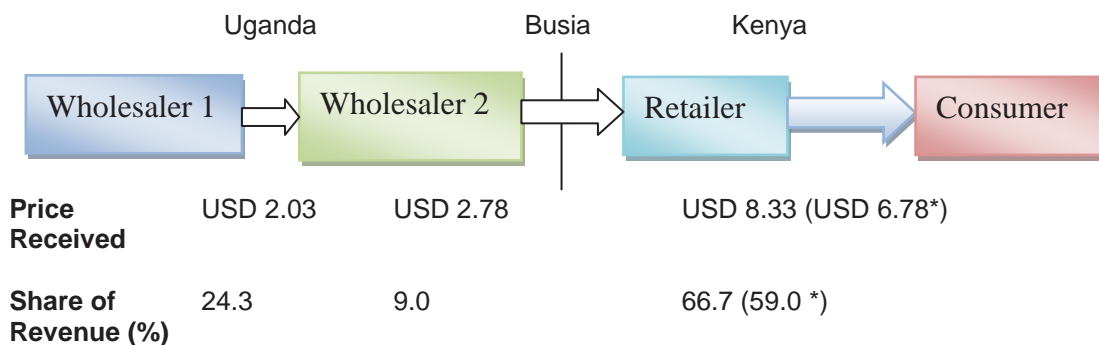
** Fruits that go through Katuna border points. The Butare and Katuna border points present lower share of revenue compared to Akanyaru Haut border.

5.3.10.8 Price and revenue distribution along the Uganda-Kenya Transboundary banana trade corridor



Production area is Bududa in Uganda. *Malaba; **Lwakhakha border points.

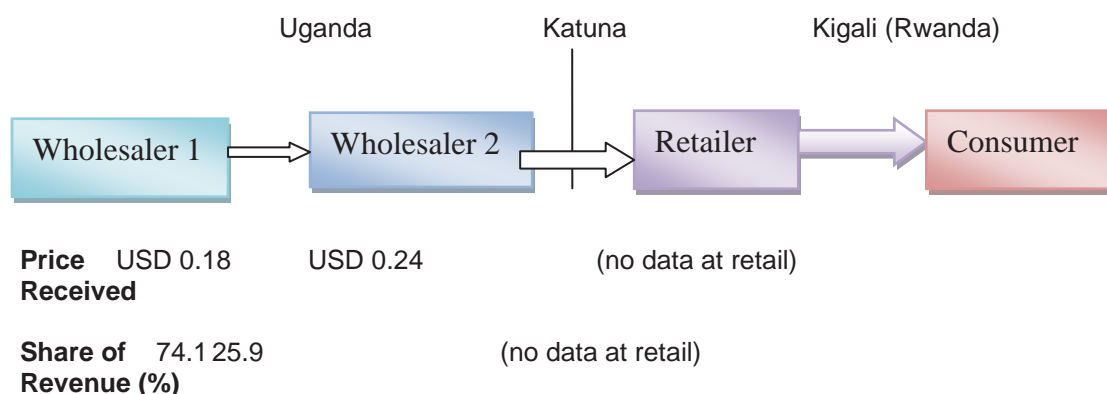
5.3.10.9 Price and revenue distribution along the Uganda-Kenya Transboundary banana trade corridor



Production area is Ntungamo in Uganda. *Malaba border point.



5.3.10.10 Price and revenue distribution along the Uganda-Rwanda Transboundary pineapple trade corridor



5.3.11 Analysis of storage and marketing costs

Storage infrastructure and post-harvest losses

Results in Table 5.33 indicate that most traders of passion fruits (97.8 percent), Irish potatoes (94.28 percent) and bananas (85.71 percent) have storage facilities. While producers of Irish potatoes (51.4 percent), passion fruits (23.9 percent) and bananas (4.2 percent) have storage facilities, those of pineapple producers do not have any.

Table 5.33: Possession of storage facilities along the corridor

Type of crop	Percentages			Overall traders
	Producers	Retailers	Traders	
Bananas	4.2	100.0	71.4	85.7
Passion fruits	23.9	95.7	100.0	97.8
Irish Potatoes	51.4	95.2	93.3	94.3
Pineapples	0.0	53.6	46.4	50.0

In most cases, pineapples, bananas and passion fruits are harvested and taken directly by the producers to the market or traders go to buy them when they are still on the farm. As for the Irish potatoes, the producers have storage facilities for keeping some of the potatoes as seedlings to be used in the planting season. Another factor that could contribute to possession of storage facilities is the fact that it takes a lot of time to harvest potatoes and hence the need to assemble them as the farmer waits for buyers to come and buy them at farm. Also storage is required to due to their bulkiness.

According to Tables 5.34 and 5.35 the most predominant type of storage for traders are the stalls in the markets (87.3 percent) at the retail or wholesale markets or just where they operate their businesses. Most of the sheltered markets have stalls that have spaces where commodities can be stored. This saves the traders the inconvenience and trouble of moving their wares. However the retail market can also refer to open air markets that have no shelters but the commodities (such as bananas) are just covered and left in the open grounds and security is provided by the market authorities.

Table 5.34: Type of storage infrastructure used by traders along the corridor

Type of store	Percentages				
	Bananas	Passion fruits	Pineapples	Irish potatoes	Overall
Improved	4.7	4.7	6.1	17.6	8.3
Traditional	1.6	0.0	0.0	4.7	1.7
Holding ground	3.1	2.3	3.3	1.2	2.4
Room in the house	0.0	0.0	0.0	1.2	0.3
Stall in the market	90.6	93.0	90.0	75.3	87.3
Total	100	100	100	100	100

Table 5.35: Point of storage for producers and traders

Point of storage	Percentages			
	Bananas	Passion fruits	Pineapples	Irish Potatoes
On farm	0.0	0.0	6.1	3.5
Rural collecting point	9.4	0.0	0.0	3.5
Retail market	87.5	90.7	87.9	72.9
Wholesale market	3.1	4.7	3.0	15.3
Others	0.0	0.0	9.1	4.7
Total	100	100	100	100

Estimation of post-harvest storage-related losses

Banana, passion fruits and pineapple producers do not experience post-harvest losses because the traders buy the commodities at the farm gate; the traders have the option to take the produce right away or they can harvest it later at their own convenience. Most areas have market days which occur on average two times a week and most producers prefer to just harvest and take to the market immediately or wait for buyers to come to the farm therefore limiting the incidences of post harvest losses for the producers.

Irish potatoes registered post-harvest losses of 14 percent of the total farm level production. This translates to mean value of 345 US\$ per ton. These are very significant losses which can be attributed to poor post harvest handling and storage which results in rotting of the potato tubers. Irish potato producers select and store part of their produce to be used as planting materials during the subsequent planting season. It is during such periods that most of the losses occur due to rotting. There should be measures put in place to educate the farmers on how to reduce post harvest losses.

Factors contributing to storage losses

Table 5.36 shows the factors that contribute to storage losses which include; damage during transit to the market (28 percent), rotting (25 percent), poor post-harvest handling (20 percent) and theft (16%). Rotting can be attributed to the nature of the commodities which are perishable and therefore should be disposed fast enough. Poor packaging results in damage during transit while lack of knowledge by the producers and traders on how to handle the fruits and vegetables after harvesting contributes to storage losses. Theft is mainly as result of lack adequate of security during transportation where bananas, passion fruits, and pineapples are pinched by either the loaders or in stores where there are no adequate security personnel.

Table 5.36: Reasons for storage losses

Reasons for losses	Mean Percentages				
	Bananas	Passion fruits	Pineapples	Irish Potatoes	Overall
Pest damage	0	6.9	5.3	1.8	3.5
Poor post-harvest handling	27.3	6.9	36.8	8.8	20
Fire	0	3.4	0	0	0.9
Rotting	0	31	5.3	63.2	24.9
Over ripening	0	10.3	0	0	2.5
Deterioration in quality due to late or early harvesting	0	6.9	0	3.5	2.6
Theft	40.9	10.3	10.5	1.8	15.9
Damage during transit	31.8	24.1	42.1	15.8	28.4
Poor storage	0	0	0	5.3	1.3
Total	100	100	100	100	100

Storage Capital Costs

As results in Table 5.37 indicate, on average passion fruits and pineapples have higher storage operating costs per US \$ per ton as compared to bananas and Irish potatoes. This can be attributed to the fact that a tonne of Irish potatoes would occupy less space due to its bulkiness as compared to a tonne of passion fruits which would require more space and therefore a passion fruit trader will to spend more. This could also indicate that passion fruit and pineapple traders could be paying more for other services such as security due the nature of the commodities that be easily be stolen.

Table 5.37: The operating costs of storage

Operating costs of storage					
Commodity	n	Minimum	Maximum	Mean	Standard Deviation
Bananas	40	0.01	3353.78	152.49	542.15
Passion fruits	24	0.63	1095.07	247.88	358.25
Pineapples	17	1.15	1088.19	167.95	275.38
Irish Potatoes	43	0.02	729.61	80.77	160.33

The cost of operating the most predominant type of storage used by traders (stall in the markets) was highest for Irish potatoes with a cost of US\$ 110.58 while Pineapples had the lowest cost of operating at US\$ 48.59 (Table 5.38).

Table 5.38: Operating costs of different types of storage structures

Type of store	Mean (in US \$)			
	Bananas	Passion fruits	Pineapples	Irish Potatoes
Improved	131.61	101.53	4.07	528.43
Traditional	173.09	0.00	0.00	258.52
Holding ground	304.87	0.00	1776.80	5.66
Stall in the market	68.17	61.77	48.59	110.58

Among the bananas and passion fruit traders the cost of operating the stalls in the market was US\$ 61.77 and US \$ 48.59 respectively. The other types of storage infrastructure were sparingly used by the traders and thus giving very low operating costs.

Management and ownership

Fruits and vegetable market facilities, including stores, are constructed by local councils which are under the central governments. The local councils rent out the facilities to the traders who manage them (either themselves or by using their employees). Ownership of storage facilities by the traders is not a common practice (Table 5.39). Most of the store managers are male (about 65 percent) possibly due to the fact that the communities in the region are patriarchal in nature and men have control over ownership and management of most of the productive resources. The men often buy the commodities in bulk then sell to the female retailers in smaller quantities.

Table 5.39: Storage facilities ownership

Ownership	Mean percentages				
	Bananas	Passion fruits	Pineapples	Irish Potatoes	Overall
Self	6.3	4.5	12.9	8.3	8
Group/co-op	0	2.3	0	1.2	0.9
Rented	23.8	31.8	19.4	36.9	27.9
Daily hire	11.2	15.9	3.2	10.7	10.3
Government	58.7	45.5	64.5	39.3	52
Others	0	0	0	3.6	0.9
Total	100	100	100.0	100	100

Comparative analysis: formal compared to informal trade

As indicated in Table 5.40, generally stalls in the market are the most predominant type of storage among both the formal and informal traders of the fruits and vegetables. This is as result of traders renting stalls which are used both as selling places and stores for their commodities. Majority of the pineapple traders have the highest number of informal traders using the improved type of stores followed by Irish potatoes as compared to the other commodities in the corridor.

Table 5.40: Type of storage among the formal and informal producers and traders (percent)

		Improved	Traditional	Room in the house	Holding ground	Stall in the market
Banana(producers)	Formal	33.3	66.7			
Bananas (traders)	Formal	4.8	1.6		3.2	90.3
	Informal	4.7	1.6		3.1	90.6
Passion(producers)	Formal	41.2		58.8		
Passion(traders)	Informal	4.7			2.3	93.0
Pineapple (traders)	Formal	3.7			3.7	92.6
	Informal	25			0.0	75.0
Irish Potatoes(producers)	Formal	47.3	38.2	14.5		
Irish potatoes(traders)	Informal	17.6	4.7	1.2	1.2	75.3

Ownership of storage facilities by producers, as opposed to hiring, was dominant among the formal producers (Table 5.41). Most of the storage facilities for Irish potatoes and passion fruits were owned and managed by the producers while for the bananas they were rented and managed by hired labourer or hired employee.

In the traders' category of bananas and pineapples, storage facilities in the formal and informal channels were managed by both male and female with the men still taking the larger share in terms of management of the stores. Passion fruits and Irish Potatoes stores were only found in the informal traders. Women were the majority managers of storage facilities in the informal trade category of Irish potato traders while for the passion fruits men were still dominant (Tables 5.41 and 5.42).

Table 5.41: Ownership of storage infrastructure by formal and informal producers and traders (percent)

		Self	Group /coop	Rented	Hired	Government	Friends	Others
Banana(producers)	Formal			33.3			66.7	
Banana(traders)	Formal	6.3		22.2	11.1	57.1		
	Informal			1.6		1.6		
Irish potato(Producers)	Formal	72.7	20	3.6	3.6			
Irish potatoes(traders)	Informal	8.3	1.2	36.9	10.7	39.3		3.6
Passion(Producers)	Formal	64.7	5.9	29.4				
Passion (traders)	Informal	4.5	2.3	31.8	15.9	45.5		
Pineapple(Traders)	Formal	11.7		17.6	2.9	44.1		8.8
	informal					11.8		2.9

Most of the storage facilities for formal CBT were managed by the owner (Table 5.42). A few others were managed by an employee or hired labourer and/or retailer/trader.

Table 5.42: Management of the storage facilities for the informal and formal producers and traders (percent)

		Owner	Employee	Retailer or Trader	Coop/group	Wholesaler	Volunteer
Banana (producers)	Formal		100				
Banana (traders)	Formal	40.7	1.9	51.9		1.9	
	Informal	1.9		1.9			
Irish Potatoes (Producers)	Formal	82.2	2.2		15.6		
	Informal	45.9		51.4		2.7	
Passion (producers)	Formal	80.0	13.3				
	Informal	48.5	3.0	48.5			
Pineapples	Formal	53.0		23.5		2.9	5.9
	Informal	5.9				2.9	5.9

The management of the storage facilities was skewed in favour of men for all the commodities (Table 5.43). In the traders' category, bananas and pineapples the storage facilities were found in the formal and informal traders and managed by both male and female with the men still taking the larger share in terms of management of the stores. Passion fruits and Irish potatoes stores were only found in the informal traders. Women were the majority managers of storage facilities in the informal trade category of Irish potato traders while for the passion fruits men were still dominant.

Table 5.43: Gender of the person managing the store (percent)

		Male (Traders)	Male (Producers)
Banana	Formal	60.3	100
	Informal	1.6	0
Irish potatoes	Formal	0	100
	Informal	44.2	55.8
Passion	Formal	0	82.4
	Informal	79.5	20.5
Pineapples	Formal	68.8	0
	Informal	6.2	0

TRANSPORT INFRASTRUCTURE COSTS

Human transport, motorcycles and bicycles are the prevalent modes of transport for producers at 67.8 percent, 11.5 percent and 6.8 percent respectively (Table 5.44). These are mainly used to carry commodities from the farms to the nearest markets where the commodities are bought by the traders (brokers or the wholesalers) who use either the small or big trucks to transport the commodities to markets. The humans are porters who carry smaller units of the commodities to the markets which are then assembled and sold to the bigger buyers. They are mainly used in areas where there is poor road infrastructure coupled with poor weather conditions which make the roads impassable or non-motorable altogether.

Table 5.44: Modes of transport for producers of different commodities

Mode of transport	Percentages				
	Bananas	Passion fruits	Pineapples	Irish Potato	Overall
Human	95	42.3	0	66	67.8
Big truck	0	0.0	0	4	1.3
Hand Cart	0	0.0	0	0	0.0
Animal cart	0	0.0	0	18	6.0
Bicycle	5	15.4	0	0	6.8
Motorcycle	0	34.6	0	0	11.5
Pick up	0	0.0	0	0	0.0
Boat	0	0.0	0	0	0.0
Small truck	0	3.8	0	2	1.9
Saloon car	0	3.8	0	0	1.3
Tractor	0	0.0	0	10	3.3
Total	100	100	0	100	100

Table 5.45 shows the most prevalent mode of transport used by traders. These include humans (42.3%), big trucks (13%), Nissan taxis (7.7%) and small trucks (7.6%). Among the banana traders human, small trucks and big trucks were used by 35.7%, 19% and 19% respectively. For passion fruits the modes of transport are humans, motorcycle and Nissan taxis at 38.9%, 27.8% and 22.2% respectively while for the pineapples traders human, hand carts and pickups were used by 37.5%, 31.3% and 12.5% respectively. The Irish potato traders use mainly humans (57.1%), big trucks (14.3%) and the small trucks (11.4%). For the traders who get their commodities from the producers they use the pickups, small and big trucks.

Table 5.45: Modes of transport for traders of different commodities

Mode of transport	Percentages				
	Bananas	P/fruits	Pineapples	I/Potatoes	Overall
Human	35.7	38.9	37.5	57.1	42.3
Big truck	19.0	5.6	12.5	14.3	12.8
Nissan taxis	2.4	22.2	6.3	0.0	7.7
Hand Cart	7.1	0.0	31.3	5.7	11.0
Motorcycle	2.4	27.8	0.0	0.0	7.6
Bicycle	9.5	0.0	0.0	5.7	3.8
Boat	0.0	0.0	0.0	2.9	0.7
Pick up	4.8	5.6	12.5	2.9	6.5
Small truck	19.0	0.0	0.0	11.4	7.6
Total	100	100	100	100	100

Table 5.46 indicates the transport costs to traders in US \$ per ton and their percentage values to values of the traded commodities. It should be noted that most of the traders in the markets in the study area only transport within the market area. This is because most brokers or middlemen (who operate in a cartel-like manner) bring the fruits and vegetables to the market where they are collected by retailers and wholesalers. Therefore the retailers and wholesalers do not incur costs of transporting the produce from the producers to the markets. Unfortunately it proved a daunting task for the team to interview the big transporters who were transporting the commodities because some of them would arrive in the wee hours of the morning and were not willing to be interviewed. Others simply were not willing to divulge any information because most of them were just hired. The owners of the produce were not co-operative in interviews.

Table 5.46: Traders’ transport costs and their percentage value to the commodity value

Mode of transport	Bananas		Passion fruits		Pineapples		Irish potatoes	
	Cost per ton- US \$	% value	Cost per ton- US \$	% value	Cost per ton- US \$	% value	Cost per ton- US \$	% value
Human transport	121.94	27.7	3.67	0.7	0.27	0.0	0.33	0.2
Hand cart	33.34	7.6	0.00	0.0	1.10	0.2	0.11	0.1
Motorcycle	15.59	3.5	16.42	3.0	0.00	0.0	0.00	0.0
Big truck	-	-	27.54	5.0	-	-	-	-
Nissan taxi	198.06	45.0	16.01	2.9	1.98	0.4	0.00	0.0
Bicycle	122.89	27.9	0.00	0.0	0.00	0.0	1.93	1.0
Pick up	-	-	58.7	10.7	52.9	9.4	4.49	2.3
Small truck	66.08	15.0	0.00	0.0	0.00	0.0	56.97	29.5
Wheel barrow	0.00	0.0	0.00	0.0	0.30	0.1	0.00	0.0

In Table 5.47, bananas had the highest cost of transport with an average of US\$ 274.33 per ton (62% of commodity value) while passion fruits had an average cost of US\$ 14.33 per ton (3% of commodity value). The average cost of transporting pineapples and Irish potatoes was US\$ 154.83 and 73.12 per ton (28% and 38% of commodity value), respectively. The high cost of transporting bananas can be explained by the high demand, being a staple food for the communities in the area under study. Therefore the commodity has to reach the market and the customers at whatever cost.

Table 5.47: Cost of transport to traders by commodity (US\$ per ton)

	Sample (N)	Minimum	Maximum	Mean	Std. Deviation
Bananas	42	.05	3616.05	274.33	627.31
Irish potatoes	35	.00	828.53	73.12	213.78
Passion	18	.04	58.66	14.33	17.39
Pineapple	15	.02	1700.29	154.83	447.30

Determinants of transport prices and costs

Costs were determined by the quantity of the commodities transported. For example banana traders would assemble larger volumes of bananas in order to hire one big truck rather than carrying only few bunches using other smaller means which would be expensive. This is also determined by capital availability because if one does not have enough money to buy large quantities to hire a truck that is cost-effective, then the traders have to pool resources together to afford transport costs. The cost of transport was also determined by the type of market structure. For instance there were very few people with the means to afford buying trucks which led to monopolies for the few transport owners who formed cartel-like businesses. Costs were also determined by the distances travelled by traders and the kind of roads used. In mountainous areas which were inaccessible to commonly used vehicular transport, traders were forced to use human transport which is not cost-effective. Most of the production areas for fruits and vegetables were characterised by very poor road infrastructure which discouraged transport owners and thus increased the cost of transport.



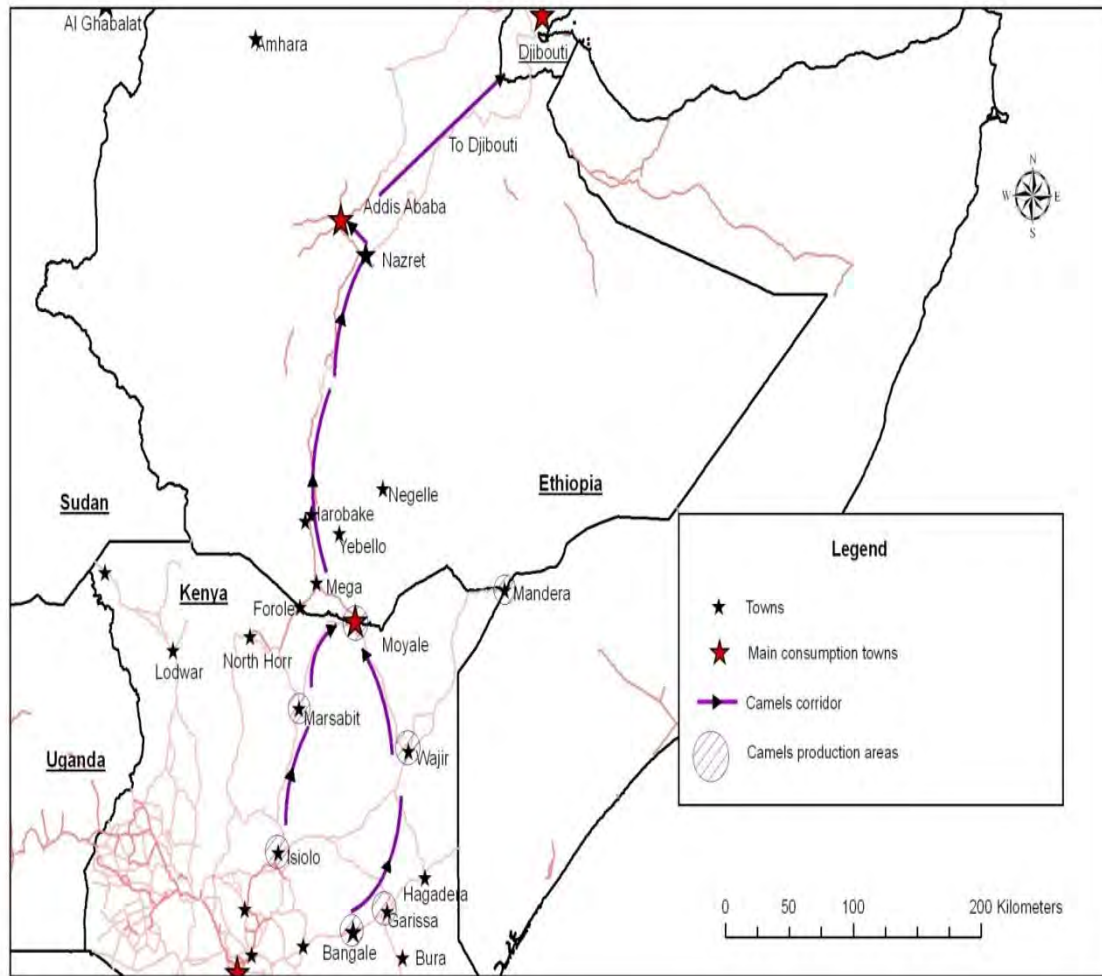
5.4 Live Livestock Corridors

5.4.1 Characterization of the trade corridors

Two main live livestock corridors were surveyed; Corridor 1 constituted the movement of live livestock between Kenya and Ethiopia and Ethiopia and Sudan. Corridor 2 was for the movement of livestock between Sudan and Egypt.

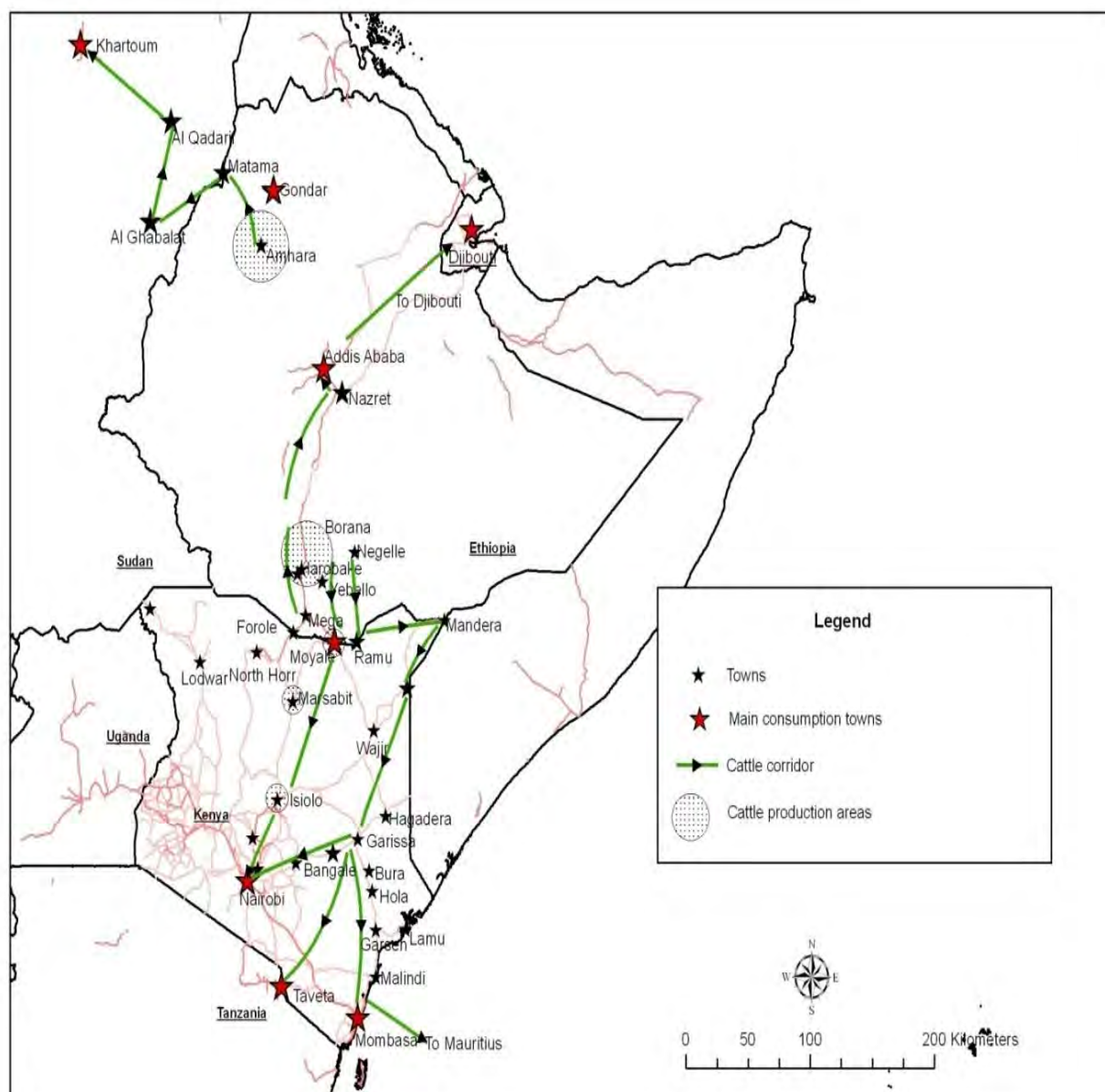
5.4.1.1 Corridor 1 - Movement of live livestock between Kenya and Ethiopia

Camels moved from the main production areas in Kenya, namely Mandera, Wajir, Garissa, Bangale, Isiolo, Marsabit and Moyale to into southern Ethiopia through the Moyale border crossing (Map 5.12). From there, the camels were trucked to Nazaret (also called Agre Mariam) for fattening and then later trucked to Djibouti for export. The export occurred roughly on a quarterly basis using a ship with capacity to carry up to 6,000 male adult camels. Some traders from as far as Isiolo monitored movement of the ship such that its arrival coincided with sufficient stock at their disposal. A few camels found their way to the city of Addis Ababa. The net flow of camels was from Kenya into Ethiopia.



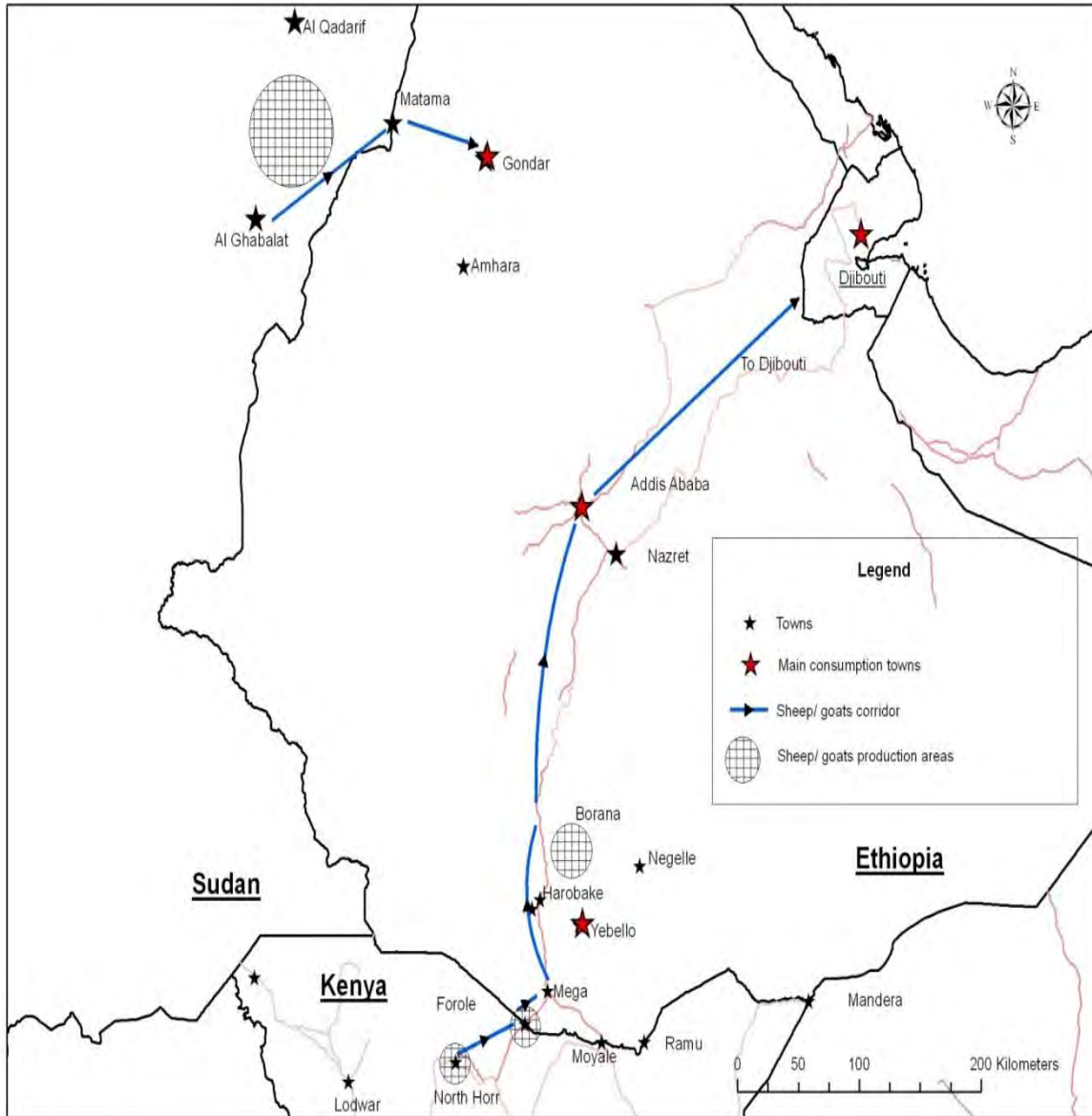
Map 5.12: Production and trade in camels along the Kenya/Ethiopia Livestock Corridor (Corridor 1) *Source:* Survey data

The cattle sold to Kenya mainly originated from Region 4 and 5 (based on the administrative system) of Ethiopia (Map 5.13). The two regions are separated by the Moyale-Addis Ababa road, with Region 4 being located to the west of the road and Region 5 to the East. Region 4 comprises of the following areas/districts: Dikhara, Yabello (Taltale), Mega and Iddi Lola. On the other hand, Region 5 comprises of Arero, Web, Das, Dubluq and Madacho. The cattle cross into Kenya via Sololo and Moyale borders points and are then trucked to Nairobi and Thika via Isiolo. A few cattle end up in Nanyuki farms for fattening. Some cattle also come from northern Kenya (mainly Isiolo, Marsabit and Moyale) and cross the border through Moyale and trek to various markets in southern Ethiopia before entering Nazret for fattening. Some of these cattle end up either in Addis Ababa (for consumption) or Djibouti (for export). The cattle from the Somali region (around Negelle area) of southern Ethiopia cross the border at Ramu and are sold in Manderla and then in Garissa livestock markets. Some of these cattle are trucked to Nairobi for consumption and some are trekked to Taita ranches in Coast Province and eventually trucked to Mombasa for export (mainly to Mauritius). The net flow of cattle is from Ethiopia into Kenya.



Map 5.13: Production and trade in cattle along the Kenya/Ethiopia Livestock Corridor (Corridor 1) *Source:* Survey data

Goats and sheep flowed in both directions. Those originating from northern Kenya (mainly around Forole) crossed the border around Elewaiye and Mega in southern Ethiopia (Map 5.14). They were then trucked via a series of sales transactions in various markets finally ending in either Addis Ababa (for consumption) or Djibouti for export. Those originating from southern Ethiopia (around Mega) crossed the border at the Sololo border point into Kenya from where they were trucked to Nairobi for sale. The net flow of sheep and goats was from Kenya into Ethiopia.



Map 5.14: Production and trade in sheep and goats along the Kenya/Ethiopia Livestock Corridor (Corridor 1)

Source: Survey data

Table 5.48 summarizes the net flow of different categories of live livestock between Kenya and Ethiopia.

Table 5.48: Summary of the flow of live livestock between Kenya and Ethiopia

Species	Main production areas	Main markets	Main consumption towns	Net commodity flow
Camels	Kenya: Mandera, Wajir, Garissa, Bangale, Isiolo, Marsabit, Moyale	Moyale (Ethiopia) →Harobake (Ethiopia) →Nazaret (for fattening)→Addis Ababa or Djibouti for export	Moyale (Ethiopia), Addis Ababa	Kenya→Ethiopia
Cattle	Southern Ethiopia comprising Regions 4 & 5 in the Borana and Somali areas + Northern Kenya (Isiolo, Marsabit & Moyale)	In Ethiopia: Elewayie→Yabello→Dubuluq/Mega →Harobake→Nazaret→Addis Ababa→Djibouti [for Export] In Kenya: 1. Southern Ethiopia (Yabello, Harobake, Mega/Dubluq), Moyale (Kenya) →Isiolo→Nairobi 2. Negelle (Ethiopia) →Ramu (Kenya/Ethiopia border) →Mandera→Garissa→Nairobi or Mombasa or Taita Ranches→Mauritius [Export]	1. Moyale (Ethiopia), Addis Ababa 2. Thika, Nairobi, Mombasa	1. Ethiopia→Djibouti 2. Ethiopia→Kenya
Goats & sheep (very few sheep)	Northern Kenya (North Hall, Forole), Southern Ethiopia (or Borana & Somali areas)	1. From northern Kenya: North Hall →Forole →Elewaiye →Yabello→Harobake →Addis Ababa or Djibouti for export OR: North Hall →Forole →Mega/Dubluq →Harobake →Addis Ababa or Djibouti for export 2. From southern Ethiopia: Around Mega→Sololo→Nairobi	Elewaiye, Yabello, Addis Ababa	Kenya→Ethiopia

Movement of live livestock between Ethiopia and Sudan

Only cattle, goats and sheep were traded across this corridor; camels were not. Cattle moved from the Amhara Region in western Ethiopia into Sudan through Matama (in Ethiopia)/Galabat (in Sudan) border crossing (Map 5.12). Some of these cattle were consumed around Al Qadarif town in Sudan while the rest are trekked to Khartoum for slaughter. No cattle from Ethiopia were exported to Egypt from Sudan. According to key informants, the Egyptians prefer the desert small Sudan zebu breed because of its good taste. The Ethiopian cattle were said to have a rather “flat” taste relative to the Sudanese zebu. The net cattle flow was from Ethiopia into Sudan (Map 5.15).

Goats and sheep came from the Blue Nile State around Ad-Damazin and Al Qadarif towns (Map 5.15). These are trekked into Ethiopia through Matama and some were sold in Gondar town in Amhara and the rest were trucked to Addis Ababa for slaughter. The net flow of sheep and goats was from Sudan to Ethiopia. A summary of this information is given in Table 5.49.

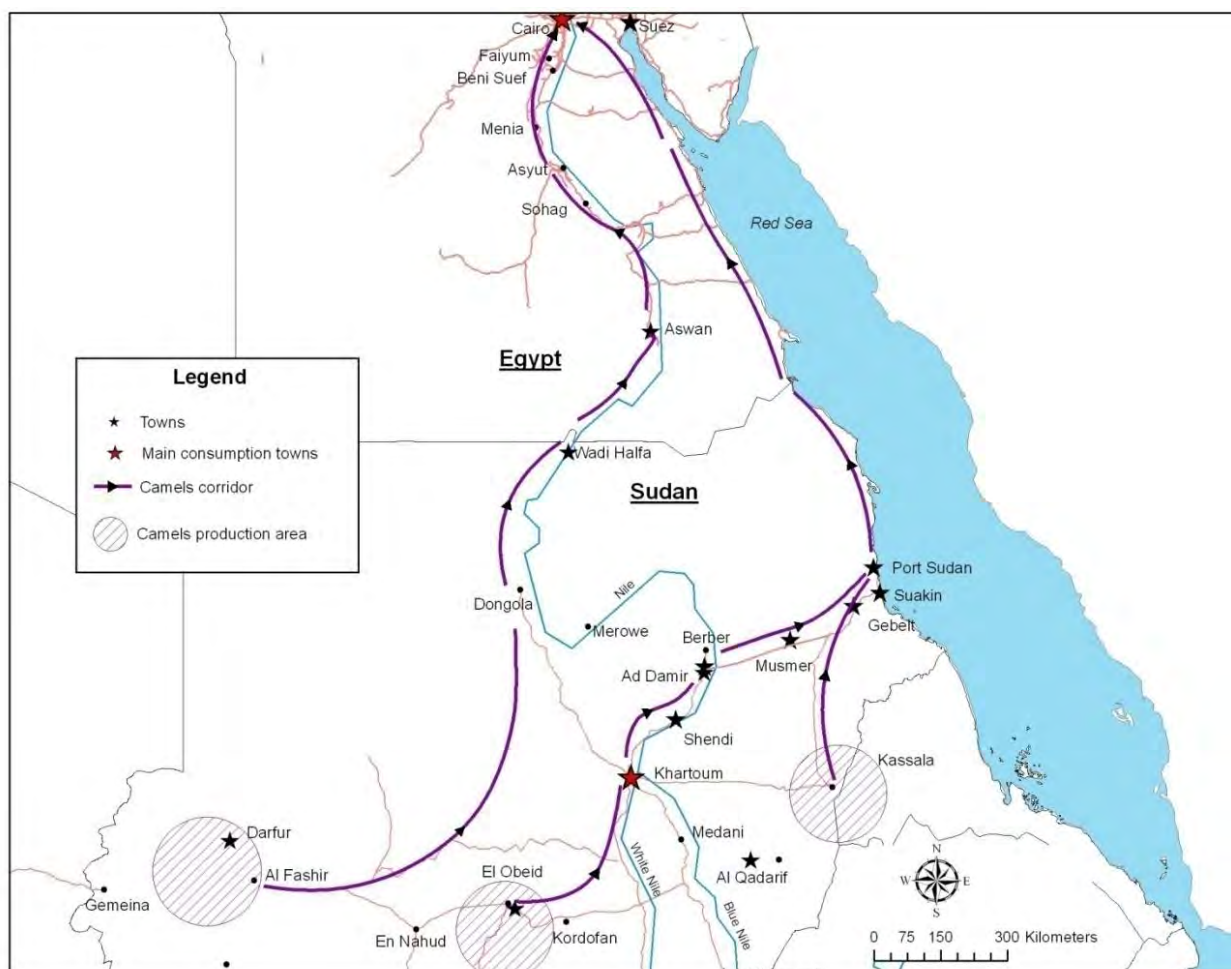
Table 5.49: Summary of the flow of live livestock between Ethiopia and Sudan

Species	Main production areas	Main markets	Main consumption towns	Net commodity follow
Cattle	Western Ethiopia comprising the Amhara region	Matama (in Ethiopia)→Al Galabat (in Sudan)→Al Qadarif→Khartoum [No Ethiopian cattle are exported to Egypt from Sudan because the Egyptians prefer the small Sudan zebu due to its good taste]	Khartoum	Ethiopia→Sudan
Goats & Sheep	Blue Nile State around Ad-Damazin & Al Qadarif	Al Galabat (in Sudan) →Matama (Ethiopia) →Gondar (Amhara Region)	Gondar, Addis Ababa	Sudan→Ethiopia

Source: Survey data

5.4.1.2 Corridor 2: Movement of live livestock between Sudan and Egypt

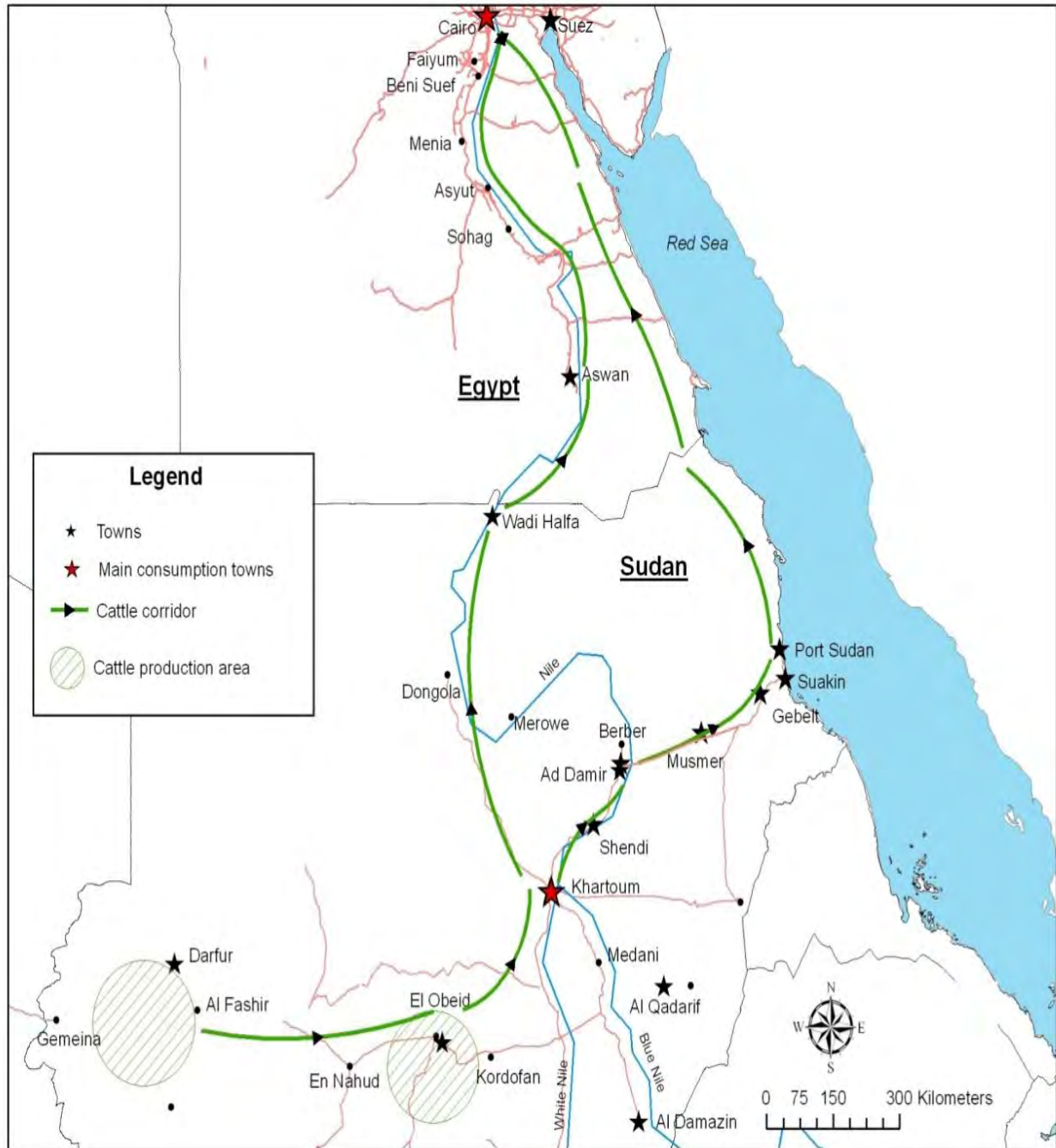
All the four livestock species considered in this study were traded between Sudan and Egypt. Camels originate from three main areas: (i) around Geneina in Al Junaynah, Nyala and Al-Fashir in Darfur region bordering Chad, (ii) around Kaduqli and El Obeid areas in South and North Kordofan in southern central Sudan and (iii) around Kassala located to the east of Khartoum (Map 5.16). Camels from the Darfur region trek via the 40 road to Wadi Halfa town which borders Egypt, then they cross the Aswan dam by steamer and are finally trucked to Cairo by road. Some of the camels originating from El Obeid trek to Khartoum for slaughter. Others were trucked to Port Sudan and then to Cairo via the Red Sea road. The camels from Kassala area are trucked to Port Sudan and then they are transported to Cairo via the Red Sea road.



Map 5.15: Production and trade in camels along the Sudan/Egypt Livestock Corridor (Corridor 2)

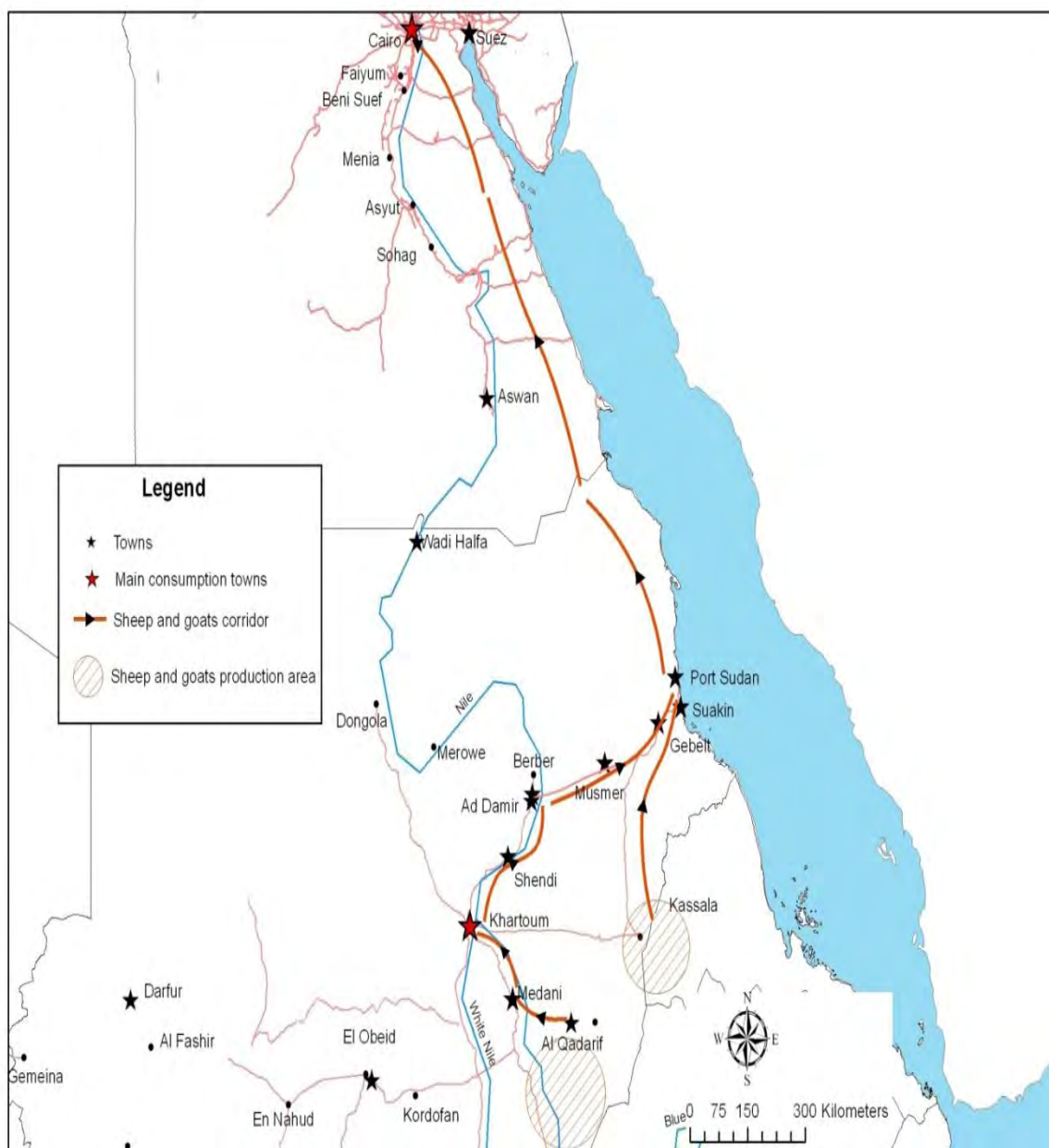
Source: Survey data

Like camels, cattle originate from the Darfur region and in the South and North Kordofan States. All the cattle were trekked to Khartoum. Some were slaughtered in Khartoum while others were trucked to Wadi Halfa town and then by steamer to Aswan and then to Cairo by road. The rest were transported to Port Sudan and then to Cairo by the Red Sea road (Map 5.16).



Map 5.16: Production and trade in cattle along the Sudan/Egypt Livestock Corridor (Corridor 2)
 - **Source:** Survey data

Sheep and goats mainly originated from the Blue Nile State from where they are trucked to Khartoum for slaughter (Map 5.17). Others were slaughtered in Khartoum and transported by air to Cairo. Yet others were trucked to Port Sudan via the Red Sea road to Cairo.



Map 5.17: Production and trade in sheep and goats along the Sudan/Egypt Livestock Corridor (Corridor 2)

Source: Survey data

The net flow of the four livestock species (camels, cattle and goats and sheep) was from Sudan to Egypt (see Table 5.50 for a summary). According to El-Nahrawy (2011)¹⁶, Egypt has no surplus animals for export except some limited numbers of sheep and goats.

¹⁶<http://www.fao.org/ag/AGP/AGPC/doc/Counprof/PDF%20files/Egypt.pdf> - May 2012

Table 5.50: Summary of the flow of live livestock between Sudan and Egypt

Species	Main production areas	Main markets	Main consumption towns	Net commodity follow
Camels	<ol style="list-style-type: none"> 1. Darfur region (around Geneina in Al Junaynah, Nyala & Al-Fashir) 2. South & North Kordofan (around Kaduqli & El Obeid) 3. Kassala area 	<ol style="list-style-type: none"> 1. Al-Fashir via 40 Road →Wadi Halfa [border market]→Aswan (Egypt)→Cairo 2. El Obeid→Khartoum→Ad Damir→Port Sudan→Cairo [via Red Sea road] 3. Kassala→Port Sudan→Cairo [via Red Sea road] 	Khartoum, Aswan (Egypt), Port Sudan (Sudan), Cairo	Sudan→Egypt
Cattle	<ol style="list-style-type: none"> 1. Darfur region (around Geneina in Al Junaynah, Nyala & Al-Fashir) 2. South & North Kordofan (around Kaduqli & El Obeid) 	<ol style="list-style-type: none"> 1. Al-Fashir→El Obeid→Khartoum→Wadi Halfa [border market]→Aswan (Egypt)→Cairo 3. Al-Fashir→El Obeid→Khartoum→Ad Damir→Port Sudan→Cairo [via Red Sea road] 	Khartoum, Aswan (Egypt), Port Sudan (Sudan), Cairo	Sudan→Egypt
Goats & sheep	Blue Nile State around Ad Damazin & Al Qadarif	<ol style="list-style-type: none"> 1. Al Qadarif→Madani→Khartoum→Ad Damir→Port Sudan→Cairo [via Red Sea Road] 2. Kassala→Port Sudan→Cairo [via Red Sea Road] 	Khartoum, Port Sudan, Cairo	Sudan→Egypt

Source: Survey data

5.4.2 Estimation of ICBT volumes, values and pattern of livestock trade

ICBT is mostly common in Corridor 1; in Corridor 2, ICBT is more formalized because the Sudanese government is currently depending on the livestock trade to meet its budget. Over the two months that ICBT was monitored between Kenya and Ethiopia, a total of 3,749, 2,837, 6,697 and 2,712 head of cattle, sheep, goats and camels respectively were traded between the two countries worth US\$2.2 million. These data were annualized by multiplying by 3 to account for seasonal fluctuation in production and trade due to weather-related effects. Cattle and sheep came from southern Ethiopia into Kenya through the Moyale border point. Goats also came from Ethiopia into Kenya through the Sololo border point. Although not shown in Table 5.51, some sheep and goats flow from Forole in Kenya into southern Ethiopia. Camels flowed from Kenya into Ethiopia.

Table 5.51: Estimates of volumes and values of ICBT in Corridor 1

Commodity	Border point	Direction of trade flow	Trade volume (Head)	Value (USD)
Camel	Moyale	Kenya→Ethiopia	297	86,727
Camel	Buladi	Kenya→Ethiopia	1,925	912,621
Camel	Rhamu	Ethiopia→Kenya	490	232,304
Cattle	Moyale	Ethiopia→Kenya	64	9,717
Cattle	Rhamu	Ethiopia→Kenya	1,192	180,985
Cattle	Sololo	Ethiopia→Kenya	708	107,498
Cattle	Gurumesa	Ethiopia→Kenya	1,785	271,023
Goats	Moyale	Ethiopia→Kenya	97	4,094
Goats	Rhamu	Ethiopia→Kenya	4,758	200,840
Goats	Sololo	Ethiopia→Kenya	129	5,445
Goats	Gurumesa	Ethiopia→Kenya	1,713	72,308
Sheep	Rhamu	Ethiopia→Kenya	1,529	63,199
Sheep	Sololo	Ethiopia→Kenya	103	4,257
Sheep	Gurumesa	Ethiopia→Kenya	1,205	49,807
Total			15,995	2,200,825

5.4.3 Seasonality in trade

Despite there being fairly well-defined directions of livestock flow in both corridors, the actual volumes exhibit considerable fluctuation from time to time and in some cases the flow may entirely change course such that a reverse movement is registered. The flow may also be analyzed on the basis of age of animals being moved. Whereas younger animals move from areas of low pasture and water availability, adult and fattened livestock tend to move from areas of higher potential to consumption markets especially in Corridor 1. The general trend, however, is that livestock move from areas of less pasture and water to areas of more pasture and water. The onset of rains in a particular area therefore significantly lowers supply of livestock to the market from such an area as each herder would then hope to increase his stock through reproduction while traders may now want to fatten the livestock for better prices in the near future. Both traders and herders tend to visit drier areas for possible access to livestock being disposed of at lower prices due to lack of pasture.

It is also important to note that unlike traders who aim at maximizing profit and would readily dispose of their stock at the onset of drought, pastoralists keep livestock mainly as a way of life and source of livelihood. The main preoccupation of the herder, therefore, is to maximize the herd at any given time. Some types of livestock such as cattle and camels are mainly kept for their milk; hence the higher the number the more secure that household is in terms of food supply. The onset of drought may therefore not automatically trigger disposal. This is partly because the information on weather is quite unreliable so the herders keep hoping the drought will not last for too long. The onset of rains therefore triggers faster reaction than that of drought because whereas it is relatively easy to tell the onset of rains, it is very difficult for the herders to tell how long the drought will last.

Periodic fluctuation in camel movement along the Kenya/Ethiopia border is mainly influenced by market/demand for camels since they are relatively hardy and less likely to significantly reduce in number due to drought-related factors. Some of the factors affecting demand include ceremonies in major camel-consuming regions such as the Middle East and the whereabouts of the ship that ferries camels to the Middle East. Camels are on higher demand towards end of the Muslim festivals of *Hajj*

and *Iddi*, and when the export ship is approaching the port of Djibouti. This pattern, however, is mainly for male adults only. The movement for young and female camels is mainly influenced by pasture availability though the direction is mainly from Somalia to Kenya then to Ethiopia. It is rare to find cattle moving from Kenya to Ethiopia because there is a more lucrative cattle market in Kenya while one directional movement of camels from Kenya to Ethiopia is because there is a more lucrative external market for camel. With regard to the Corridor 2, the movement of camels, cattle, sheep and goats to Egypt is mainly due to higher meat prices in Cairo.

5.4.4. Assessment of implications of ICBT to employment and food security

Cross-border trade in livestock is mainly informal both in Kenya and Ethiopia. In Ethiopia it has frequently been termed as “illegal” trade because it denies the government the much needed foreign exchange. In Sudan, cross-border trade is formalized. Indeed, since the reduction of oil revenues following the secession of South Sudan in 2011, the government of Sudan is depending on foreign currency obtained from livestock trade to meet its budget. Currently, livestock contributes about 22 percent of Sudan’s GDP and this is expected to grow significantly as the government refocuses on livestock production and trade.

Although it is hard to estimate the number of people involved in ICBT, a large number of players are directly employed along the trade corridors ranging from brokers/middlemen, trekkers, drivers, transporters and traders, and indirectly as service providers (feed, drugs and other input suppliers). In fact, the economies of towns along the trade corridors (e.g. Isiolo, Garissa, Mega, Dubluq, Yabello, Gondar, El Obeid, Khartoum, Kassala and Aswan) are significantly supported by ICBT. Regionally, FEWS-NET (2010) indicates that cross-border livestock trade supports about 17 million people, including livestock producers, traders and other groups such as trekkers, fodder traders, brokers and intermediaries, who directly or indirectly derive their entitlements from livestock production and trade. Although the role of women in ICBT is generally restricted, they get involved in marketing of livestock products such as hides, skins, milk and ghee.

The people who participated in focus group discussions were unanimous that ICBT plays an important role in food security provision. Particularly for small traders and pastoralists, the income earned is mostly used to purchase food besides financing other household expenses. This observation is corroborated by FEWS-NET (2010) which reports that the revenue generated from cross-border livestock trade is used to finance food imports, including sugar, rice, pasta, wheat flour and oil, from surplus areas within or outside the respective country, resulting in a self-sustaining production system that is based on comparative advantage. The same study indicates that it is common for pastoralists to obtain over half their annual food requirements from the market and over half their annual income from the sale of livestock and livestock products.

COMESA/CAADP (2009) notes that the trucks that ferry livestock from the border markets to terminal markets such as Nairobi, Addis Ababa, Berbera or Mombasa often bring foodstuffs on their return journey to sell back in the hinterland, a practice referred to as “backloading” (Pavanello, 2009). This flow of food commodities is largely financed by cross-border livestock trade. Any disruption of that trade (e.g. through a trade ban, closure of border, or even climate-induced livestock supply constraints), therefore, destabilizes the system by curtailing commodity flows, and governments, of necessity, have to feed the local population with food. For instance, the 2000 export ban of livestock from the Horn of Africa by the Kingdom of Saudi Arabia resulted in alterations in cross-border trade routes, changes in the number of traders, changes in livestock producers’ terms of trade (i.e., livestock to cereal terms of trade), fluctuations in livestock supply volumes, and modification of market actors’ transactional arrangements (FEWS-NET, 2010 p. 2).

5.4.5 Identification of constraints faced by traders

The main constraints faced by traders in live livestock are numerous and include:

- (i) Frequent drought which affect supply of livestock. This is particularly true in northern Kenya, Sudan and some parts of southern Ethiopia. On the other hand, excessive wetness affects camel production and trade
- (ii) Lack of marketing facilities such as holding grounds, watering points and troughs, feed barns, loading ramps, treatment/vaccination crushes, isolation facilities and fencing
- (iii) Police harassment en-route to market. This problem was particularly acute in Kenya. In the more than 100 police roadblocks, the traders had to part with at least KShs 50¹⁷. The women in Wajir mentioned a recent case where four of their camels died of starvation at a police road block on the way to Makinon Road (on Mombasa Road) for feeding. The truck was stopped by police who demanded too much money, a disagreement arose and their truck had to be kept parked for over 48 hours
- (iv) Poor road infrastructure – again, this was acute in Kenya. The Moyale-Isiolo, Mandera-Wajir-Garissa and Garissa-Garsen roads are in very poor conditions. Although there are plans to tarmac these roads, the work is yet to start. Poor road infrastructure increases transport and other transaction costs
- (v) Poor telecommunication infrastructure – In Kenya, the two major mobile phone service providers (Safaricom and Airtel) have not yet installed their network between Moyale and Marsabit and between Marsabit and Isiolo. There is also no telephone roaming services between Kenya and Ethiopia, which constraints communication
- (vi) Lack of watering and feeding facilities en-route to the market. This problem was experienced in both corridors
- (vii) Lack of well equipped vehicles specifically meant for the transportation of animals. Traders just pack their animals in trucks normally used for all transportation purposes e.g. carrying sand and other materials. As a result, the animals get stressed during loading, en-route to the market and when unloading
- (viii) Far flung markets – most of the terminal markets are located very far from the production areas (in some cases more than 100 km away) such that it takes long to drive the animals to these markets either on truck or on hoof. The latter method usually takes time (up to several weeks or months for example in the case of Sudan) and leads to loss of body condition besides exposing the animals to predation, loss through theft (rustling) and/or straying and disease en-route to the market.
- (ix) Foreign currency crunch – In Sudan, the government has imposed a cap on the amount of foreign currency that the traders should transact in, which limits their liquidity.
- (x) Multiple taxation – In both corridors, traders are required by law to pay for animal health certificates (or movement permits in Kenya) and mandatory vaccinations (e.g., in Sudan and Kenya). In the case of Sudan where animals move between States, the traders pay taxes to each State

¹⁷1US\$=KShs 80 at the time of the study

(xi) Civil conflict – e.g. in Darfur, Kordofan and the ongoing war in Somalia affects livestock supply and increases the risk of rustling or outright theft of traders’ income. Sometimes there are also resource-based conflicts, for example in Kenya and southern Ethiopia where pastoralists often clash among themselves and also with the agrarian communities

(xii) Market price volatility – depending on the season, prices fluctuate widely. For instance, during the dry season animals lose condition and therefore fetch low prices. During the wet season, animals gain condition and pastoralists are generally reluctant to sell their animals in order to build their herds. Additionally, prices harden during seasonal ceremonies such as Easter, Christmas, *Haji*, *Idd* and traditional ceremonies due to high demand. Insecurity and/or ethnic clashes are other causes of price volatility since they interfere with movement of both livestock and traders.

(xiii) High marketing costs and brokerage – traders complained of high marketing costs that include brokerage fees, local county taxes (cess), and the high number of brokers operating in the livestock markets a situation that increased their marketing costs due to high brokerage costs and weak enforcement of informal contracts and property rights.

Table 5.52 shows the marketing costs in selected livestock markets in Ethiopia

Table 5.52: Marketing costs in selected livestock markets in Borana Zone, southern Ethiopia

Market	Livestock species	Marketing costs (Birr/head)			
		Taxes	Broker fees	Trekking	Caretaker
Elewaiye	Cattle	12	20	10	2
	Sheep	5	10	5	Paid in kind
	Goats	5	10	5	Paid in kind
	Camels	12	50	50	Paid in kind
Dubluq	Cattle	14	40	30	15
	Sheep	10	10	-	6-7
	Goats	10	10	-	6-7
	Camels	20	50-150	50	20
Yabello	Sheep	5	10	6	2
	Goats	5	10	6	2

Source: Survey data

1US\$=17.8 Ethiopian Birr at the time of the study. Trekking charged per 30km distance

5.4.6 Gender and youth dimensions of informal trade along the corridor

Informal livestock trade is predominantly a male affair, perhaps in reflection of the fact that livestock in most pastoralist communities belong to the household head who in most cases, is male. For instance, among the Borana of southern Ethiopia, the man makes important decisions regarding production and marketing of the livestock with clear gender-based division of labour. Elderly men, who are usually the household heads scout for areas that could have better pasture for the various types of cattle, e.g., the lactating, bulls that need fattening and calves. They then instruct the male youths to drive the various categories of livestock to the most suitable areas whenever such choice of pasture is available, otherwise all adult cattle may be taken to the same place for grazing. During times of pasture scarcity, the male youth may move several hundred of kilometres away from home and stay there for months. In Borana community, this system of moving with animals far from home is referred to as “*fora*” and is exclusive to male youth. Women on the other hand are responsible for the calves, sick adults and sometimes lactating cows that need to be milked. This category of livestock is usually retained closer to the homestead, a system commonly referred to as “*Wora*”.

Acquisition of livestock and having decision over them influences gender participation in informal trade. For instance, among the Borana, when a boy child is born he is given a female calf by the father, a practice referred to as “*handura*”. That cow forms the base of the boy’s wealth accumulation. Although the resultant cow belongs to the boy, he is not allowed to dispose it off or separate it from the rest of the herd until he is married. It is hoped that given the cows matures much faster than the boy, his marriage time will come when the boy already has some wealth of his own with which he can take care of his family. The girl child faces a slightly different scenario. She is not given anything at birth but receives a mature cow from the father on the day of her marriage. The mature girl therefore has only one cow at the time of her marriage while the boy may have several at such a time. It is hoped that the girl goes to meet a husband who was given a calf much earlier and now has sufficient wealth for that new family.

Almost all the market operators (buyers, sellers, brokers, drovers, loaders, drivers, care-takers) are mature males. Young boys (approximately 10-16 years) participate in marking bought livestock for identification purposes once the sale has been concluded (Photo 5.7). Each buyer normally has his unique identification mark and preferred colour code. The mark has to be imprinted at a given part say near the hump or forehead and the purpose is to allow accurate identification and separation of one’s cattle from someone else’s in case they mix as they often do. This helps to reduce loss of livestock and the related conflicts among the traders. When present at the market, the household head negotiates the price, receives the sales proceeds and decides what how the money is to be used.

Male youth are also common but there are no female youths involved in livestock trade. Some of the male youths interviewed indicated that they evolve gradually from cattle herding and trekkers to become traders. This may explain why there are no female youths in trade since herding or trekking of animals is almost exclusively a male youth domain. The role of male youth includes: (i) driving the animals to the market, (ii) selling the animal on behalf of the father, (iii) gathering market information on behalf of the father, (iv) decision making on sale and on the utilization of the sales proceeds in consultation with the father. The sales proceeds are mainly used to purchase household goods such as food, clothing and for restocking.

Women’s and girls’ role in informal livestock trade is negligible; they are mostly involved in the sale of animal products, such as milk and milk products (ghee, butter, etc), hides and skins (Photo 5.8). A few women also sell fodder and food to traders as well as livestock-related wares such as ropes and bells. However, in Wajir camel market there is a women group that buys and transports camels to various markets.



Photo 5.7: Role of boys & young men in camel trade; boys marking sold camels



Photo 5.8: Ethiopian women selling milk at Harobarke market in Ethiopia

5.4.7 Estimation of formal livestock trade along selected corridors

Formal livestock trade in the two corridors was estimated from the volume and value of imports and exports for the three countries between 1998 and 2009. However, the estimates in both Tables 5.53

and 5.54 should be treated with caution because in some of the borders (notably Kenya/Ethiopia) most of the transactions are informal.

Table 5.53: Average volume and value of imports of live livestock in Kenya, Ethiopia, Sudan and Egypt (1998-2009)

Country	Camels	Camels	Cattle	Cattle	Goats	Goats	Sheep	Sheep
	Quantity (Head)	Value (1000\$)	Quantity (Head)	Value (1000 \$)	Quantity (Head)	Value (1000 \$)	Quantity (Head)	Value (1000 \$)
Kenya	-	-	97	14	249	23	3	1
Ethiopia	-	-	1,062	249	196	24	408	15
Sudan	-	-	5,525	1670	771	83	15,434	972
Egypt	59,056	17,977	93,944	55,724	840	54	75,570	3,309

Source: Derived from FAOSTAT (2012)

- Denotes missing data

Table 5.54 shows the export volume and values of live livestock from the four countries. As expected, Sudan is the leading exporter of live livestock followed by Ethiopia. Kenya's and Egypt's exports are only marginal.

Table 5.54: Average volume and value of export of live livestock from Kenya, Ethiopia, Sudan and Egypt (1998-2009)

Country	Camels	Camels	Cattle	Cattle	Goats	Goats	Sheep	Sheep
	Quantity (Head)	Value (1000 \$)	Quantity (Head)	Value (1000 \$)	Quantity (Head)	Value (1000 \$)	Quantity (Head)	Value (1000 \$)
Kenya	-	-	887	273	766	24	214	8
Ethiopia	-	-	51,436	12,266	4,812	207	28,029	1,782
Sudan	50,805	13,531	2,744	818	67,202	2,223	1,017,108	88,887
Egypt	12,940	971	5	3	1,550	82	2,464	208

Source: Derived from FAOSTAT (2012)

- denotes missing data

5.4.8 Assessment of implications of formal and informal CBT to efficient water use

Economic theory indicates that countries trade on the basis of their comparative advantage in the production of the traded commodity. In the case of live livestock, livestock to flow from surplus to deficit areas or countries due to their differences in terms of comparative advantage in production. This comparative advantage reflects the efficiency of resource use (in this case, land, labor, water, etc) in the production of livestock in that country and it is captured in the prices paid in various cross-border markets. Thus, Sudan with its 40.7 million TLU of livestock can be said to be the "most" efficient in water use for livestock production compared to the Great Lakes countries (Rwanda, DRC and Burundi - see Table 5.7), while along the study corridor, Egypt is the least efficient in water use in livestock production (with TLU of 4.0). Facilitating cross-border trade (e.g., through the reduction in trade barriers, improving infrastructure, etc) would allow increased flow of livestock from surplus to deficit areas and therefore raise the overall efficiency of water use in the NB countries.

5.4.9 Description of major value chains and main players

a) How the markets function

The following four distinct value chains in live livestock trade were observed:

- (i) Producer (e.g. of cattle in Ethiopia) → Broker/Middleman → Retailers → Consumers (in Nairobi, Kenya)
 - (ii) Producer → Broker/Middleman → Processors (e.g., KMC) → Consumers
 - (iii) Producer → Broker/Middleman → Consumers (Exports) [mainly for sheep and goats]
 - (iv) Producer → Broker/Middleman → Feedlot → Consumers (Exports)
- These value chains can fit into three distinct marketing channels (Figure 5.30).

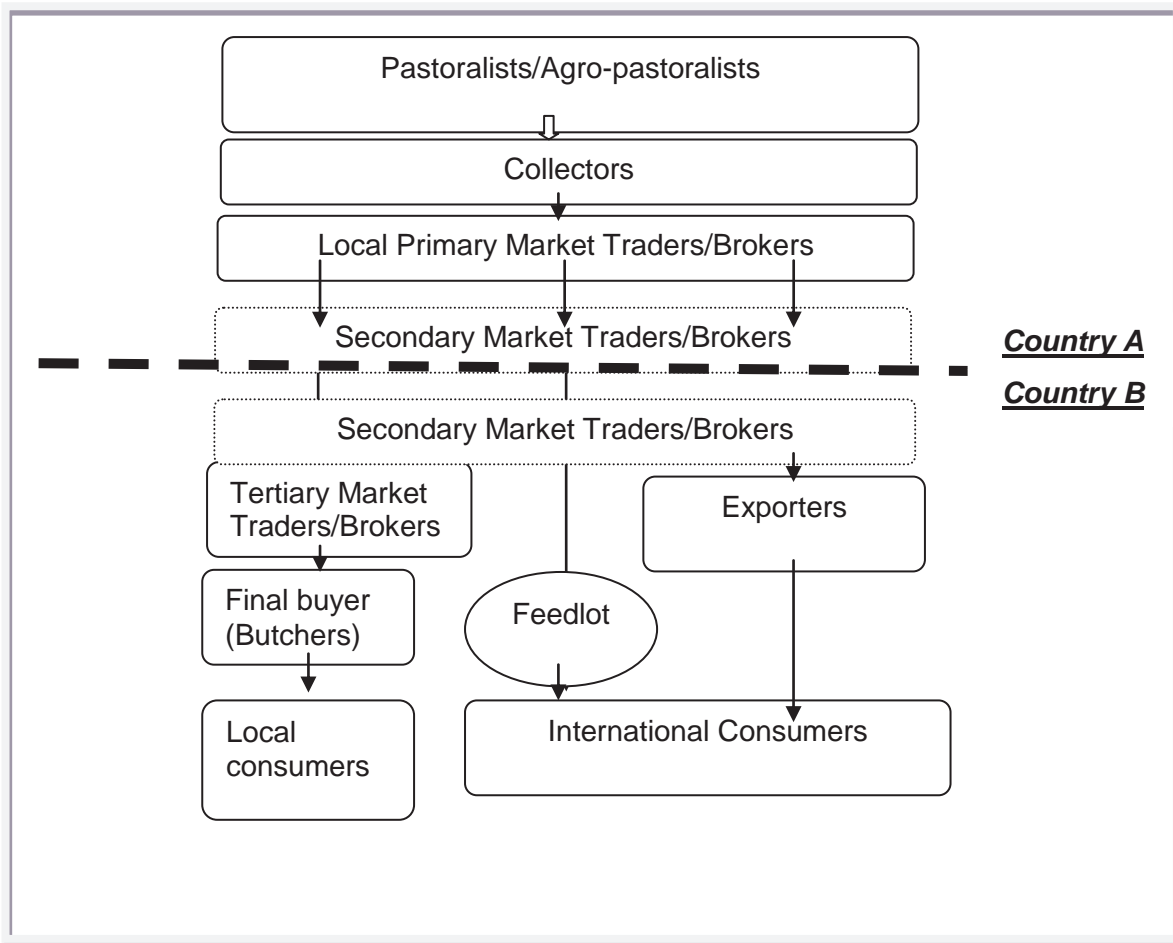


Figure 5.30: Main marketing channels in cross-border live livestock trade in Corridors 1 and 2

The primary producers (pastoralists/agro-pastoralists) mainly sell to primary collectors in the villages (the so-called “bush markets”), who then sell to secondary collectors who deliver the livestock to local primary local markets such as Das, Mega, Madacho, Web, Boribori, Dido and Arero in southern Ethiopia and Gondar in south western Ethiopia (Figure 5.30). Primary markets serve as collection/bulking points for traders who target distant secondary markets that are usually located in strategic areas which may not be well known to producers but which may have adequate pasture and water resources to sustain livestock on their way to and/or from the market. From there, the local primary markets traders/brokers purchase the animals for sale in secondary markets such as Dubluq,

Harobake, Elwaye and Taltal in Ethiopia; El Obeid, Khartoum, Wadi Halfa and Kassala in Sudan and Moyale and Garissa in Kenya.

In the secondary markets the secondary market traders/brokers purchase the animals and take them across the border either on hoof or by truck. It is worth noting that secondary markets can be on both sides of the border (see the dotted 'Secondary Market Traders/Brokers' in Figure 5.8) and that they usually serve a number of key production areas. Across the border, animals are sold in tertiary markets located in major consumption areas (e.g., Nairobi, Mombasa, Addis Ababa and Cairo) to tertiary market traders/brokers, who then sell to final buyers, who can be either butchers or individual consumers. Small producers tend to limit themselves to bush and primary markets that do not require a lot of resources in terms of capital to hire means of transport while medium and large producers may as well avoid the bush and primary markets and deliver their stock to distant but more lucrative secondary and tertiary markets.

Exporters on the other hand purchase animals from secondary markets such as Garissa in Kenya and Harobake in Ethiopia and either export them straight away (e.g., in the case of sheep and goats) or take them to feedlots such as those in Nazaret (Ethiopia) or Taita County (Kenya). From there, the animals are sold in international markets such as those in the Gulf countries (in the case of Sudan and Ethiopia) or Mauritius (in the case of Kenya).

b) Description of the main market actors

The livestock involved in cross-border trade in the two corridors are raised in pastoral and agro-pastoral production systems in the Horn of Africa. This vast region is largely semi-arid to arid, with variable rainfall and a fragile ecosystem, making crop production a difficult and marginal activity, but favouring nomadic¹⁸ livestock production based on natural pasture. Depending on the level of aridity, pastoralists rear different livestock species, with camels being more predominant in more arid areas such as northern Kenya (Mandera and Wajir), south western (in Darfur region), and north eastern Sudan (around Kassala), and much of rural Egypt. Cattle, goats and sheep are raised in relatively wetter areas compared to camels (e.g., in the Ethiopia highlands and mountain valleys as well as in south eastern Sudan (around the Blue Nile State)).

Although detested by producers and traders, brokers and middlemen perform the critical role of linking producers to local or international markets. The brokers/middlemen control market transactions and also arrange for loading and transportation. The brokers/middlemen are predominantly men who live off the margins availed by price differentials between markets. Some of these actors are themselves producers but who are involved in livestock trade. In the Horn of Africa, cross-border livestock trade is operated under networks bound by common kinship, religion or ethnicity. For example, camel traders in northern Kenya are mostly of Somali origin while in southern Ethiopia, most of the traders belong to the Borana ethnic group.

The main traders in Corridor 1 consist of Kenyans and Ethiopians who are fairly large in their operation targeting at least one lorry of cattle (22-24 head of cattle). Such traders specialize in different categories of livestock intended for different purposes. There are those who are most active during dry season in which they buy emaciated cattle and take them for fattening especially in the Modjo or Nazaret areas of Ethiopia. These are loaded to lorries right at the market and transported straight to Nazaret (about 510 km away) taking approximately ten hours. The second type of traders buy and take to Moyale Kenya for resale to Kenyan traders while the last type buys livestock, trek them to Moyale Kenya, load them onto lorries and head straight for Nairobi for slaughter.

¹⁸Nomadism is a pastoralist strategy characterized by the movement of people and their livestock from place to place in search of pasture and water resources (Omiti and Irungu 2002).

Cattle transported to Nairobi are usually of good or at least fair body condition. The main reason behind preference for such animals is that almost 100 percent of them are meant for immediate slaughter so they must be of good condition in order to provide quality meat. The other reason is that given the mode of transport (100 percent lorries), distance (approximately 800km from Moyale to Nairobi) and the very poor road condition, weak cattle may not be able to survive up to the destination and many of them may die en-route causing huge losses to the trader. It therefore doesn't make any economic sense to transport cattle with poor body condition to Nairobi or other tertiary markets that use lorries as the main mode of transport. It is however important to note here that good or poor body condition is relative depending on whether it is during drought with very little water and pasture or during the wet seasons with plenty of pasture and water. During wet season, supply of livestock is usually low across all the markets with prices going quite high.

Drovers, trekkers, loaders and transporters facilitate the movement of livestock from one market to another. Some of the main transporters (lorry owners) reside in capital cities and operate through their brokers via mobile phones. The other actors include feed sellers (especially in Sudan and Ethiopia) and government agents who collect local taxes (cess) and regulate livestock movement using various certifications (for vaccination in Sudan or movement permit in Kenya).

c) Seasonality effects

Livestock production in the two corridors is highly dependent on the availability of pasture and water as dictated by prevailing weather conditions. As mentioned earlier, the keeping of different livestock species depends on aridity with camels being kept in more arid areas (e.g. in Sudan and northern Kenya), and cattle, sheep and goats being kept in relatively wetter areas such as the highlands of southern Ethiopia.

For purposes of analysing in-season as off-season livestock production scenarios, the production cycle may be subdivided into three distinct phases:

Drought period

Corridor 1 experiences frequent and long droughts that may take up to three years. This period is characterized by lack of pasture and water. Pastoralists engage in the *fora* kind of livestock management in which they move most of their livestock to distant places where they can access pasture and water leaving behind just a few which may include those that are lactating, sick, too old or too young to go far. Not knowing how long it will take before the moved livestock comes back, pastoralist also leave behind animals which they may want to use for food in the near future. The herders then move to high to medium potential areas commonly inhabited by crop farmers. Some young men who participate in these *fora* indicated that sometimes farmer-pastoralist resource conflicts occur during such periods. Conflicts also occur when the herders enter private ranches such as those in the Coast Province of Kenya.

Due to lack of well developed livestock markets along the livestock trade corridors, some pastoralists intending to sell their livestock may prefer to trek their animals back to pastoralist zones in hope for better prices. But as they are moved to better markets, they once again enter and go through dry lands devoid of water and pasture for several weeks. It for example takes about three weeks to move cattle from Agre Mariam (a hilly greener region) to Harobake market about 200km away. By the time such livestock get to the preferred market, they look emaciated and weak and so fetch low prices. Some pastoralists therefore decide to sell their livestock at the nearest primary or even "bush markets" located in areas where they migrated to. Most of the buyers in such markets are large traders who operate through their agents and a large percentage of livestock acquired through this mode are usually sent straight to tertiary markets using lorries. This tends to deny production area markets sufficient supply of livestock for trading. It is therefore common to hear small traders at the market

complaining that almost all livestock died due to drought thus the limited supply. It is also worth noting here that most of the livestock that hit secondary markets in such periods are not suitable for high quality meat. This is largely an off-season period for both traders and producers with very limited supply.

Wet season

Wet season is a relatively short period of about three months from the first day of rain. The month following the rains is usually characterized by availability of plenty of water but not much pasture since grass and other forms of vegetation would just be beginning to grow. This is a very important period in livestock production cycle. It signifies a brighter future for the herders who have livestock even if such livestock are emaciated at that particular time. The period derives its trade significance from the fact that it forms the point of intersection between increased demand especially from small traders and decreased supply from herders. This has a lot of influence of livestock prices in the corridor. It is a period celebrated by the “big traders” who may have had the resources to take their business stock for fattening much earlier when it was too expensive for the smaller traders. It takes about Ksh 40,000 per month to sustain a herd of about 200 head of cattle in the grazing areas far from home. During this period, markets experience very little activity. Most of the livestock available for sale are from traders moving from fattening regions e.g., Surupa, Agre Mariam (Nazaret). The period also is characterized by the movement of producers’ cattle from distant areas back home. Towards the end of the three months, most producers arrive home with fairly healthy animals (but do not flood the market since selling livestock is not their main objective).

According to elderly and more experienced pastoralists, rains would be gone by this time but water would still be available in most areas. Pasture would also be at appropriate stage of maturity for animal feed. Fattening therefore continues closer home in a less costly way. Grazing is done relatively near the highway or major roads along which major secondary markets such as Harobake, Dubluq and Elwaye are based. Livestock that hit the market are of better body condition though fewer in numbers. The end of the wet season is largely a transition period in which the early part experiences very low supply and high demand while later parts experience moderate demand and moderate supply.

Post-rain season

This forms the main season both for the livestock traders and producers. The period may be viewed as falling between the end of rains marking the drying off of water sources and complete loss of pasture. It is the period when there is good quality livestock for trade as a result of the good pasture. With most livestock now within the production area, nearby primary and secondary markets receive sufficient supplies from both producers and primary middle men who buy from bush markets/producers.

Although one would expect the lengthy wet/rainy periods to be considered part of the “in-season” period, both herders and traders contend that livestock add more weight during dry than wet seasons. According to ranch managers, the animal’s weight improves greatly by alternating between shady and open grazing areas on a daily basis. It is believed that shaded pasture provides a higher nutritive value whereas open pasture has higher fibre content: both feeding regimes are necessary for faster growth. Livestock fed alternately on the two types of pasture would therefore perform better than those fed exclusively on either of the types. Nutritional analysis may however be necessary to shed more light on this assertion. Traders further argue that it is much easier to estimate the carcass weight of live animals during this period than it is either during very dry or wet season. One fairly young trader with only six years of experience did indicate that during the post rainy season, he is able to estimate carcass weight with an accuracy of ± 5 kg for almost all the animals he buys. The error may be as high as ± 30 kg during the rainy or the very dry periods.

d) Description of trade methods used by small and large traders

In Corridor 1, there are two main avenues through which producers may dispose of their livestock and receive payment. The first is one involves the producer going to the market or circulating word to other producers or brokers of his intention to sell livestock. This is basically a supply-push kind of marketing and is mainly common in the “bush” markets, which may not necessarily be a specific place where buyers and sellers meet but the mere presence of willing buyers and sellers in some production area. The second avenue is where the buyer who may be a “collector” or his agent goes to the potential sellers in villages soliciting for animals. In this case, the buyer may have predetermined quality which must be met by potential suppliers. Producers willing to dispose livestock of the desired quality will therefore avail the livestock for sale.

It is important to note that in most cases, players who meet producers are brokers who may not have capital other than their knowledge of market forces. Most of such brokers take animals on credit and only pay the producers after they (brokers) have sold the livestock further in the marketing channel. There are cases where producers or their representatives may have to move from one market to the other, or visit the same market several times as they wait for the broker to sell the stock, pay them (producers) what they agreed and pocket the balance. There are numerous cases where producers lose money to brokers/middlemen by selling their livestock on credit. However, the kinship/ethnic affiliation tends to mitigate this.

Another common way of accessing buyers is through the formal markets usually manned by the local administration. These are well organized market places which may in some cases have a perimeter wall and have well known market days and operating time. The local administration collects fees (cess) levied on every animal sold (see Table 5.52 for different types of taxes levied per animal in markets in southern Ethiopia). It is also possible to have inter-producer exchange of livestock for money: sales occurring between one producer and another within the production area without the involvement of brokers or other market players.

e) Gender and youth mainstreaming

There is a clear division of labor along the value chains based on the prevailing culture of the communities along the livestock corridors. For instance, men are involved in decision making at production and marketing levels while male youth are involved in production (herding), transportation (trekking) and marketing of live livestock. Young boys (approximately 10-16 years) participate in marking bought livestock for identification purposes once the sale has been concluded. Except for the camel women group in Wajir, women play little role in livestock marketing. However, they participate in production (herding and nursing sick animals, milking, etc), and sale of livestock products such as hides, skins, milk and ghee. Probably educating communities on the importance of increasing women’s role in livestock trade could increase women participation. However, the strong cultural orientations of the communities in the corridor need to be addressed.

5.4.10 Assessment of trade and investment challenges

a) National and cross-border trade and investment opportunities

Enormous cross-border trade opportunities exist along the two live livestock corridors as the demand for livestock and livestock products continue to grow in major cities in Africa and which Delgado et al (2001) refer to as the ‘Livestock Revolution’. For communities living along the two corridors, the following opportunities exist:

(i) Sale of livestock – the demand for livestock and livestock products is rising owing to the rise in population, incomes and urbanization inside and outside Africa. If communities in the livestock

corridors knew this, they would increase production and therefore supply of livestock to meet the growing demand.

(ii) Sale of livestock feed – livestock feed along the market routes is very limiting especially in the drier parts of northern Kenya, Sudan and Egypt such that animals loose condition as a result of travelling long distances with little or no feed. Commercial production (e.g., through irrigation as is presently done in Egypt) and supply of fodder along the corridors would go a long way in reducing this constraint.

(iii) Distribution of water – similar to lack of feed, water is another major constraint which can be addressed in a similar manner.

(iv) Value addition e.g., though feedlots – for people wishing to participate in international livestock trade, feedlots would serve to meet the body requirements of importers. A major constraint for small-scale producers would be their ability to mobilize the capital required to put up feedlots.

b) Main barriers to cross-border movement of the selected commodities

Details of the main barriers to cross-border movement of live livestock are given in Section 5.4.5. In summary, the main barriers include, (i) government regulation, (ii) multiple taxation, (iii) poor road and telecommunication infrastructure, (iv) lack of adequate facilities along the marketing routes, (v) livestock diseases especially foot and mouth disease and contagious bovine pleuropneumonia, which lead to quarantines and restriction in animal movement to and from infected areas/countries, and (v) conflicts/fighting – livestock movement is usually disrupted whenever there is such tension because it becomes too risk for traders and producers to move around with their money or livestock.

c) Highlighting of trade and investment policies in existence that have impacts on trade along the commodity corridors

The main trade and investment policies that impact on live livestock trade include

(i) The Government of Ethiopia still classifies informal cross-border trade as “illegal” trade because it denies the country the much needed foreign currency. This means that traders can be charged for example through confiscation of their livestock or by being fined.

(ii) The Sudanese government is increasingly relying on livestock trade as the main foreign exchange earner following the collapse of its oil sector. This is likely to promote livestock trade. However, multiple taxation and certifications still constrain livestock trade.

(iii) Investment in infrastructure development along the corridor. For example, the Governments of Kenya, Ethiopia and South Sudan intend to construct the Lamu Port-South Sudan-Ethiopia Transport corridor (LAPSSET) which will open up trade (including livestock trade) between the three countries.

(iv) Value addition policy – major livestock producers in the Nile Basin such as Ethiopia, Sudan and Kenya are now pursuing policies that will promote value addition instead of exporting live livestock. Value addition will not only improve producer incomes (a higher share of prices paid by consumers), it will also create employment and improve linkages between the livestock sector and other sectors of the economy through multiplier effects. In the short run, value chain players currently dependent on live livestock trade may lose but in the long run, here will be improvements in livestock productivity and the country as a whole will gain.

d) Roles for different agencies and policy reforms needed to expand investments and intraregional trade

The agencies likely to be play important roles in the trade investments and policy reforms are governments, commodity groups and RECs. Governments in the region could play the following roles to enhance intra-regional trade in live livestock:

- (i) Provide an enabling environment for the private sector to invest, e.g., through the provision of “public goods” such as roads, market infrastructure, security, etc. This will enable traders, processors and other value chain actors to invest in the livestock value chain activities such as construction of abattoirs, investment in appropriate transport facilities, etc.
- (ii) Develop an intra-regional livestock trade policy to deal with issues in livestock trade such as taxation, synchronization of quarantines and animal health interventions, common external tariffs, etc.
- (iii) Build the capacity of producers (pastoralists and agro-pastoralists) to adopt appropriate livestock production technologies, as well as in providing them with marketing information.
- (iv) Assist in restocking of livestock to enhance recovery following devastating natural calamities such as a severe drought.

RECs have a major role to play in (i) building the capacities of various value chain actors in livestock production and marketing, (ii) coordinating and facilitating intra-government policy livestock trade initiatives, and (iii) persuading governments to adopt peer review mechanisms which would enable them be accountable to any commitment made in the promotion of livestock production and trade.

In order to expand investment in intraregional live livestock trade, the following policies are suggested:

- (i) Review of livestock tax regimes and practices – currently, most governments have multiple taxes, which overburdens the value chain actors
- (ii) Credit policy – in most countries, livestock producers and traders are often seen to be risky in terms of their operation and are therefore unable to access credit. This constraints their size of operation and therefore limits the return to investment. Deliberate policy to assist particularly the producers would increase livestock supply and therefore trade.
- (iii) Regional investment in infrastructure – as exemplified by the LAPSSSET, governments in the region should come up with broad-based policies to invest collectively in their infrastructure to enhance regional trade.
- (iv) Creation of economic zones – although the four countries (Kenya, Ethiopia, Sudan and Egypt) are members of COMESA, movement of people and goods is restricted as one is required to have various visas and certifications. Creation of a regional economic zone where rules are streamlined and minimized would enhance intraregional trade.

5.4.11 Estimation of marketing costs along the livestock corridors

5.4.11.1 Storage Activities

Storage infrastructure and losses

Though is an important component of trade, storage plays a relatively less significant role in the informal livestock trade that characterizes most pastoralist regions of the Nile Basin. This is especially so where the main commodity under consideration is live livestock as opposed to livestock products. In production areas, there is a very thin line (if any) between storage and production because what goes to the market is usually part of the breeding stock for which very little can be said regarding storage.

Some forms of storage however begin to emerge as one moves down the chain. Traders tend to have access to some form of “communal” holding grounds or private temporary enclosures within which such traders may keep animals as they await disposal. This could take the form of a circular perimeter

fence consisting of dry thorny tree branches. The study found that only 15.2 percent of traders in Corridor 1 have some form of storage for their livestock. Out of these, 26.7 percent are camel traders while 73.3 percent are cattle traders. There was no informal small stock (sheep and goats) respondent who confirmed having a storage facility.

Formal traders however tend to have more advanced facilities that may have regular supply of clean water and paddocks used for separating groups of livestock that are at different stages of preparation for the market. The common structures at the formal trader level constitute barbed wire fences or wooden enclosures. In addition to the temporary structures, there are traders who construct “permanent” walled structures (similar to the one built for camels at Adama in Ethiopia). Despite the efforts, traders still suffer losses during storage due a number of factors. The most common cause of storage losses accounting for about 53percent of the storage related losses is insecurity followed by lack of feed/water and diseases which accounts for 34 percent and 7 percent, respectively (Figure 5.31).

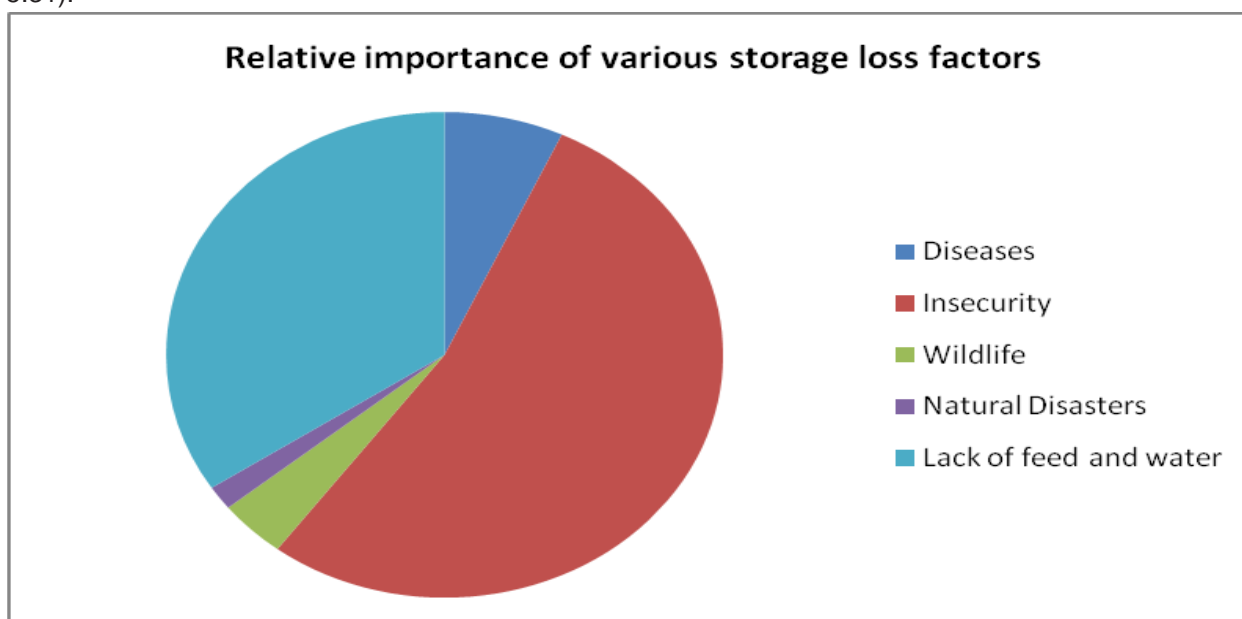


Figure 5.31: Factors influencing storage losses in Corridor 1

On average, a trader has about 106 head passing through his storage facility each month. Of these, about two animals (or 1.9 percent) may be lost due to one or more of the causes mentioned above every month. Though insecurity accounts for much of the storage losses, it doesn't affect as many traders as does lack of feed and water. In terms of number of respondents affected, 56percent of the respondents who have suffered storage loss have been affected by lack of feeds and water as compared to 31 percent who have been affected by insecurity, yet insecurity accounts for 53 percent of the losses. The discrepancy arises from the fact that though fewer people have been affected by insecurity, the losses to the victim may be as high as 100 percent of the held stock as it happens in most cases of cattle rustling.

Capital Costs

The cost of permanent storage facility for cattle costs an average of Ksh 50,000 while a temporary one costs about Ksh 10,000. For those who rent, the costs average to Ksh 150 per head per month. Labour on the other hand is charged at an average rate of Ksh 15 per head per day. It further emerged that traders who use slaughterhouse grounds which are usually government or community owned are not charged. Such traders only pay their caretakers. Given the cost implications and flexibility in terms of capacity, a temporary structure would be more cost effective for small scale livestock dealers because it may be expanded in size and can use locally available materials such as tree branches to do the fencing.

Organization, management and ownership of storage infrastructure

There are three main sources of storage facilities in the livestock corridor: traders may construct their own, rent or use government/communal facilities. The proportionate importance of the various sources of storage is shown in Figure 5.32, which indicates that 36percent of traders who store livestock use their own facilities, another 36 percent uses government or communal holding grounds while 27 percent rent.



Figure 5.32: Ownership and management of storage facilities

Cost differences between formal and informal trade channels

Whereas informal trade storage structures may cost less than Ksh 10,000 to put up, formal export oriented structures such as the Modjo Export facilities cost much higher to put up. The Modjo Small stock facility above is said to have cost about Ksh 250,000. Unlike in the informal trade where labour is usually billed per head per day, most for formal traders have regular employees paid per month. The monthly labour bill for the Siyum Balcha farm whose capacity is about 1000 heads amounts to 9500 birr (Approximately Ksh 47,500).

5.4.11.2 Transport Infrastructure Costs

Prevalent modes of transport and their costs

There are three main modes of transporting livestock depending on the stage along the production chain. Trekking is almost if not the only form of transport at the producer stage. This is exclusively handled by male youth and may cover several kilometers taking several days. Trekking is also prevalent between primary and secondary markets after which road trucking (using 24 or 45 cattle head capacity trucks) takes over almost exclusively as the stock heads to the tertiary markets. Stock bought by herders for restocking may, however, be trekked to the various production zones. Livestock sold to external markets are on the other hand shipped through Indian Ocean, the Red Sea or other water bodies around the Nile basin.

Cost of transport depends on a number of factors including mode of transport, volumes per delivery, status of the road and distance to be covered. Trekking was found to be the most stable and probably the cheapest mode of transport especially with regard to financial costs. Trekking distances of about 110 km are charged an average of Ksh 337 per head of cattle, translating to about Ksh 3 per km per head.

Trucking on the other hand is quite unstable and under the influence of many factors. Common factors that influence cost of trucking include status of the road, capacity of the vehicle and distance to be covered. In general the bigger the capacity the lower the rate while the shorter the distance the higher the rate. This multiplicity of factors has created a wide range in trucking costs spreading from Ksh 1.25 per head per km to Ksh 5.33 per head per km. On average however, the cost of hiring a truck in the region is about Ksh 2.78 per head per km. It is however important to note here that in addition to the cost of hiring the vehicle, livestock is transported at traders risk and so he/she has to ensure that stock is well taken care of by hiring and paying for animal handlers who ensure safety of livestock during transit. The trader also pays for the loaders and any other transit expenses such as bribery along the road. Fuel and repairs are met by owner of the vehicle.

On average loading costs amount to Ksh 700 per trip while caretaking while on transit for a distance of about 400km cost Ksh 3500 plus meals of Ksh 1,000. Bribery per trip takes an average of Ksh 2,050 and doesn't depend on number of livestock carried. Trucking therefore attracts an additional Ksh 7,250 per trip.

5.4.11.3 Costs of Domestic NTBs

Common non-tariff trade barriers (NTBs) in the livestock corridors

The most common NTBs in the region include internal and cross-border insecurity, police harassment and poor roads. Difference in veterinary regulatory systems across-borders is another important NTB. On average, losses related to insecurity account for about 32 percent of post harvest losses while damage during transit associated with poor roads account for 40 percent of post harvest losses in a normal month. Moving livestock on truck from say Garissa to Nairobi may cost up to Ksh 5000 in bribes to the police, a problem that is usually compounded by the poor state of roads which may lead to delays hence need to travel at night in order to reach the destination within the stipulated 24hours. Travelling at night is prohibited in Kenya and if found a traders is either required to part with fat bribe or be taken to court. Poor roads also damage the trucks thereby increasing the risk of making such trucks to be considered un-road worthy for example after losing one of the lamps. This makes such a truck even more attractive to authorities seeking bribery.

Most of the NTBs in the livestock corridor affect formal and informal traders almost equally since necessary regulatory paper work doesn't guarantee a trader an escape from insecurity or police harassment. Some parts of the informal trade channel that use trekking rather than trucking may however avoid police since they use routes usually not manned by police. Such routes may save them an average of Ksh 2050 that goes to bribery of police on each trip. Trekking, a key characteristic of informal traders may also save such traders from the negative effects of poor roads since the mode is not as susceptible to status of the road as is trucking.

6.0 Informal and Formal Trade

6.1 Estimates of informal cross-border trade along the corridors

The informal trade data was collected along all the different borders of Kenya, Uganda, Rwanda, Burundi, Tanzania, DR Congo, and Southern Sudan where corridor analysis was done (see Maps in Section 5.0). In these border points, monitors were recruited and positioned at different routes, including the custom area, to collect trade data and commodity flow directions on any unofficial movement of maize, beans, rice, Irish potatoes, pineapples, passion fruits and bananas for a period of two months. The recorded data was then entered into excel sheets according to the respective border points. The total trade volumes per commodity as well as the values for the two months were then calculated.

The annual trade for 2011 was projected by using secondary data on informal trade from FEWSNET. Using data from the same months, the percentage difference between volumes of the monitored data and those of FEWSNET was estimated. It was found that the study had recorded lower volumes than FEWSNET almost in all border points probably because of the differences in monitoring methods. The study's method particularly emphasized on close supervision and correct estimation of volumes. Further, monitoring was done for all the days from 6.0 am to 6.0 pm even in markets where informal trade thrived at night.

It was assumed that percentage difference from the FEWSNET data will remain constant for all the months. This assumption enabled the study to estimate volume for months that were not monitored in 2011. In cases where there was no secondary data on informal trade, the study considered seasonality of commodity production throughout the year to project trade in the months that were not monitored. Qualitative information from the traders was used for this purpose. The total informal trade between two countries was arrived at by summing up the trade volumes for the different border points along the study corridor.

The border with the highest volumes of informal trade of the monitored commodities was the Uganda-Kenya border especially in the case of maize and beans. Rice on the other hand was flowing in large quantities from Kenya to Uganda (Table 6.55). The trade flows for the other commodities and between different countries are presented in Tables 6.56- 6.60).

Table 6. 55: Informal trade between Kenya and Uganda (2011)

Commodity	Kenya to Uganda			Uganda to Kenya		
	Metric tons	Price (US\$/ton)	Value US\$	Metric tons	Price (US\$/ton)	Value US\$
Maize	730	400	292,000	67263	370	24,887,310
Beans	91	700	63,700	14191	670	9,507,970
Rice	1440	980	1,411,200	304	1030	313,120
Bananas	164	290	47560	2198	280	615,440
Passion fruits	240	570	136800	27	680	18360
Irish potatoes	1139	260	296140	374	300	112200
Pineapples	4	830	3320	323	650	209950

Table 6.56: Informal trade between Uganda and Rwanda (2011)

Commodity	Uganda to Rwanda			Rwanda to Uganda		
	Metric tons	Price (US\$/ton)	Value US\$	Metric tons	Price (USD/ ton)	Value US\$
Maize	1074	400	429,600	4	300	1,200
Beans	629	470	295,630	11	500	5,500
Rice	123	1000	123,000	2	1100	2200
Bananas	1125	270	303,750	135	330	44,550
Passion fruits	96	500	48000	39	500	19500
Pineapples	54	380	20520	9	450	4050
Irish potatoes	2130	220	468,600	128	260	33,280

Table 6.57: Informal trade between Rwanda and Burundi (2011)

Commodity	Rwanda to Burundi			Burundi to Rwanda		
	Metric tons	Price (US\$/ton)	Value US\$	Metric tons	Price (US\$/ton)	Value US\$
Maize	0	0	0	0	0	0
Beans	3	850	2550	12	500	6000
Bananas	1	230	230	28	200	5600
Passion fruits	0		0	18	350	6300
Irish potatoes	5	260	1300	2	280	560
Pineapples	3	500	1500	17	450	7650
Rice	0		0	2	870	1740

Table 6.58: Informal trade between Uganda and DRC (2011)

Commodity	Uganda to DRC			DR C to Uganda		
	Metric tones	Price (US\$/ton)	Value US\$	Metric tons	Price (US\$/ton)	Value US\$
Maize	14	280	3920	526	220	115720
Beans	44	500	22000	788	500	394000
Bananas	18	250	4500	22,125	210	4,646,250
Passion fruits	0.3	800	240	0.7	500	350
Irish potatoes	29	300	8700	1029	270	277830
Pineapples	7	400	2800	0.3	600	180
Rice	2	1200	2400	9	1060	9540

Table 6.59: Informal trade between Tanzania and Burundi (2011)

Commodity	Tanzania to Burundi			Tanzania to Kenya		
	Metric tones	Price (US\$/ton)	Value US\$	Metric ton	Price (US\$/ton)	Value
Maize	221	300	66300	252	300	75600
Beans	4	800	3200	0		0
Rice	13	1000	13000	3	900	2250

Table 6.60: Informal trade between Uganda and South Sudan (2011)

Commodity	Uganda to South Sudan		
	Metric tons	Price (US\$/ton)	Value US\$
Maize	334	600	200400
Beans	154	800	123200
Rice	46	1000	46000
Bananas	4350	700	3,045,000
Passion fruits	4	600	2400
Irish potatoes	7	350	2450
Pineapples	66	400	26400

6.2 Estimates of formal cross-border trade along the corridors

In all countries maize had the highest value of formal trade accounting for 46 percent (US\$ 97,989,972) of the total value of all the traded commodities along the corridors (Figure 6.33). This is followed by pulses (beans) which account for 30 percent (US\$ 63,647,994), 22 percent for rice (US\$ 46,679,325) and fruits and vegetables (pineapples, Irish potatoes and bananas) accounting for 3 percent (US\$ 5,470,110). Pineapple has the least value of US\$ 1,114,008.

The above trend is mirrored in terms of quantities (in mt) with slight differences: bananas are the least traded in terms of weight (Table 6.61). Uganda and Tanzania were the key sources of the commodities traded in the corridors, while the main importing countries were Kenya, Rwanda and Sudan (Table 6.62).

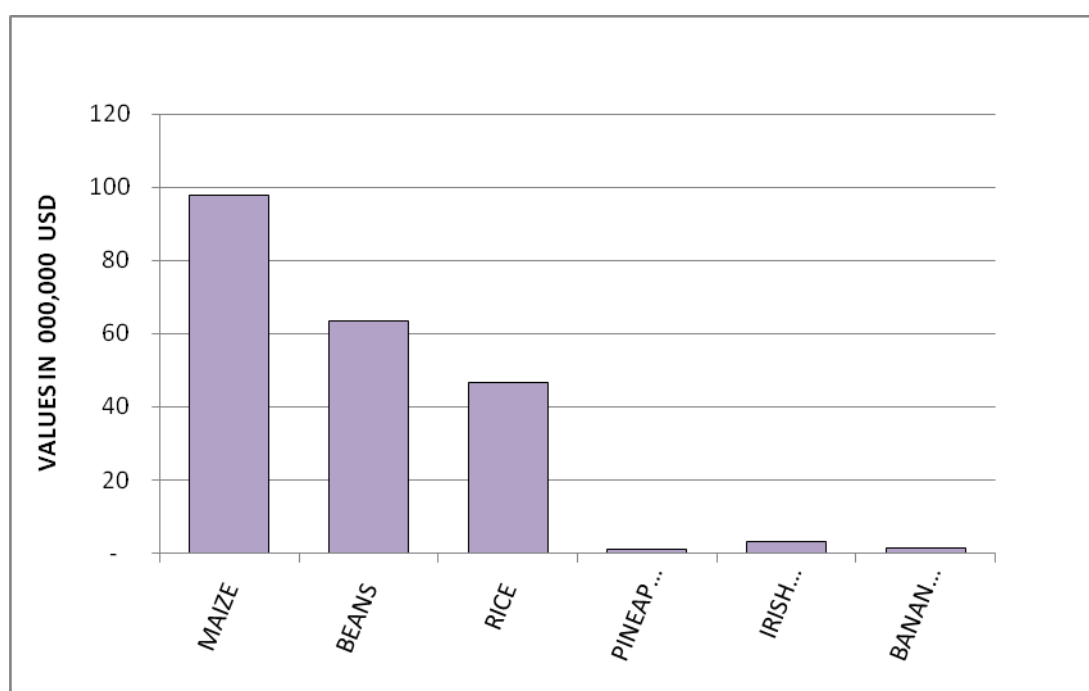


Figure 6.33: Proportion of formal trade in US\$ of food commodities between 2006 and 2011

Overall, the Uganda and Kenya borders are the most active since they record the highest volume of cross-border trade, cumulatively accounting for 45 percent. This is followed closely by the Uganda and Rwanda border which accounts for 28 percent of cross-border trade. The least active border is between Burundi and Rwanda (1 percent) while Burundi and Sudan have very little or no exports to Tanzania and Uganda, respectively (Figure 6.34).

Table 6.61: Volume of commodities traded along the study corridors (mt)

Border	Kenya - Uganda		Rwanda - Burundi		Uganda - Rwanda		Tanzania - Burundi		Kenya - Tanzania		Sudan - Uganda		Commodity Total (mt)
	Kenya/ Uganda	Uganda/ Kenya	Burundi/ Rwanda	Rwanda/ Burundi	Rwanda/ Uganda	Uganda/ Rwanda	Burundi/ Tanzania	Tanzania/ Burundi	Kenya/ Tanzania	Uganda/ Sudan	Sudan/ Uganda		
Direction of flow	Year												
Maize	2006	654	23679	**	10	**	2000	817	**	779	665	8,122	**
	2007	324	29345	**	**	**	61178	480	**	1,479	37832	1,481	**
	2008	585	35225	544	62	54	10669	3500	**	2,102	7,849	16,168	**
	2009	906	14487	580	**	149	26933	**	**	1,048	100	15,593	**
	2010	216	54494	**	198	**	50654	194	**	3,364	1000	17,892	**
	2011	220*	51786*	581	134	789	68,353*	100*	**	80	1012	13,682*	**
Beans	2006	3	15248	**	251	**	**	**	**	136	**	5,024	**
	2007	6	67545	**	17	**	5227	**	**	700	300	395	**
	2008	15	26761	4	1,648	280	836	18	**	**	948	75	**
	2009	9	36370	106	**	630	77	**	**	108	5712	168	**
	2010	56	31090	**	502	250	**	414	**	354	3516	574	**
	2011	69*	27049*	20	1,840	26	1272	12	**	2	760	481*	**
Rice	2006	541	434	**	25	**	4912	640	**	63	11	3,609	**
	2007	257	261	33	**	**	7927	456	**	450	4095	3,776	**
	2008	278	890	45	63	12	9499	363	**	550	5993	4,272	**
	2009	1,503	921	260	**	26	9372	28	**	350	200	4,604	**
	2010	1,502	2214	576	**	190	1380	1513	**	12	17773	5,930	2
	2011	1,281*	2980*	61	**	405*	6	155	**	1	2622	6,736*	**
P/Apple	2006	**	1285	**	**	**	**	**	**	14	4	**	**
	2007	8	2829	**	**	**	13	**	**	5	720	**	**
	2008	0	2416	**	**	**	0	**	**	3	900	**	**
	2009	0	1910	**	**	**	2	**	**	4	383	**	**
	2010	10	1718	**	**	**	**	**	**	0	350	**	**
	2011	4*	2038*	6	**	**	68	**	**	0*	500	**	**
Irish	2006	82	41	**	201	**	**	33	**	3	**	**	**

Border	Kenya - Uganda		Rwanda- Burundi		Uganda - Rwanda		Tanzania - Burundi		Kenya - Tanzania		Sudan -Uganda		Commodity Total (mt)
	Kenya/ Uganda	Uganda/ Kenya	Burundi/ Rwanda	Rwanda/ Burundi	Rwanda/ Uganda	Uganda/ Rwanda	Tanzania/ Burundi	Burundi/ Tanzania	Kenya/ Tanzania	Tanzania/ Kenya	Uganda/ Sudan	Sudan/ Uganda	
Direction of flow	Year												
Potatoes	2007	620	**	590	**	1490	**	**	**	**	**	**	14401
	2008	505	25	678	**	435	**	**	30	1610	0	**	
	2009	190	11	494	8	1621	**	**	1002	7515	**	**	
	2010	150	6	2,301	**	**	3105	**	200	1000	**	**	
	2011	99*	3*	7,869	840	3277	**	**	100	6800	**	**	
Bananas	2006	**	377	**	**	**	**	**	**	**	0	**	
	2007	**	695	**	**	3823	**	**	**	**	**	**	
	2008	**	283	**	**	2228	**	**	**	**	**	**	
	2009	**	789	**	**	3736	**	**	**	**	2	**	
	2010	**	457	**	**	1	**	**	**	**	**	**	
2011	**	641*	**	**	1369	**	**	**	**	**	**		

Note: *Projected values; ** Unavailable data. Source: UNCOMTRADE

Table 6.62: Formal commodity trade along the study corridors (values in 000 US\$)

Commodity flow	Kenya - Uganda		Rwanda-Burundi		Uganda - Rwanda		Tanzania - Burundi		Kenya - Tanzania		Sudan - Uganda		commodity total value
	Kenya/ Uganda	Uganda /Kenya	Burundi Rwanda	Rwanda/ Burundi	Rwanda/ Uganda	Uganda/ Rwanda	Burundi Tanzania	Tanzania Burundi	Kenya/ Tanzania	Tanzania /Kenya	Uganda /Sudan	Sudan/ Uganda	
Maize	2006	783		0	**	413		39	949	160	2680	**	97,989
	2007	571	**	**	**	5,013	128	128	1,876	3,931	319	**	
	2008	674	44	2	3	1,083	533	533	1,800	1,973	3,769	**	
	2009	1,200	47	**	7	5,079	**	**	1,279	1	5,637	**	
	2010	196	11,622	**	23	4,783	**	28	1,336	75	3,199	**	
	2011	28*	9,734*	53	5	6,276*	63	7*	123	321	3,537*	**	
	2006	2	2,783	**	145	**	**	**	46	**	2,746	**		63,648
2007	1	12,893	**	1	**	4970	**	307	32	153	**		
2008	3	11,418	0	600	206	92	58	**	331	24	**		
2009	8	9,772	10	**	192	9	**	23	1,135	26	**		
2010	22	9,225	**	137	126	**	147	88	635	612	**		
2011	3*	7,969*	3	539	4	136	2	3	219	296*	**		
2006	224	145	**	6	**	1,322	224	39	3	1,129	**	46,679	
2007	318	21	7	**	**	2,250	145	75	2,537	1,076	**		
2008	399	33	12	24	11	3,680	108	85	2,184	1,761	**		
2009	872	94	158	**	11	3,762	17	39	6	2,139	**		
2010	880	2,040	222	**	57	664	520	0	6,812	2,730	1034		
2011	753*	2,637*	16	**	115*	2	18	2	852	3,443*	**		
2006	**	54	**	**	**	**	**	10	3	**	**		**
2007	1	144	**	**	**	0	**	6	64	**	**	**	

Commodity flow	Kenya - Uganda		Rwanda-Burundi		Uganda - Rwanda		Tanzania - Burundi		Kenya - Tanzania		Sudan - Uganda		commodity total value
	Kenya/ Uganda	Uganda /Kenya	Burundi Rwanda	Rwanda/ Burundi	Rwanda/ Uganda	Uganda/ Rwanda	Burundi Tanzania	Tanzania Burundi	Kenya/ Tanzania	Tanzania /Kenya	Uganda /Sudan	Sudan/ Uganda	
2008	0	160	**	**	**	**	0	**	3	83	**	**	
2009	0	155	**	**	**	**	2	**	5	34	**	**	
2010	11	172	**	**	**	**	**	**	0	25	**	**	
2011	2*	144*	**	**	**	**	9	**	2*	34	**	**	
2006	43	0	**	11	**	**	**	4	2	**	**	**	2,986
2007	48	**	**	65	**	**	57	**	**	2	**	**	
2008	29	2	**	58	**	**	206	**	4	120	0	**	
2009	14	0	0	30	**	1	89	**	117	471	**	**	
2010	19*	1*	**	272	**	**	**	34	17	61	**	**	
2011	25*	1*	0	281	**	168	155	**	17	261	**	**	
2006	**	32	**	**	**	**	**	**	**	**	0	**	1,370
2007	**	76	**	**	**	**	361	**	**	**	**	**	
2008	**	37	**	**	**	**	205	**	**	**	**	**	
2009	**	66	**	**	**	**	302	**	**	**	1	**	
2010	**	114	**	**	**	**	0	**	**	**	**	**	
2011	**	72*	**	**	**	**	103	**	**	**	**	**	
	7,40	97,941	574	2,200	961	36,552	2,258	-	8,251	22,362	35,280	1034	213,788
	6												

*Projected values; ** Unavailable data; 0= less than \$1000
 Source: UNCOMTRADE

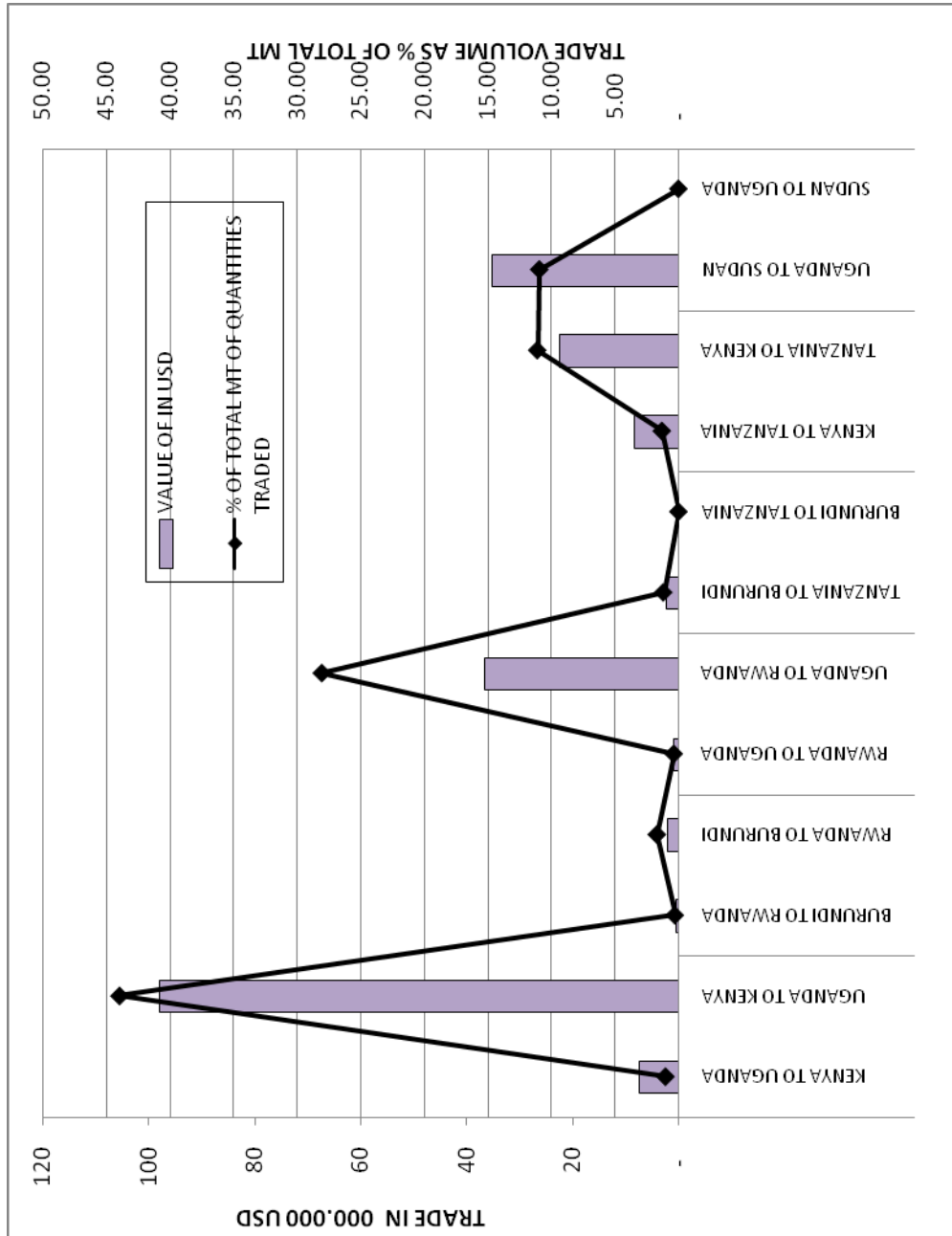


Figure 6.34: Formal trade between countries in terms of US\$ values and proportion of volumes

6.3 Estimates of total cross-border trade along the corridors

In 2011, the Kenya-Uganda border still remained the most active accounting for 51 percent (174,658 mt) of the traded commodities. Most of the trade at this border however flows from Uganda to Kenya with maize as the highest commodity traded (Figure 6.35 and Table 6.63). Uganda and Rwanda border follows closely by accounting for 24 percent of the total trade in metric tons (81,964 mt). The least volume of trade in all the monitored borders was from Kenya to Tanzania (183 mt). There is no known record of trade flow from Burundi to Tanzania, and Sudan to Uganda. The largest flow of Irish potatoes was from Rwanda to Burundi. Bananas on the other hand were mainly from DR Congo to Uganda. A detailed account of other trade flows of the corridor commodities are shown in Table 6.63.

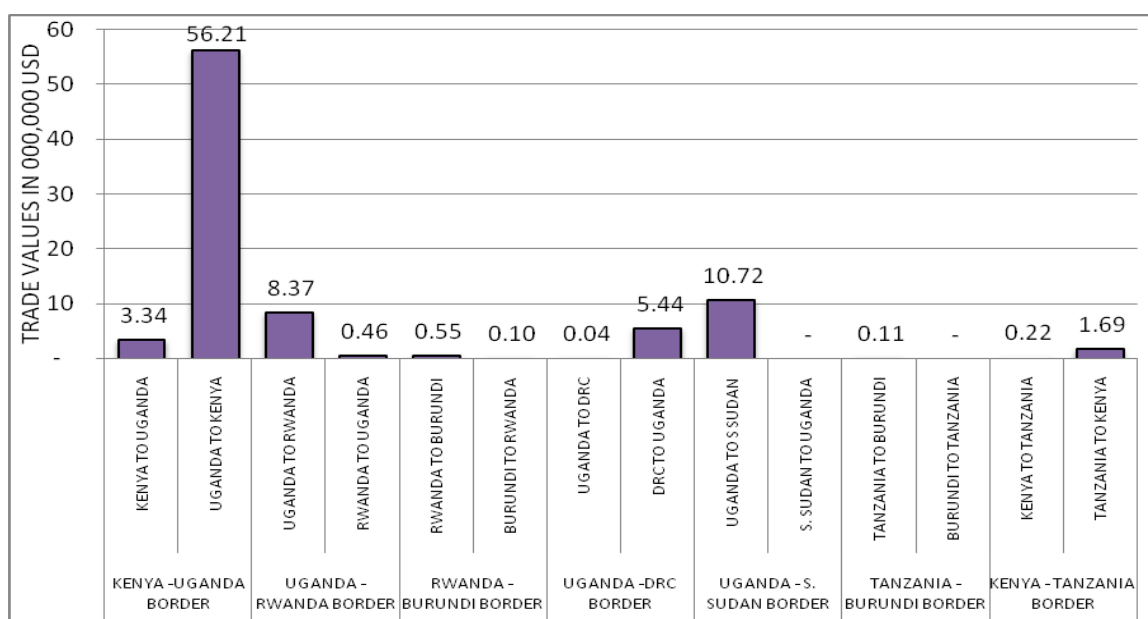


Figure 6.35: Formal and informal trade (combined) values in 2011

In all the corridors it was found that the study commodities were mainly traded informally than formally (Table 6.64). This was especially the case along the DR Congo-Uganda border which recorded 100% informal trade for all the commodities, regardless of the direction of flow (whether from Uganda or DR Congo). Data from the Uganda-South Sudan border showed that trade of vegetables and fruits, which flowed from Uganda to South Sudan, was 100% informal. Similarly, among the commodities flowing from Uganda-Kenya, maize bananas, and pineapples were mainly traded informally, recording 57%, 77%, 99% of informal to total trade, respectively. The major importing countries tended to allow more informal trade than the exporting ones. For instance, the flow of maize, bananas, beans and pineapples from Kenya to Uganda recorded a higher proportion of informal to total trade than the flow of the same commodities from Uganda to Kenya (Table 6.64).

Table 6.63: Breakdown of total commodity trade between countries in 2011

	Kenya - Uganda	Uganda - Kenya	Uganda - Rwanda	Rwanda - Uganda	Rwanda - Burundi	Burundi - Rwanda	Uganda - DR Congo	DR Congo - Uganda	Tanzania - Burundi	Tanzania - Kenya	Kenya - Tanzania	Uganda - Sudan	Burundi - Rwanda	Rwanda - Burundi	TOTAL	percent OF COMMODITIES TRADED BETWEEN BORDERS
Maize	950	119,049	69427	793	134	581	14	526	321	1264	80	14,016	581	134	207870	61.00
Beans	160	41,240	1901	37	1843	32	44	788	16	760	2	635	20	1,840	49318	14.47
Bananas	164	2,839	2494	135	1	28	18	22125				4,350			32154	9.44
Passion	240	27	96	39	0	18	0.3	0.7				4			425	0.12
I/potatoes	1238	377	5407	968	7871	11	29	1029		6800	100	7	6	7,869	31712	9.31
Pineapples	8	2,361	122	9	3	23	7	0.3		500	0		6		3039.3	0.89
Rice	2721	3,284	129	407	0	63	2	9	168	2,625	1	6,782	61		16252	4.77
TOTAL	5481	169177	79576	2388	9852	756	114.3	24478	505	11949	183	25794	674	9843	340770	
TOTAL Trade between country pairs	174,658		81,964		10,608		24,592		505		12,132		10,517			
percent of trade between countries	51		24		3		7		0		4		8			3

Table 6.64: Percent (%) of informal trade to total trade for selected commodities in 2011

Commodity	Kenya- Uganda	Uganda-Kenya	Rwanda- Uganda	Uganda- Rwanda	Rwanda- Burundi	Burundi- Rwanda	Uganda- DRC	DRC- Uganda	Tanzania- Burundi	Tanzania- Kenya	Uganda- South Sudan
Maize	77	57	1	2	0	0	100	100	69	20	2
Beans	57	34	30	33	0	38	100	100	25	0	24
Rice	53	9	0	95	0	3	100	100	8	0	1
Bananas	100	77	100	45	100	100	100	100	-	-	100
Passion fruits	19	100	100	100	0	100	100	100	-	-	100
Irish potatoes	92	99	13	39	0	18	100	100	-	-	100
Pineapples	50	14	100	44	100	74	100	100	-	-	100
<i>Total</i>	69	50	14	7	0	10	100	100	-	-	19

Note: 100% implies that there is no formal trade data

6.4 Barriers to Trade

6.4.1 Tariff Barriers

There are four border points from Uganda to Kenya in the trade of beans, potatoes, maize and fruits and vegetables. They include Suam in Kapchorwa, Lwakhakha in Mbale, Malaba in Tororo and Busia border. Several tariff barriers along this border are experienced which makes it very costly to trade formally. For a trader to engage in trading in beans from Uganda to Kenya she/he is required to have a plant import permit, phytosanitary certificate and a letter of request for exportation. On the Kenyan side, the trader needs a phytosanitary certificate to confirm that the consignment has been inspected from the country of origin and payment for an import duty fee. These requirements not only increase transactions costs and prices ultimately paid by consumers, they also lead to evasion of formal export channels.

Along Rwanda-Congo border, traders claim that the taxes are too high and that this is what drives them to fraudulent practices. In order to conform to the East African Community tax rates, the Rwanda Revenue Authority had to increase taxes for fruits, vegetables, cereals and animal products from 15 percent to 25 percent. This has exacerbated the situation that was already bad. In 2011 Tanzania government banned the export of maize with the aim of ensuring food security for its people. However, this move generated a far reaching effect in the region where commodity prices were distorted and farmers in Tanzania ended up incurring high losses due to low market prices and post-harvest losses. When the ban was finally lifted and again re-imposed, there was a lot of confusion even to Tanzanian agencies at various border points. At the time of the survey, the ban was supposed to have been lifted but this was only on paper; on the ground, there were reports that the agencies at various border points were still restricting transit of maize from Tanzania.

6.4.2 Non-tariff trade barriers

Several non-tariff barriers (NTBs) continue to persist in the Nile Basin despite efforts of the regional economic corporations (RECs) aimed at fast-tracking customs unions. The NTBs comprise a wide range of trade policy practices applied by governments, whose main aim is usually to restrict trade flows in order to achieve specific aims such as protection of infant industry, reduction in domestic supply of a staple foodstuff such as maize, or consumer protection. The main convenience of NTBs is that they can be imposed and removed simply through gazette notices or through executive pronouncements and their contestations for example from those who stand to lose (either within the country or from trading partners) is quite often futile as the strategies can readily be justified from the point of view of the country imposing them or they can easily be disguised. Furthermore, NTBs, as demonstrated below, can arise from unofficial actions of public officials (due to inefficiency or corruption in administration of customs duties) or from the state of technology (e.g. inability to innovate in terms of telecommunication and management and information systems) or simply due to poor roads and marketing infrastructure. Due to these characteristics of NTBs their existence can easily defy the efforts aimed at freeing cross-border trade and this is proving to be a major challenge for policy makers and small traders who often lack the clout necessary for seeking redress for the implied high transactions costs and reduced gains from trade. We summarise below some of the typical NTBs in the Nile Basin, including the most affected commodities and borders, and in the next sub-section present what they mean in terms costs.

a) Physical infrastructure

These relate to the road network that cost traders and transporters in terms of delays (lengthy transit times), breakdown in trucks, limited service providers for the different modes of transport (rail, road, water and air) that cause monopolistic tendencies and hence high charges. The following specific incidences were noted during the survey:

- Poor road infrastructure and movement restrictions for beans traders by a river along the Kenya-Uganda border at Lwakhakha and Malaba border points; the same problems are experienced for trade in bananas, beans and rice at Mpondwe market along Uganda-Democratic Republic of Congo border whenever river Mpondwe overflows
- Poor market infrastructure affects trade most of the border sites but the situations at Mpondwe, Nimule-Bibia along the Uganda/South Sudan border were particularly bad. The markets lack trading shades/stalls and storage facilities forcing traders to operate in the open air which exposes the commodities to bad weather conditions.
- Traders dealing with maize, beans and rice at the Nimule-Bibia market are also constrained by the poor customs infrastructure on the South Sudan side
- Lack of modern data management and communication systems and poor networking with head offices was a problem experienced at literally all the customs points. In cases where modern facilities are available (like at Busia and Malaba), frequent power failure often disrupts operations and efficiency in their use. Consequently officials revert to manual means of inspection, data entry, and verification that opens avenues for time wastage and rent seeking habits. Also lack of sheltered areas where inspection of goods can be done exposes traders to weather related liabilities.
- All the border points lacked facilities for storage or holding grounds for livestock

b) Administrative procedures

Procedures employed to administer trade policies and regulations in themselves constitute impediments to trade, notwithstanding their necessity. Administration costs usually arise from the following trade requirements: import declaration form (IDF); pre-shipment inspection (PSI); customs clearance procedures; clearing and forwarding services; and, trade administration and regulation institutions (e.g. plant inspectorates, police checks on contrabands, drugs and illegal firearms).

- Along Uganda-Kenya there are many non tariff trade barriers experienced. For example, at Busia and Malaba border points there are irregular practices for certification and levying of stamp fees which lead to bribery. At the same border points traders are subjected to lengthy documentation procedures for issuing licenses. At Busia border on Uganda side maize traders spend approximately 7 hours on queues. In Kenya they spend an average of 3 hours and in Tanzania approximately 1 hour at customs offices.
- Live livestock is the major commodity traded along Kenya-Ethiopia border and it is mostly if not entirely informal. Trade is considered illegal with very little government support. The informal trade at Moyale on the Ethiopian side is characterized by government crack-downs resulting in confiscation of the livestock. This then affects the traders adversely as they are forced to operate without formal finance and credit
- Although hours for keeping customs offices open have increased considerably since 2000 when the COMESA/FTA came into effect and through initiatives of the EAC/CU (all of which have been advocating for longer working hours), formal traders are still subjected to long waiting periods and queues for trucks awaiting clearance at Malaba and Busia often extend for miles. For perishables and grains, the traders readily resort to the informal channels, and as would be expected added costs arising from increased loading and off-loading and for expenses related to delays, are passed on to consumers. For the land-locked countries, these costs are a major burden and impediment to trade.

c) Non-tariff fees and taxes

The various bodies in charge of cross-border trade levy a number of non-tariff fees on agricultural products. The fees include: value added tax (VAT); pre-shipment inspection fees; warehousing fees; various development levies that are commodity/institution specific (e.g. for sugar, roads, local authorities and Kenya Airports authority in the case of Kenya). In addition, there are several unofficial fees payable to several government officials in the form of "goodwill" (or simply, corruption).

- Beans traders reported that they pay high clearance fees which force most of them to resort to informal crossing routes. At Busia border point, customs officials have gone even further to impose local taxes at these informal crossing points thus increasing trading costs for small traders
- Along DRC-Rwanda border traders dealing with fruits and vegetables are faced with a problem of multiple tax collectors most of whom do not issue receipts and if they do they are fake hand written papers to justify payment. Women are the majority of people who trade along this border and they are usually exposed to discrimination and harassment from officials: delays, sexual harassment, acts of violence, rude behavior and threats of undisclosed fines

d) Insecurity and movement restrictions

Despite efforts by COMESA to harmonise transit trade requirements, border security officials still restrict movement of goods and people across-borders. Local regulations and cultures at border areas restrict non-nationals from engaging in trading activities in the local markets, or make it expensive for foreigners to open new businesses.

- Tanzania has restrictions on business registration, owner residency status and operations for non-nationals (including citizens of EAC member states which do not apply similar harsh requirements)
- Insecurity along Kenya/Ethiopia border poses a barrier to trade of livestock in Moyale border point. The area is characterized by recurrent conflicts, tensions, violence and banditry on the animal trekking routes. This results in lack of investment in communication facilities, infrastructure and veterinary services. Ultimately the commodity prices are distorted considering the risk involved when doing business in the area
- Security is also a major issue along the Uganda/South Sudan border with traders especially from Uganda experiencing harassment from South Sudanese customs and immigration officials
- Roadblocks mounted along the highways for various reasons have been identified as a major constraint especially for maize trade. Kenya and Uganda have been identified as having the highest number of road blocks. For an average distance of 190 km, there are 10 roadblocks in Kenya and 14 roadblocks in Uganda compared to only 5 roadblocks for an average distance of 278 km in Tanzania
- Due to insecurity and poor infrastructure (especially power and hospitality services) a number of the 'small' border points especially those along the border of Uganda and South Sudan, Lake Victoria beaches, and Tanzania/DRC/Burundi borders have restrictions on hours when they are open. Traders in maize, beans and rice at Nimule-Bibia market for example are affected by this insecurity and infrastructure problem which leads to fluctuations in the daily volume of traffic passing through the customs and hence the volume

e) Sanitary and phytosanitary measures

Sanitary and Phytosanitary (SPS) measures are related to food safety as well as animal and plant health regulations. The SPS processes often take long and impose significant extra costs on traders. Usually the traders' concern is whether the administrative charges are commensurate with the services provided by the regulatory institutions whose capacity is usually over-stretched both in terms of personnel and technology. The other concern is that countries have not harmonised their SPS regulations thus hindering meaningful co-operation in regional trade facilitation.

f) Food quality and standards

The value of quality and standards for regional trade harmonization and access to foreign markets cannot be gainsaid yet this is an area of major weakness in the region. Regional food standards should not only be raised to internal levels but also harmonized and applied uniformly within the Nile Basin. Adherence to standards enables countries to fight the spread of pests and diseases and it also protects consumers against toxic substances that accumulate during storage and transport of agricultural commodities.

The survey revealed that procedures for certification of food quality and standards at the borders are usually cumbersome and bureaucratic partly because of resource capacity weaknesses but also due to the fact that, quite often, it involves many institutions some of which duplicate each other's efforts. The exercise is often accompanied by intimidation that tends to discourage traders from dealing with

formal offices and thus either resort to informal trade channels or quit cross-border trading all together. Intimidation arises from information asymmetry: small traders do not always have basic knowledge about customs regulations, standards and legal rights, nor do they have proper access to forums such as internet and publications containing these trade related information and channels for dispute resolution. Customs officials can therefore exploit this lack of trader awareness to extort bribes or to cause unnecessary delays with impunity.

In Uganda, traders experience difficulties during transportation of commodities due to lack of standardized measuring scales at the weigh bridges: they can comply at one site and fail to do so at the next weigh bridge leaving no practical options except to bribe. The problem of weights and measures applies literally across the board and along the value chains where traders use tins and bags whose contents vary in weight depending on commodity, personal habits or even age and structure of the tin or bag. Producers are usually short-changed by traders in these transactions.

6.4.3 Estimates of costs of tariff and non-tariff barriers

6.4.3.1 Costs for maize and beans traders

Estimates of the impact of non-tariff barriers on maize trade in East Africa show that their costs in the case of Ugandan and Tanzanian exports of maize to Kenya was on average US\$ 0.09 per ton per kilometer (Karugia et al, 2007); a comparative analysis is presented on Table 6.65. Maize traders along Tanzania- Kenya – Uganda corridor incur monetary costs imposed on them at each trading stage as shown in Table 6.66. The same study estimates that the costs of NTBs for maize as a share of total transfer cost is 35 percent in Kenya, 50 percent in Uganda and 12 percent in Tanzania (Table 6.67).

Table 6.65: Transfer costs of maize with and without NTBs along Tanzania-Kenya-Uganda corridor

Maize	With NTBs			Without NTBs	
	Distance in km	Transfer cost per km/ton (US\$)	Total transfer cost (US\$)	Transfer cost per km/ ton (US\$)	Total transfer cost US\$
Nairobi-Namanga	170	0.46	78	0.37	63
Nairobi-Busia	500	0.46	230	0.37	185
Dar es Salaam – Namanga	772	0.35	270	0.24	185

Table 6.66: Monetary cost paid to overcome barriers per trip in trade of maize

Issue	Kenya (US \$)	Tanzania (US \$)	Uganda (US \$)
Customs	314	4	130
Immigration	8	1	49
Roadblocks	218	15	509
Weighbridges	41	10	12
Transiting	1	0	44
Licensing	466	4	61
Standards	38	2	76
Municipal	19	14	78
Council	4	25	3
Other problems	5	0	14

Table 6.67: NTBs in maize trade as a percentage of total transfer costs

NTB description	Kenya	Tanzania	Uganda
Weighbridges	2.41	0.97	4.25
Security	0.45	0.73	0.26
Transiting	0.49	0	33.87
Municipal permits	3.61	2.39	2.21
Council permits	3.74	4.31	1.79
Licenses	2.75	0.37	4.46
Customs clearance	12.83	0.75	2.75
Immigration	0	0.13	0.31
Standards and certification	4.92	0.41	2.63
Road toll stations	1.42	0.35	0.63
Bribes	1.94	1.27	1.41
Transfer costs taken up by NTBs	34.56	11.68	54.57

Trading cost of beans from a market in Kampala to a market in Juba

A study by Yutaka Yoshino et al (2011) on growth of cross-border trade between South Sudan and Uganda indicates that *transport and logistics* costs amount to about US\$145 per ton of beans broken down into US\$ 93 inside Uganda and US\$ 52 within South Sudan while *duty and other official charges* add up to US\$ 218.33 per ton. These three aspects constitute the main categories of trading costs. The high trading cost of beans and grains is exacerbated by the numerous nuisance fee payments faced by traders on top of the already high transport costs (Table 6.68).

Table 6.68: Miscellaneous formal and informal payments during transit between Kaya-Juba and Nimule-Juba borders

Cas e	Route	Distance (km)	Total Amount (SD\$)	No. of Payments	No. of Payments per 10 km	Amount per payment
1	Kaya-Juba	233	285	11	0.47	25.91
2	Kaya-Juba	233	205	8	0.34	25.63
3	Kaya-Juba	233	165	9	0.39	18.33
4	Kaya-Juba	233	200	7	0.30	28.57
5	Nimule-Juba	193	145	8	0.41	18.13
6	Nimule-Juba	193	205	6	0.31	34.17
7	Nimule-Juba	193	135	5	0.26	27.00
8	Nimule-Juba	193	285	10	0.52	28.50

6.4.3.2 Transport and other handling costs for livestock traders

Transport costs are an important constraint to livestock trade in the Southern and South Eastern Ethiopia borderlands. Table 6.69 adapted from a study by Tegegne Teka *et al* (1999) shows the informal costs of moving livestock from Ethiopia to Kenya using different modes. Most of the cross-border trade along the Kenya–Ethiopia border is characterized by trekking but trucking also takes place especially when the border is closed or when selling in local markets. Table 6.70 shows trader facilitation fees and waiting charges compared to transport and storage costs.

Table 6.69: Cattle trekking fee from Ethiopia to Kenya for selected border markets

Origin in Ethiopia	Destination in Kenya	Distance (km)	Days taken (Average)	Transport fee per cattle (Birr)	Unit price per km/head (Birr)
Arero	Moyale	200	5	9	0.05
Chilako	Thakaba	50	3	5	0.01
Dollo-Ado	Mandera	40	2	8	0.20
Dubluk	Moyale	135	5	9	0.07
Filtu	Mandera	225	14	6	0.26
Filtu	Ramu	90	7	30	0.33
Galgalo	Thakaba	60	3	6	0.10
Mega	Moyale	100	4	6	0.06
Negelle	Moyale	275	10	17	0.08

Source: Tegegne Teka *et al* (1999)

Table 6.70: Cost of moving different livestock species along different routes

Cost item	Species	Route	Mode of transport	Cost (US\$/km/head)
1. Transport	Cattle	Moyale-Nairobi	Lorry	0.03
	Cattle	Within Garissa catchment	Hoof	0.20
	Cattle	Metama/Galabat	Lorry	0.12
	Camel	Moyale-Agre Mariam	Lorry	0.05
	Camel	Garissa catchment	Hoof	0.02
	Camel	Garissa-Moyale	Lorry	0.15
2. Facilitation fees (per trip)	Cattle	Garissa-Nairobi		32.12
	Cattle	Moyale-Nairobi		27.08
	Camel	Moyale-Agre Mariam		13.75
3. Storage				
(a) Cost of constructing Storage (for 11 year lifespan)	Cattle			343.75
(b) Storage labour per month	Cattle			42.32
(c) Storage labour per month	Camel			15.00
(d) Storage, disease control per month	Camel			37.50
(e) Herding costs per month	Camel			72.19
4. Waiting costs	Cattle			21.88
5. Tariff				
(a) Legal	Cattle	Metama/Galabat		45.56
(b) Illegal	Cattle	Metama/Galabat		2.28

6.4.3.3 The cost NTBs for fruits and vegetable traders

Local Taxes

Traders of all the commodities along the fruit and vegetable corridor pay local taxes in order to transact their businesses. The rates are charged on either daily or monthly basis depending on the market. Other markets peg their rates on the number of bags depending on the commodity such as Irish potatoes. The local taxes also vary from country to country. The average annual expenditure on licences for the traders along the fruit and vegetable corridor ranges between US \$ 50 and US \$. 100 At the customs (at border points) traders pay between US \$ 11.24 to US \$ 337 per trip. Traders pay between US \$ 11.24 to US \$ 112.36 per trip for facilitation which includes bribes to public officials, policemen and at road blocks. Since most of the traders are small-scale in nature, these costs have a number of impacts: increasing the transaction costs and reducing profits; preventing scaling up and sustainability; and in some cases forcing them to exit business.

Terms and conditions and the payment methods

Using cash is the prevalent mode of payment for goods in the study area (62.8 percent), and cash and credit arrangements (28.8 percent). For the goods sold, the mode of payment preferred by the traders is both cash terms and cash and credit arrangements at 57 percent and 43 percent, respectively. Credit arrangements increase the risk factor in business in the event that the money is not paid. When goods are bought on credit they are bought at a higher price than on cash basis. This in turn reduces the profit margin for the traders. On the other hand credit can also be used to spur trade given that the traders do not need to have the hard cash: they get commodities on the basis of trust, sell then remit the cash.

Close to 100 percent of the traders along the fruits and vegetables corridor obtain their foreign exchange through parallel (unofficial) market. There are money agents who are stationed at the various border points along the corridor who are involved in foreign exchange business. This arrangement reduces transaction costs as the money lenders are readily available and no commissions are charged on the transactions that are carried out.

6.5 Impact of trade and investment policies

Several trade and investment policies have been put down by basin countries to ensure food sufficiency, increased production of crops and livestock and to ensure post harvest preservation and conservation and improved food processing. These policies are divided into two categories: those targeting production and trade of crop commodities and those having impact on livestock trade.

6.5.1 Trade and investment policies targeting crop commodities

a) East Africa Community (EAC) Customs Union protocol

This protocol was launched in 2005 and took effect in 2010. The policy was designed to encourage intra-regional trade in agricultural produce. It provides for elimination of custom duties and other charges of equivalent effect, elimination of non-tariff barriers to trade among Partner States and establishment of a common external tariff (CET) applicable to all goods imported into the Partner States from third countries. The customs protocol further provides for the EAC rules of origin, national treatment and safeguards measures for goods from Partner States and trade in the region.

The Common External Tariff was established so as to protect regional products from external competition. Its establishment meant that goods to and from Uganda and Tanzania would be duty free, goods from Uganda and Tanzania into Kenya would be duty free and specific goods from Kenya

into Uganda and Tanzania would attract duty under the program of gradually eliminating internal tariff in five years. Trade in the study commodities is affected by the duties under the Customs Union which levies duty at CET rate 50 percent for maize, 25 percent for beans and for rice 75 percent or US\$ 200/mt (whichever is higher). In most borders, fruits and vegetables are zero-rated though the Uganda customs at Malaba charges about US\$ 1 per bunch for bananas exported to Kenya.

Even with the introduction of this customs union protocol, informal cross-border trade is still very high in all border points of the study corridors. The majority of traders engaging in informal cross-border trade are women operating mainly as small scale traders. Lack of use of formal trading systems/platforms has resulted in insignificant impact on trade over the last decade and this has not been influenced by the regional trade policy initiatives like EAC Customs Union Protocol. Most of the women traders do not have any knowledge of the existence of the customs union protocol. The few who have some knowledge on the protocol do not have confidence that it will assist them. Rather they feel that formal trade will attract high taxation which will reduce their profits.

b) EAC Agricultural and Rural Development Policy (EAC-ARDP)

This policy recognizes the importance of eliminating hunger and ensuring sustainable food security within the region. Its main objectives include: achieving food security and improving the standards of nutrition in the Basin by increasing output, quality and availability of food; encouraging rational agricultural production while promoting complementarity and specialization; improving standards of living in rural areas through increased income generation from agricultural production; improving value addition and marketing; supporting industrialization; and promoting sustainable use and management of natural resources in order to conserve the environment. The main difficulty with a broad policy framework such as this relates to domestication at the national level, allocation of resources and implementation and promoting its synergies with other initiatives such as CAADP. It was difficult to establish how the observed trends in the study commodities could be attributed to EAC-ARDP.

c) EAC action plan on food security (2010-2015)

The EAC action plan on food security (East African Community, 2010) cites inadequate food exchange/trade between times and/or places of abundant harvest on one hand and those with deficit on the other as one of the causes of food insecurity in the EAC region. The priority areas for the EAC food security action plan (2010-2015) include: provision of enabling policy, legal and institutional framework, increased food availability in sufficient quantity and quality, improved access to food, improving stability of food supply and access in the EAC region and finally enhancing the efficiency of food utilization, nutrition and food safety. While there has been progress made in Sub-Saharan as a whole in agricultural growth and development in the last decade, and whereas there has been considerable progress made in governance and reduction of conflicts that disrupt agricultural production and food distribution, gains in food consumption and nutritional wellbeing have been marginal. Likewise, the Nile Basin remains largely food insecure and vulnerable to external shocks and natural disasters. The Action Plan of food security is also undermined by various policy actions of member countries that insist on applying counter-productive trade strategies especially when they face risks of food shortage.

d) Declaration of EAC Heads of State on food security and climate change

In 2010, EAC Heads of State made a declaration on food security and climate change (East African Community, 2010) specifically making a commitment to:

- i) Immediately implement the EAC Food Security Action Plan

- ii) Fast track the development of regional policy for food security; finalization, adoption and implementation of regional legal, regulatory and institutional framework for standards and Sanitary and Phytosanitary measures (SPS); and institutionalization of structured food trading system including contract farming, out-grower schemes, warehouse receipt system and food commodities exchanges
- iii) Increase the budget allocation to the agriculture sector to a minimum of 10 percent of national budgets by 2015 as per the Maputo Declaration directing them to priority programmes and projects for enhancing food security and poverty reduction
- iv) Establish finance and insurance instruments for agriculture development especially for small and medium scale farmers and entrepreneurs
- v) Immediately invest and develop agro-industries for value-addition of food produce from the EAC region
- vi) Ensure that all food security strategies and actions have in-built resilience to weather variability and adaptable to Climate Change
- vii) Ensure that all food security strategies and actions have in-built gender and HIV/AIDS considerations

To a large extent, these proclamations remain in the domain of 'wishes' that are necessary for maintaining diplomatic relations while the strategies for their implementation remain vague. As mentioned in the introductory chapter, the challenges facing initiatives such as CAADP, whose success would have far reaching implications for regional food security, are yet to be fully addressed. Except for Sudan and Egypt, the Basin lags behind in use of irrigation as a means of minimizing food production volatility especially for the major food grains, maize, rice and wheat. There has not been a shortage of conventions and agreements on what can be done about regional food security. However, there have been no success stories on efforts to follow up on the Declaration of EAC Heads of State, for example in the form of innovative partnerships with the private sector to promote scaling up of index based insurance programs as a strategy for climate change adaptation.

e) Maize trade regulations and their impacts on trade along the commodity corridors

Of all the study commodities, maize is mostly affected by the trade policies in the Basin. For instance, there are several customs documents and clearance procedures required in the trade of maize within the East Africa Community¹⁹. For a trader to import maize in the region, s/he required to obtain a Plant Import Permit which is accompanied by a phyto-sanitary certificate from the country of origin. Certain stipulated quality and safety standards must be upheld; particularly in terms of percent of moisture content, foreign matter, packaging and aflatoxin content among others, which is not yet harmonized in the region. In order to export maize within the region, a trader must obtain a certificate of origin and a phyto-sanitary certificate. The requirement of a certificate of origin poses a problem of inaccessibility for most cross-border traders because their issuance is centralized at the capitals or regional towns which are often too far away from the maize trading zones.

In Tanzania, the export permit for maize is obtained from the Strategic Reserve Headquarters which can easily be translated to mean that export/import permit is issued for purpose of monitoring food stock for the country. This in turn leads to ad hoc export bans imposed from time to time in anticipation of poor harvests or maize deficits. Along the maize corridors in the region, phyto-sanitary certificate is a mandatory requirement for all cross-border traders. In the region, the phyto-sanitary standards differ among the countries although the agro-ecological conditions are similar in regard to pests and diseases. The requirement that traders must obtain the certificates from their countries, usually at head offices far removed from border points or the major surplus areas, poses a serious

¹⁹ Kenya is a net importer of maize within the East African Community. It mainly imports from Tanzania through Namanga and Isebania border points and from Uganda through Malaba, Lwakhakha and Busia border points.

problem of inaccessibility to phyto-sanitary inspection services. However, the Kenyan phyto-sanitary certificates are provided at the border points.

6.5.2 Trade and investment policies targeting livestock

6.5.2.1 Principles to guide Nile Basin livestock policy choices

The livestock sector policies in the Nile Basin should ideally achieve a broad goal of ensuring proper linkage of the sector to other sectors of the economy and alignment to broad development objectives. The policy actions to realise the regional livestock policy goal should put emphasis on the specific areas that promise the greatest growth for the livestock sector and poverty reduction, which are at the core of the national strategic objectives of member countries. The Basin livestock policies should particularly be aligned to those of the AU-IBAR because of its institutional mandate to lead the livestock sub-sector of CAADP and the necessity to assist the RECS to develop sub-regional livestock policies that are consistent with the AU Strategy as well as with the FAO and OIE guidelines²⁰.

Livestock policies should, to the extent possible within the principle of subsidiarity and value addition, articulate objectives that are specific to sub-systems of the livestock sector, covering, for example, production and processing subsystems; and, marketing and trade sub-systems (the latter can further be disaggregated into target markets, whether domestic, regional or foreign). This sort of classification provides a basis for prioritization of investments and evaluation of outcomes and impacts of policy interventions. Potential outcomes that are expected from policy intervention include: a) improvement in household incomes leading hopefully to improved food security and nutritional status; b) improved food safety; c) employment generation; and, d) improvement in competitiveness. Similarly, prioritization of investment in the livestock sector should be based on these outcome considerations. Furthermore, the investments should take advantage of emerging opportunities, one notable one being the unprecedented global increase in demand for livestock products, the so called 'livestock revolution'. Reaping maximum benefits from this 'revolution' is only possible with policies that support investment in livestock services while at the same time strengthening institutions and value chain actors.

In view of the above considerations, one would expect the current livestock policies and investment strategies to aim at focusing on the following five (5) mutually dependent thrusts:

- 1) **Trade enhancement:** exploiting market opportunities; identifying areas that will increase competitiveness; developing appropriate standards and approaches that are risk-based rather than hazard-based; dealing with NTBs; and supporting informal markets to commercialize and comply with market demands
- 2) **Investments in livestock services:** service provision; promoting public-private partnerships and collective action
- 3) **Strengthening institutions and actors:** to regulate the industry and compliance with Food safety standards and quality assurance; capacity building
- 4) **Resource management and sharing:** Policies to support conservation of genetic diversity in livestock resources; coordinated management and sharing of natural resources;
- 5) **Disaster preparedness and response:** early warning systems; institutional capacity building; use of indigenous knowledge

A sample of current livestock policies in the Basin (at national and regional levels) are presented in Table 6.71 and their expected outcomes noted.

²⁰ The narrative in this sub-section is based on personal communication with livestock stakeholders and Dr. A. Omoro (livestock policy expert based at ILRI/Nairobi)

6.5.2.2 National level policies

The three (3) sample countries (Kenya, Ethiopia and Sudan) for this review have been selected on the basis of: significance of agriculture (including livestock) for economic growth; livestock population; development of other services such as veterinary medicine supporting the livestock sector and availability of information (policy documents). For instance, the vast majority of Ethiopia's policy documents focus on an "agricultural development-led industrialization" (ADLI) strategy. Although Sudan and Egypt derive a significant proportion of their national income from oil revenues, agriculture contributes, respectively, about 31²¹ and 13.5²² percent to the national economy and is still the major employer of a large proportion of the population. However, there are significant market inefficiencies and challenges that hinder cross-border trade in live livestock. As indicated elsewhere in this report, these include high marketing transaction costs due to high transport fees; weight loss of animals due to trekking long distances, high and rising insecurity, lack of price transparency among market actors (especially brokers), inadequate physical infrastructure (including marketing infrastructure), excess rents and multiple taxation, and ineffective policies. One example of the latter is that cross-border trade is considered as illegal trade in Ethiopia as it denies the government the much needed foreign exchange.

Another ineffective policy is the sedentarization of pastoralists in Kenya. Kenya's Agricultural Sector Development Strategy (ASDS) argues that because pastoral systems are changing with increasing sedentarization due to changing lifestyles and land tenure, and adoption of crop production in marginal lands, agricultural growth in these areas "must be led by intensification and substitution towards more high-value products, and expansion of the cultivated area through irrigation" (p. 9). Ethiopia's Poverty Reduction Strategy Paper I entitled "Sustainable Development and Poverty Reduction Program" (SDPRP) (2002-2005) envisages the voluntary sedentarization of mobile pastoralists.

Because cross-border trade in live livestock has effectively succeeded due to lack of strong external interventions, it demonstrates a free market activity driven by the availability of better markets for local herders and traders across-borders rather than within them. Hence, excessive intervention is likely to constrain the trade. Indeed, CAADP (2010) reports that previous actions have led to significant drops in trade and pushed it further underground thereby greatly aggravating food security problems in the region.

Table 6.71: National policies affecting cross-border trade in live livestock

Country	Trade & Investment policies	Expected impact/Outcome	Reference/Policy documents
Kenya	1. Recognition of pastoralism as a viable and sustainable livelihood activity	public support of pastoralism in general & livestock production in particular	Sessional Paper No. 2 of 2008 on National Livestock Policy
	2. Provision of affordable credit facilities to both small and large-scale livestock farmers through the revitalization of the existing public institutions, including the AFC	enable livestock traders to increase their participation in livestock trade	
	3. Livestock breeding programs and promotion of research and extension in livestock through the establishment of the Kenya Livestock Research Institute (KELRI)	increase livestock productivity & production and therefore contribute to livestock trade	

²¹Behnke, R. and Osman, H.M. (2012). The Contribution of Livestock to the Sudanese Economy. IGAD LPI Working Paper No. 01 – 12.

²²http://en.wikipedia.org/wiki/List_of_countries_by_GDP_sector_composition

Country	Trade & Investment policies	Expected impact/Outcome	Reference/Policy documents
	4. Promotion of fodder production and pasture conservation to mitigate the effects of both pests and drought on fodder and pasture	increase livestock productivity & production and therefore contribute to livestock trade	
	5. Unofficial support of influx of live livestock from Kenya's neighbors	enhance trade in live livestock helps Kenya to meet her demand for meat & get surplus for export	General observation
	6. Infrastructure development (e.g., LAPSSSET), markets and marketing infrastructure	enhance trade in live livestock between Kenya & Sudan and Ethiopia	Key informants
Ethiopia	1. Consideration of cross-border livestock trade as illegal trade	negatively affects cross-border trade	-Respondents
	2. Recognition of pastoralism as a viable and sustainable livelihood activity	public support of pastoralism in general & livestock production in particular	A Plan for Accelerated and Sustained Development to End Poverty (PASDEP)
	3. Gradual ban of trade in live livestock in the next 10 years in favor of value addition in meat and meat products	effectively curtail cross-border trade in live livestock in Ethiopia	-Key informants
	4. Investment in ranches and standard feedlots	promote livestock production for value addition	
	5. Introduction of financial services targeting feedlot operators [e.g., the Oromia Cooperative Bank has started such a programme]	enable livestock traders to increase their participate in livestock trade	
	6. Breed improvement programs especially in south Ethiopian rangelands	enhance livestock production for value addition	
Sudan	1. Substitution of oil by livestock as the major source of government revenue since the recent collapse of the oil industry	promote livestock exports	-Key informants
	2. Unrestricted access to foreign exchange earnings either to buy goods or to sell the hard currency to third parties	enable livestock traders to purchase livestock	Dirani et al. (2009) ^{***}
	3. Expansion of manufacturing of veterinary drugs and vaccines		
	4. Provision of veterinary services to nomads		
	5. Research, capacity building and genetic improvement of livestock		
	6. Rehabilitation of veterinary quarantines, slaughterhouses and tanneries		

Country	Trade & Investment policies	Expected impact/Outcome	Reference/Policy documents
	7. Production of baled dry fodder to ensure availability of feed during summer		
	8. Establishment of dams, <i>hafeers</i> and other water reservoirs for livestock		
	9. Provision of credit facilities for the public and private livestock sectors		
	10. Designing programs to develop livestock production exports		

** According to Dirani et al. (2009), these investment plans are espoused in the Millennium Strategy for the Development of the Agricultural Sector (2003–27) which adopts a five-year development plan (2007 to 2011).

6.5.2.3 Regional policies

There are no regional policies on live livestock trade. Each country pursues its own policies individually or in cooperation with others (Desta, 2007). However, there has been some policy initiatives aimed at regionally harmonizing intra-country livestock policies. For instance, the IGAD Livestock Policy Initiative (IGAD-LPI) spearheaded the formulation of a regional policy framework on animal health for trade and poverty reduction in 2009, which aimed to: (i) harmonize national livestock policies that are at variance at regional level so as to facilitate improved trade within IGAD countries and between IGAD and the rest of the world, (ii) formalize livestock marketing systems in the IGAD region, (iii) introduce a regional approach in the management of transboundary animal diseases (TADs) and other emergencies, and (iv) design a regional approach in the implementation of the international protocols on animal health and trade. However, the initiative has not been rolled out in different countries.

The East African Community (EAC) secretariat is in the process of developing a regional livestock policy aimed at streamlining the livestock sector. Among the issues to be addressed by the regional livestock policy are: (i) prevention and control of TADs, (ii) improvement and conservation of animal genetic resources, (iii) livestock trade and marketing, (iv) development of pastoralism, (v) animal nutrition (feeds and feeding), (vi) animal welfare, (vii) laboratory and epidemiology networks, (ix) livestock and diseases data mining and archiving, (x) coordination of marketing information of livestock and livestock products, and (xi) livestock research.

Although the Comprehensive Africa Agriculture Development Programme (CAADP) is a continental development framework, its objectives have a regional dimension. The CAADP Livestock Companion Document gives the following priority policy and action areas for livestock in the medium rainfall region of the semi-arid and sub-humid zones:

- (i) Development of means to increase the sustainable productivity of the infertile, fragile soils of the region, including crop-livestock systems, using legumes, forages, organic and mineral fertilisers, and improved pasture management
- (ii) Expansion of coarse grain, root crop, and oilseed production and development of a commercial feed industry based upon these crops and agricultural by-products
- (iii) Facilitation of technology transfer, in particular for animal-based mechanisation and integrated nutrient management

- (iv) Development of practical technologies for controlling animal diseases that limit livestock productivity, in particular trypanosomiasis, tick-borne, and other parasitic diseases
- (v) Facilitation of access to inputs and services such as development of more effective animal health delivery systems, extension services, financial services
- (vi) Improvement of the productive potential of indigenous livestock breeds while taking advantage of the positive attributes such as adaptability to the local environment, particularly trypano-tolerant animals, for use in these zones
- (vii) Development of infrastructure for transportation, processing and marketing of livestock, livestock products and feeds
- (viii) Promotion of equitable market policies that encourage smallholder investment in livestock production and balance the interests of producers and consumers (e.g. appropriate foreign exchange rates, anti-dumping, measures, equitable land and water policies, avoidance of subsidies to large-scale operators, advocacy, for equitable international standards)
- (ix) Control of animal diseases that limit regional and international trade and the development of commodity-based export systems that supply processed livestock products to international recognised standards and at acceptable levels of risk to importing nations
- (x) Development of adapted sanitary and technical standards and the deepening of regional trade agreements within Africa to increase trade in livestock and livestock products.

6.5.2.4 General remark on current status of livestock policies

The main constraint militating against large-scale exports of livestock and livestock products (LLPs) from Africa as a whole is lack of *competitiveness* against other suppliers in the international market such as Australia, Brazil, Argentina and India. For example, these competitors are reportedly able to land beef in importing countries at prices ranging between US\$ 1300 and US\$ 2000 per ton, much lower than the average for beef from southern Africa (the largest beef exporting region in Africa) which range between US\$ 3000 and US\$ 5000 per ton while in Nairobi, high-end retail prices range between US\$ 5000 and US\$ 6000 (Ackello-Ogutu et al, 2007). It should also be noted that prices in the EU market that in the past was a much sought after destination for LLPs have been trending downwards making regional markets more attractive. The southern African countries (notably Botswana and Mauritius) have much better infrastructure than the Nile Basin region that relies on sourcing animals from pastoralists. Pastoral livestock systems are now facing serious problems of climate change but even without this, the adapted animal breeds and husbandry methods severely limit consistency in product quality, scaling up and commercialization.

The CAADP Livestock Companion document mentioned above does not explicitly address policies aimed at promoting cross-border live livestock trade in Africa. Although many countries are at the moment keen to export live livestock, there are a number of contradictions that this trend raises, including the quest for increased value addition and development of cottage industries at the national level that exports would hurt. Productivity and access to export markets remain as major challenges for African livestock sectors as a whole and our view is that policies addressing this dimension should in addition tackle problems related to: i) strengthening of livestock marketing institutions and actors; ii) harmonization of regional standards and supporting value chain actors towards compliance; iii) promoting regional resource management and sharing; and iv) regionally coordinated information management and sharing, early warning systems and disaster preparedness and response.

Finally, both national and regional livestock policies reviewed above are still largely works in progress and their implementation, scaling up and sustainability will require a lot of political will and both human and financial resources.

7.0 Recommendations

7.1 Main Constraints and Challenges to increased Productivity and Trade in the Nile Basin

The survey results reaffirm the persistence of the common challenges to economic growth in the Nile Basin, namely: wide spread poverty that limits consumer demand; poor state of infrastructure; underdevelopment of agriculture arising from low investments in the sector; low use of agricultural productivity enhancing innovations, particularly improved seeds, fertilizer and irrigation; policy related issues such as low institutional capacity for implementation, corruption and policy reversals; persistence of non-tariff trade barriers; vulnerability to external shocks; and, poor coordination of preparation and response to natural disasters. The specific constraints facing the project commodity clusters are numerous but many of them are cross-cutting as can be seen from the lists provided below.

Grains and pulses: Poor infrastructure (poor roads, lack of storage facilities), high costs of inputs (mainly fertilizer and seeds), under-investment by governments in productivity enhancing innovations that leads to high costs of adoption and low productivity for grains and pulses except in Egypt; post-harvest losses, inadequate market information leading to producers being exploited by middlemen; lack of standards; lack of capital for scaling up business operations; poor value addition and agribusiness skills; volatility of commodity prices; government policy related problems and bureaucracy at border customs; poor harmonisation of policies across the borders; numerous and persistent NTBs; inadequate utilization of Lake Victoria for transport; and, inadequate market information.

Fruits and Vegetables: Poor infrastructure (poor roads, lack of storage facilities); high cost of compliance with SPS requirements especially for smallholder producers; poor vertical integration with processors and large urban retailers and exporters; high costs of entry at down-stream levels of the value chain; high post-harvest losses due to poor storage facilities, inadequate market information; low levels of value addition and agribusiness skills; lack of certified seeds or planting materials; high costs of inputs (fertilizers and other chemicals), lack of value addition or processing capacity; corruption among government officials along the corridor; and numerous and persistent NTBs.

Live Livestock: Low productivity in pastoral areas; erratic supply; insecurity and vulnerability to impacts of climate change in main production areas; poor market penetration and poor access to market information by small producers; exploitation of pastoralists by agents; poor marketing infrastructure (watering points, safe and vet supported holding grounds); weak government support regarding investments in vet services and research/development in rangelands; frequent disease outbreaks; lack of certified abattoirs; and, limited value addition and cottage industries.

The Sub-sections that follow provide recommendations on how to address some of the constraints the Nile Basin countries are experiencing in their attempts to raise agricultural productivity and trade and in the process achieve broad based economic growth that can contribute towards elimination of poverty. The task of improving human welfare in the region must be seen as a responsibility of everyone, not just governments and regional integration institutions such as EAC, COMESA and IGAD. For the specific policy recommendations and proposed investments, efforts have been made to show strategies for implementation and how to proactively engage the private sector as well as smallholder producers who form the majority of market players upstream in the commodity value chains. Attempts have also been made to indicate potential locations and duration of the investments, public sector investments and incentives needed to unlock private sector participation and the roles of other regional institutions. National and regional institutions have various on-going initiatives aimed at promoting cross border trade but capacity weaknesses, the fragmented or sub-optimal nature of the projects, poor implementation and policy retrogression have in the past proved inimical to realization of the anticipated outcomes and impacts.

The recommended policy reforms and investments are those deemed to offer significant opportunities for multi-sectoral and intra-regional collaboration in tackling transboundary problems. Due to the wide diversity of the Nile Basin, the recommended actions and investments do not purport to address the specific needs of each country since national priorities tend to differ.

7.2 Recommendations on identified priority interventions for public sector at national and regional levels

7.2.1 Policy strategies needed to increase crop productivity

The Nile Basin has abundant land and water resources making agriculture a priority area in strategies aiming at poverty reduction. The NEPAD/CAADP that has brought agriculture back in the political and development agenda is a major hope in terms of attracting investments to the sector. But there is a need for evidence based prioritization of areas within agriculture where resources should be allocated in order to have the largest impact on growth and poverty reduction. Budgetary allocations to agriculture under the CAADP framework are still too low largely due to investment risks, low absorptive capacities and lack of supporting infrastructure and institutions. IFPRI simulations show that Sub-Saharan Africa (SSA) countries will need to increase their annual agricultural growth to 7.5 percent per year in order to achieve MDG1 requiring agricultural spending to increase to US\$13.7 billion per year. A few Nile Basin countries are gradually edging towards meeting the CAADP goal of allocating 10 percent of their national budgets to agriculture but some have consistently remained off course. The fastest means of increasing agricultural productivity is through a technological transformation and commercialization entailing the use of fertilizer, improved seed varieties and irrigation, backed by appropriate policy reforms and incentives to increase private sector participation.

Increasing use of fertilizer and high yielding seed varieties

A major avenue for increasing crop productivity involves a radical increase in the use of fertilizer, an area where the region performs rather poorly. According to the International Fertilizer Development Center, fertilizer use is extremely low in many SSA countries, averaging a mere 8.8 kg per hectare (ha). An increase in fertilizer use to 50 kg/ha, a level that has already been reached by most middle-income countries and which is a target established by an African Fertilizer Summit (in 2006), can lead to an enormous increase in crop yields but the implied expenditures would obviously be beyond the capacity of the majority of the regional governments and poor farmers. Governments have a significant role in ensuring adequate supply of fertilizer and improved seed varieties but this role is currently not being played effectively.

Recommendations

- *One particular option that has been tried in countries such as Malawi, Zambia, Kenya, Tanzania and Uganda, is the use of subsidies but the experience thus far only reveals more problems: lack of consistency, predictability and sustainability. Subsidies constitute a heavy burden on the treasuries, are prone to abuse and often lead to market distortions and inequalities that could be avoided if the root causes of poor access to fertilizer, such as profitability, import costs, high transport charges within the region due to poor infrastructure and high government taxes are addressed. If subsidy programs are well targeted and administered within a limited period of time, they could raise total fertilizer use in the region. But such strategies will also have to be combined with policy strategies promoting access to rural credit*
- *The other option is for the Nile Basin to invest in a regional joint venture of constructing a fertilizer plant subject to carrying out a feasibility study to establish financial and economic viability*
- *Innovative private/public partnerships similar to the Kilimo Biashara tripartite arrangements in Kenya (bringing together government, commercial banks, and development partners) as a means of availing cheap financial resources to allow poor farmers to access agricultural inputs. Such efforts need to be scaled up and emulated by other countries*

Expanding irrigated crop area

Fertilizer use correlates closely with area under irrigation and here again, the Nile Basin significantly lags behind other regions in Asia and Latin America. Out of a potential irrigable area of about 600 million ha in the COMESA region, only 2 percent is under irrigation (WBCSD and IUCN, 2008) and 75 percent of crop production in all COMESA countries, except Egypt and Sudan, rely on rainfall. As the variability of rainfall patterns increases due to climate change, the risks of using chemical fertilizers in degraded tropical soils will increase thus putting into jeopardy any efforts aimed at increasing crop productivity. Although the answer to the dilemma of low fertilizer consumption may lie in exploiting the region's irrigable but idle land, there are inherent socio-economic and environmental challenges that cannot be wished away: prohibitive investment costs for large scale irrigation projects, lack of technical know-how among smallholder farmers, low value-cost ratios for the irrigated crops, competing uses for available water and land resources, and undesirable environmental impacts. The determination of the range of crops that will do well in given locations need to be addressed together with issues to do with water harvesting in areas without permanent water sources and market access.

The region faces a unique dilemma with respect to alternative sources of investment capital for irrigation. There is a strong temptation for land rich but capital and technology deficient countries in the region (e.g. Ethiopia, South Sudan, Tanzania, and to some extent, Kenya) to lease off their idle land to foreigners originating particularly from India, Saudi Arabia, and South Korea. This so called land grab has been the subject of heated debate that point to both positive and negative dimensions. Among the positives are the opportunities in the form of foreign direct investment, employment creation, skills transfer especially for management of irrigated agriculture and improving financial viability of regional fertilizer plants. Controversies arise largely from questions to do with whether the lands targeted are really idle, compensation for communities that lose out (at least in the short run before the benefits of irrigation and increased productivity accrue to them) and transparency in negotiating the lease agreements.

Recommendations

- *Support producers to invest more resources in high value crops such as fruits and vegetables and strengthen the value chains by providing the requisite storage and marketing infrastructure; in addition, promote vertical linkages that lead to improvements in smallholder skills in irrigation and management*
- *Undertake feasibility studies to map out the range of profitable crop enterprises in different agro-ecological areas of the Nile Basin; in addition establish socioeconomic and environmental impacts of scaling up irrigated agriculture especially in the arid and semi arid parts of the region*
- *Promote water harvesting and micro-irrigation agriculture, especially in peri-urban areas*
- *Explore partnership arrangements and south-south cooperation as a means of financing irrigated agriculture, transfer of technical skills and institutionalizing a culture of commercial agriculture among smallholder producers. But there should be caution in embracing south-south cooperation in circumstances where there is lack of equity and transparency and where there are possible risks of future conflicts between communities and foreign investors*

7.2.2 Policy strategies for increasing productivity of livestock

The region's livestock (cattle, shoats and camels) are found mainly in arid and semi-arid (pastoral) areas. The main challenges in pastoral lands relate to poor infrastructure and access to basic services that other parts of the region enjoy (such as education, health and security); low human capacity; and, market failure arising from internal and external factors. Consequently, poverty levels and vulnerability to external shocks in pastoral lands are usually much higher than the national averages. In the corridors surveyed under this project, the livestock production systems are also characterized by degradation of rangelands, insecurity and demographic pressures; not just transhumance but also immigration of people from neighbouring farmlands, trends that seem to lead to ethnic clashes.

Recommendations

i) Interventions for increasing pastoral livestock productivity ideally should begin with stabilization of the economies of these highly fragile and insecure environments. Economic stabilization would require the following:

- *Promoting attitudinal change among pastoralists and ensuring political commitment towards implementation of policies targeting mainstreaming of pastoralism in the national economies*
- *Improving governance and the rule of law and dealing with the threats of market failure that tend to lock out private sector investment in provision of key services; and developing the requisite infrastructure to support governance and rule of law*

ii) Improving the livestock value chains

- *Investing in development of human resource capacity (education, health and job creation)*
- *Building transport and communication infrastructure*
- *Supporting development of marketing infrastructure such as abattoirs, holding grounds, dams, boreholes and pans, and quarantines. These aspects have all been catered for under two transboundary investment proposals on a) towards a regional disease-free zone for the Nile Basin and b) Nile Basin LLP processing hubs; and one national but regionally coordinated project aimed at improving live livestock marketing infrastructure by constructing strategically located earth dams along the movement routes*
- *Irrigated fodder production and clearing and reseeding of rangelands to improve forage and deal with rainfall variability*
- *Better management of the natural resources in pastoral environments and promoting alternative sources of livelihood – linking the regions with tourism sector*

iii) Strategies for the long run dealing mainly with value addition, sustainability issues and managing risks such as those relating to climate change, insecurity and changes and/or diversification of main sources of livelihood. These long term endeavours will require active participation of governments, for example by putting in place public goods type investments and dealing with risks. However, the strategy must find mechanisms for crowding in the private sector and ensuring a business enabling environment regarding appropriate legislations, supervision and regulation.

7.2.3 Promoting competitiveness and access to markets by smallholders

Increasing market access

Smallholder farmers account for a significant share of marketable agricultural production in the Nile Basin but individually, their operations are characterized by subsistence and limited participation in markets. Their productivity is low, they add little value to their produce and hence earn a meager proportion (usually no more than 15 percent) of what consumers pay. This situation, described in literature as low equilibrium poverty trap needs to be addressed by regional governments in order to boost private sector confidence and commercialization.

The agricultural markets in the region, especially for staple food grains (maize, wheat and rice) remain firmly under the watch of government and often become politically sensitive. The main reasons for this are the large number of smallholders still deriving their livelihood from food production; poor food distribution networks; reliance on rain-fed production; asymmetries in information and capital scarcity among smallholder producers that tilt markets in favour of brokers, transporters and millers; and the seasonal opportunities the food industry offers for corruption in import/export business and emergencies.

In order to increase market access by smallholders in the Nile Basin, the following are recommended:

- *Government strategies should focus on reduction of information asymmetries, particularly, the use of information and communication technology*
- *Supporting formation of strong farmer based institutions and their linkages with more established value chain players*
- *Forming partnership that promote innovative rural financing approaches and access to productive technologies*
- *Investing in development of enabling environment (physical infrastructure, incentives and services)*
- *Building capacity of regulatory and over-sight institutions that are managed under public-private partnerships*

Innovation and competition

Countries in the Nile Basin have traditionally exported to Western Europe (largely due to the colonial legacy) and, to a lesser extent, North America. Right now, however, other markets beckon, both within the region and beyond. Exporters of agricultural products in the region must be encouraged to start developing vertically integrated links and partnerships that can help them access technology, capital and markets around the world. Trade world wide is today being nurtured through strategic corporate mergers and other off-shore contracting relationships between sellers and buyers. It is being shaped by firms competing, not just on the basis of superior technology and low factor costs but also by attaining competitiveness through dimensions that transcend the enterprise itself (e.g. infrastructure, utilities, financial markets and macroeconomic policy framework – so called, business enabling environment). The private sector will be the dominant factor in linking the large scale commercial farmers and processors with markets while the smaller farmers must organize themselves into economically viable groupings, such as cooperatives, in order to participate and draw commensurate benefits from the value chains. Through such links, the smaller operators can also get equitable access to input and output markets, credit, innovations, knowledge and information.

Recommendations

- *Regional trade institutions and governments should encourage adoption of innovative ways of doing business instead of allowing markets and value chains to struggle through lengthy and inefficient natural market evolution*
- *Opening up of current and potential surplus production pockets in the region through infrastructure development, such as water transport in Lake Victoria, will unlock the region's productive potential and the ensuing commercialization and competitiveness will spur increased investments in marketing and product design and development innovations as well as encouraging entrepreneurs to 'think outside the box'*
- *Promoting innovative ways for commercial partnerships and for sourcing international capital*

Adding value and discovering new markets

The driving force behind value added agriculture is the consumer. Urbanization (the emergence of mega cities) and globalization on the other hand have made the commodity chains more complex with a whole range of agents and service providers, the result being the considerably diminished incomes that farmers receive as a proportion of consumer prices. The philosophical rationale behind value addition is getting the producers and small value chain operators to be part of this evolution.

The rapid demographic changes, increasing urbanization and per capita incomes and the changing macro-economic environment for business investment in literally all Nile Basin countries augur well for value addition. Urban population is projected to double by 2030 and if per capita income growth rates can be sustained at their current levels (averaging about 4 percent per year in SSA), urban food markets will quadruple in the next 20 years (World Bank, 2011). The private sector has appropriately responded in the form of new merchandising and investment strategies, including aggressive advertising; mega retail outlets; and more efficient transport systems, cold storage and warehousing. These developments are highly visible in the food grains and horticulture value chains particularly those with strong links to urban and export markets. Such developments have been taking place in the last 20 years in other land abundant countries such as Brazil and Thailand.

Value addition benefits in the Nile Basin remain restricted, and for the grains and fruits and vegetables analyzed in this report, the value chains are characterized by high transaction costs, lack of reliable market information and high post-harvest losses at farm as well as transport stages. Other specific constraints relate to poor marketing strategies such as inappropriate packaging, low investment on infrastructure to minimize post-harvest losses, lack of strategic knowledge about demand characteristics, poor and/or inequitable institutional arrangements, and lack of agro-processing skills and capital, especially among smallholder producers.

What needs to be done to increase value addition and to broaden the benefits to up-stream levels of the value chain?

- *Reorient production structures towards non-traditional exports, which for agriculture comprise a wide range of fresh and processed specialty products, and be able to effectively participate in the emerging global niche markets*
- *Governments, RECs and regional commodity groups should provide specialized information and professional knowledge and, where possible, building institutional capacity to effectively manage the wide array of development partners who provide financial and training support to the agriculture sector*
- *The member states should strive for stronger and regionally harmonised regulatory and legislative environment as well as good infrastructure and financial resources*
- *At the micro-level, the following constraints should be addressed by line ministries and state corporations: weak technical capacity for pre- and post-harvest processing techniques;*

inappropriate policies; and low capacity for undertaking market research among value chain players

Taking advantage of agro-climatic diversity and abundant natural resources in the region

The Nile Basin has a wide diversity of agro-climatic conditions that make it possible to produce a variety of agricultural products in high demand in both domestic as well as foreign markets and indeed, to significantly improve the nutrition of rural populations. The region as a whole has the advantage of proximity to expanding markets in the Middle East and Europe where many of its member countries enjoy historical trade ties and preferences. Agriculture (and its associated industries) where the natural comparative advantage of the region lies has recently experienced a sharp rise in foreign direct investments, private equity investments and sovereign wealth funds. And, following the food price crisis in 2006/08 and again in 2010/11, there are great prospects for increased funding to the sector from donors (e.g. Feed the Future initiative by USA; pledges by the G-8 countries and European Commission; Gates Foundation; and south-south official development assistance).

Under a business as usual scenario, projections by IFPRI show that dependence on food imports in SSA as a whole will grow leading to a doubling of cereal, dairy and meat imports by 2025. This will provide a large potential market to act as a basis for implementing competitive non-distortionary import substitution policies (World Bank, 2007). Through these developments, the renewed benevolence of donors and abundance of natural resources, the Nile Basin should be aiming at being a net exporter of the major food grains such as rice and wheat as well as attaining self-sufficiency in maize which could in turn benefit the livestock feeds sub-sectors (World Bank, 2009) rather than bearing the burden of overdependence on imports.

Recommendations

- *Implementation of the CAADP framework should be locally owned and hastened, and institutional capacities should be strengthened to ensure sustainability of gains in productivity*
- *Risks associated with agricultural commercialization and those arising from climate change should be addressed by the state in order to increase adoption of modern farming techniques, especially among poor farmers*
- *Constraints such as capital, poor infrastructure, managerial skills and market access that lead to under-use of the available land and water resources in the region should be addressed*
- *More efforts should be directed towards participatory approaches in prioritisation of investments in agriculture as well as in institutional reforms, transparency and accountability should be promoted in order to ensure efficient and equitable use of donor funds. However, inflows of donor funds should not be allowed to crowd out mechanisms and initiatives for mobilizing development resources within the region*

7.2.4 Trade policies as tools for responding to price fluctuations

All the Nile Basin countries have demonstrated considerable enthusiasm about regional integration and talks about more ambitious forms such as economic unions and political federations have not ceased to hit newspaper headlines. However, shifting gears to fully functional customs unions under EAC and COMESA, in which all Nile Basin countries are members, continues to face huddles. Consequently, barriers to cross-border trade flows within the region, especially NTBs, have persisted thus denying both producers and consumers the benefits associated with free trade. Trade has the potential for being a valuable long term tool for coping with regional and national supply (and price) fluctuations, but its effectiveness has been reduced by the failure to implement fair and rule-based trade protocols under the auspices of the institutions entrusted with regional economic cooperation (RECs). The experience of the 2006/08 food price volatility exposed the region's vulnerability to

external shocks but, more importantly, it emerged that countries tend to favour unilateral inward looking responses that often have worse outcomes for all (von Braun et al, 2008). Furthermore, the crisis lent some degree of merit to policies promoting long term national food self-sufficiency despite the fact that this approach generally runs the risk of catalyzing an inefficient production system with excessive locked up reserves.

Recommendations

- *Through the RECs, it is possible to implement more coordinated trade policies such as the elimination of unjustified non-tariff barriers and outlawing arbitrary export bans. The root cause of the persistence of NTBs in the Nile Basin is low productivity at both farm and agro-processing levels (that have already been addressed in one of the above recommendations) and irrational policies arising from inadequate market based evidence*
- *Harmonization of product standards and customs requirements across countries can increase intra-regional trade and stabilize food prices. Such cooperation, coordination and openness will foster trade flows and definitely help blunt the amplitudes of food price swings in the regional markets*
- *The RECs can also play a direct role in enhancing trade related market information and intelligence systems. Mechanisms for collating and sharing food balance sheets between different countries already exist but they need to be strengthened in order to cover longer time horizons and options for remedial actions. However, for the RECs to be more effective, their resource capacities need to be revamped and their technical/professional manpower expanded/deepened. The RECs currently thrive on meagre operational budgets contributed to a large extent by development partners that also tend to set the development agenda*
- *The region should establish a virtual food reserve (or a well coordinated ICT based market as proposed later in the section on potential investments) in order to help prevent market price spikes and to keep prices closer to levels dictated by long-run market fundamentals, like supply and demand.*
- *The main policy objective in cases of emergencies arising for example from weather induced price shocks is to minimize welfare losses especially among the most vulnerable members of the population (Ghanem et al, 2011; and Ackello-Ogutu, 2011).*
- *Building the capacity for early warning systems, disaster preparedness and response within the RECs is an important compliment to emergency response, especially with regard to mobilising resources from the international community and better management of grain reserves to ensure food reaches those in need more easily and cheaply*
- *The main short term responses to the food crisis by countries in SSA as whole aim principally at muting the inflationary pressure on the economy and protecting the most vulnerable groups, for example, by reducing relevant taxes on food items or imposing export bans. However, strategies aiming at cushioning domestic markets from fluctuations in border prices can be highly distortionary and their success depends on their timing, how social equity goals are balanced with long term production efficiency interests and, last but not least, how the programs are administered*

7.3 Summary of Investments and Policy Reforms – Lead Coordinating Institutions

Detailed profiles of the investments summarised below are provided in the Annex.

I. Nile Basin Initiative (NBI) to take a lead role			
Investment	Key collaborating partners		
1.1 Improving water transport and landing sites on Lake Victoria Modernising landing areas and providing infrastructure and sanitation; storage for fruits and vegetables; transport and communication network; special bays/facilities for handling live animals	EAC/Lake Victoria development project; HCA; Livestock Marketing Association		
1.2 Strategic Earth Dams (serving both agriculture and livestock) Implemented at national levels but regionally coordinated	IGAD, NB member countries; AU/IBAR		
1.3 Strategic storage for grains, fruits and vegetables Warehousing; agricultural commodity exchange (NBACE); grains electronic market (grains e-market); Standards (e.g. Maize Standards 2013)	EAGC; telecom/ICT firms; NB member countries		
1.4 Regional Agricultural Trade Training Centre (administered by EAGC) Targeting value chain players in both public and private institutions and aiming to achieve a better understanding of trade related policies, gains from trade, trade facilitation, and key determinants of agri-business and efficient value chains	EAGC; Universities and colleges		
1.5 Wet agro-processing for crops and livestock a) Pilot infrastructure for the cottage industry - oil from corn and pulses b) Agro-processing infrastructure for juice c) Pilot agro-processing infrastructure for banana wine by women and youth d) Cottage industries for cheese, ghee, blood products by women and youth	EAGC; Livestock marketing association; Private sector; standards and food safety regulators		
II. Other Potential Investments (requiring collaboration of regional partners)			
Investment	Institution coordinating Investment		
	Nile Basin Initiative (NBI)	Member Countries	RECs and commodity groups
2.1 Policy reforms and strategies (proposed actions are given in Sub-section 7.2 The main aims of these are to: a) Increase use of fertilizer and high yielding seed varieties		✓	✓
b) Expand irrigated crop area		✓	
c) Increase livestock productivity		✓	
d) Promote competitiveness and access to agricultural markets by smallholders (increasing market access; innovation and competition; adding value and discovering new markets)		✓	✓
2.2 Regional seed multiplication centres for bananas, passion fruits and Irish potatoes with hubs located in countries with comparative		✓	✓

<p>advantage. There are national programs that lack benefits of economies of scale</p>			
<p>2.3 Good agricultural practices (GAP) system</p> <p>Aims to increase quality and value addition; increase food safety and standards; facilitate traceability and efficient management of market information. Investments needed to increase compliance especially by resource poor value chain players</p>	✓	✓	✓
<p>2.4 Grains electronic market (e-Market for grains and pulses)</p> <p>Main objectives: a) to link buyers and sellers by providing accurate and timely market information; b) improve market integration; c) eliminate of market information asymmetries. Initiatives already exist – investments needed for scaling up to cover entire region</p>	✓	✓	✓
<p>2.5 Regional maize standards 2013</p> <p>As part of value addition and product differentiation. Initiatives already being implemented by EAGC – investments needed for scaling up to cover entire region</p>		✓	✓
<p>2.6 Towards achievement of a regionally coordinated disease free zone</p> <p>Investments should initially focus on: promoting livestock commodity based trade; small stock compartments; animal branding and vaccination programs. This is a strategy for increasing access to regional and foreign markets, including niche markets</p>		✓	✓
<p>2.7 Livestock and Livestock Products (LLP) processing hubs (Dry agro-processing)</p> <p>The investments should ultimately spur commercialization of livestock production, efficient sectoral linkages, increased value addition and demand for LLPs. Initial investments to target establishing value addition infrastructure (e.g. export rated abattoirs; functional sale yards, telecommunication services and cold storage)</p>	✓	✓	

8.0 Strengthening Capacity of Regional Commodity Groups

8.1 Background

The vision of the commodity groups such as the EAGC and HCA is to provide public goods type of services to their membership. In a market system that is not characterized by information asymmetries, such organizations would soon find themselves redundant. With rapid progress and gains made in information and communication technology (ICT) in some of the countries in the region, they may already be under intense pressure to be innovative and to ensure they add value in the commodity chain. The real challenge has to do with the high concentrations in most of the agricultural commodity industries (both production and marketing), the diversity of commodities exchanged across the borders, production fluctuations and hence risks due to dependence on rainfall and high incidence of poverty that demands balancing the private sector profit motive and safety nets for resource poor producers who account for over 70 percent of the marketable surpluses.

Under these circumstances, and considering the dualistic nature of agriculture in the region, policy makers must seriously consider whether strengthening the capacity of the regional commodity groups would only serve narrow interests of a few large-scale grain producers and millers instead of lifting millions of smallholders out of poverty traps. The situation prevailing in the region is such that smallholder producers and traders are disadvantaged by a plethora of constraints that hinder their effective integration with large regional institutions: their diversity, low levels of commercialization and risk aversity often exposes smallholders to exploitation by agents.

A prerequisite for ensuring that an optimally capacitated regional commodity group serves the interests of small diverse producers is that the capacity of the latter is elevated, for example through strong grassroots organizations, education, information access and appropriate policy, regulatory and legislative environment. Once this is done, the next issue would be to assess financial and human resource capacities that ought to be in place at the head offices (secretariats) of the regional commodity groups as well as at the nodal points; the latter cascade the strategy implementation to stakeholders for example through buy-ins and ensuring adherence to the principles of subsidiarity.

Since the commodity groups tend to be voluntary in nature and dependent largely on donor support, up-scaling of operations in a sustainable manner is often elusive and success tends to a function of the degree of vigour or zeal of a few lone rangers. This tends to affect stakeholder perceptions about the motives and confidence in ability to deliver services such as price information accurately and timely. Similarly, due to resource constraints, the secretariats tend to be lean but inability to attract qualified staff and innovate more aggressively into ICT precludes efficiency (especially in data analysis, dissemination/communication and advocacy) hence the highly commercialized and/or large members may shun active patronage. This dilemma is exacerbated in situations where policy dichotomies exist, for example where large maize and wheat producers advocate for high import tariffs while millers demand for their reduction or abolition.

Finally, regional commodity groups also have to deal with the issue of how to engage government ministries that deal with research, extension and regulation of the commodity production and trade: how government is represented in the commodity group can be rather tricky considering the fact that the groups often lobbies government for policy reforms in favour of its membership. We mention these issues to highlight the need not just for building capacity of the regional commodity groups but also the necessity to be innovative and proactive in terms of their engagement and dissemination strategies.

Our baseline surveys and consultations focused on attempts to address these questions to prepare the ground for training activities directed at the staff of the regional commodity groups. The capacity building efforts and strategies must be comprehensive enough to account for the fact that cross-border

trade practitioners are rarely specialized and their basic needs often cover diverse areas including credit, transport, storage, market information and insurance. While some may just be surviving under disguised unemployment, others may be quite sophisticated, commercially and technologically.

8.2 Strategies that were applied to build capacity of EAGC and HCA

The main thrusts of collaboration with the East African Grain Council (EAGC) and the Horticulture Council for Africa (HCA) can be summarised as follows:

a) Participation in design of field work and data collection methods and instruments

During the preparation of the instruments and design of data collection methods, both EAGC and HCA senior staff were invited to participate in discussions and research planning workshops held in Nairobi. The representatives of EAGC and HCA participating in these workshops actively participated in developing the checklists and questionnaires used in the field work. They also participated as trainees in a two-day training workshop for corridor mapping and data elicitation using the value chain questionnaire.

b) Participation in field data collection and analysis

During data collection EAGC and HCA provided research assistants who accompanied the MA/REMPAI researchers in the field. EAGC in particular provided three assistants for data collection in Uganda, Tanzania, Burundi and Kenya. After being trained in the field during the initial days, the personnel from EAGC and HCA were able to collect data on their own just like the research assistants from MA/REMPAI. They were also engaged in writing preliminary corridor mapping reports that were later used for sampling individual market actors in the corridors. Further, they trained border monitors at the various border points and supervised collection of informally traded commodity volumes and prices. In the MA/REMPAI offices, data analysts from EAGC and HCA actively participated in data entry and analysis for a period of two months.

c) Sharing of research documents and data

EAGC was very instrumental in this aspect as it had already been involved in empirical research on cross-border trade of grains and pulses. When MA/REMPAI was developing research instruments, EAGC provided contacts of consultants and organizations that have interests in research on cross-border trade, including the materials they have been using. Through initiatives of EAGC the consultant was also able to get data from UBOS, FEWSNET, and other organizations/researchers. This close working relationship with EAGC greatly facilitated development of high quality research methods that are acceptable to other regional trade and research stakeholders and partners. In return, EAGC benefited from the experience of consultants and was able to address some the limitations it has been experiencing in its past research on cross-border research. For instance, the issue to tracking origin and destination of cross-border commodities was comprehensively addressed during these exchanges.

d) Joint preparation of potential investments and dissemination and policy advocacy materials in the region

Both EAGC and HCA were actively involved in brainstorming sessions that identified the potential investments documented in the report. This was important since they are among the lead organizations that will spearhead the implementation of the proposed investments. They were also actively involved in the writing of the report and particularly in justifying relevant policy issues that related to cross-border trade of food commodities.

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ANNEX: Potential investments to facilitate cross-border trade

CATEGORY I: Investments where Nile Basin Initiative (NBI) can play a lead coordinating role

Project 1	Improving water transport and landing sites on Lake Victoria
Summary (type, goals, components, and expected impacts/benefits)	<p>Main components: i) innovative credit financing for different market players ii) modernization of landing beaches and placing their management in capable local hands; iii) improving security in the water transport operations; iv) modernization of the transport system and rationalization of water transport of fruits & vegetables and food grains with other modes of transport v) harmonization of transport and productivity enhancing policy strategies and initiatives around the Lake</p> <p>The main benefits: increased competitiveness, transport efficiency and reduction of post-harvest losses; improved linkage of supply and deficit/consumption areas; reduced vehicular strain on roads; increased employment opportunities; incentives to local producers of fruits & vegetables and grains; ease of access to financing.</p>
Regional/Country Context (constraints addressed; how it fits into policy goals and strategies)	Constraints addressed: unemployment and poverty among households dependent on water based livelihoods; underutilization of the Lake water resource (e.g. for irrigation of fruits and vegetables); poor road transport linkage of the countries around the Lake; high concentrations in the water transport business due to lack of resources to acquire modern transport equipment; and high post-harvest losses.
Main stakeholders (drivers and those likely to benefit)	Agro-processors and exporters; transport operators; suppliers of transport equipment; local county councils; government security agents; ministries of agriculture; banks, plant health inspectors
Countries to benefit	EAC countries, South Sudan and DRC
Implementation arrangements	The proposed investment components are complimentary but the initiatives targeting improvement of landing beaches, financing and security should have priority. There will be need for a pre-feasibility study
Timeframe	5 years
Estimated cost	Pre-feasibility study, trade experts reimbursables and logistics (22 man-months) = 303,000 Workshops = USD 120,000; TOTAL = USD 423,000

Project 2	Strategic earth dams along livestock marketing corridors
Summary (type, goals, components, and expected impacts/benefits)	<p>Main components: (i) feasibility studies to identify suitable sites along the live livestock corridors, (ii) construction of recommended standard size dams at strategic points along the livestock trade corridors, (iii) commissioning of the dams, and (iv) building the capacity of communities living along the corridors to maintain the dams</p> <p>Benefits: increased access to water by livestock and households, availability of water for pasture production and conservation, limited crop production through irrigation, reduced water-related conflicts, general environmental conservation, healthy and better quality animals which fetch higher market prices, and increased trade in live livestock</p>
Regional/Country context (constraints addressed; how it fits into policy goals and strategies)	<p>Much of the rainfall in pastoral areas in the region goes to waste through evaporation and run-off. This water could be captured in earth dams for use in livestock production, small-scale agriculture and for domestic use.</p> <p>The lack of water and pasture force livestock to walk long distances and in the process lose body condition thereby fetching low market prices. Many national development and strategic plans of the countries along the live livestock corridors express the need to avail adequate and good quality water for livestock and domestic use through water harvesting as a simple and low cost water supply technique in arid and semi-arid areas. Construction of earth dams</p>
Main stakeholders (drivers and those likely to benefit)	Government, civil society organizations, communities, AU/IBAR, NBI, IGAD, private sector (e.g., livestock marketing associations and exporters)
Countries to benefit	Kenya, Ethiopia, Sudan (including South Sudan) and Egypt and their trade partners in live livestock
Implementation arrangements	The construction of the earth dams should go hand-in-hand with soil and water conservation to foster sustainability. Beneficiary communities should participate in planning and implementing the project, either through direct contribution of labour, land or cash. Each country in the livestock corridor could construct its own set of earth dams. NBI to coordinate the national efforts to ensure concurrence. Prefeasibility study will be required, including services of a civil engineer and trade economist.
Timeframe	Two 5-year implementation periods
Estimated cost	Pre-feasibility study, reimbursable costs and logistics (23 man-months) = USD 317,000; workshop = USD 120,000; Total = USD 437,000

Project 3	Strategic storage facilities for grains, fruits and vegetables
Summary (type, goals, components, and expected impacts/benefits)	<p>The storage facilities to be located in major production areas and along the commodity trade routes</p> <p>Components: i) Dry storage facilities for maize, rice, beans and Irish potatoes; ii) Cold storage facilities for bananas, passion fruits and pineapples, and Irish potatoes</p> <p>Through this project, trade of grains/pulses, vegetables and fruits will be enhanced; incomes from agriculture increased, and food security in the region will be ensured.</p> <p>Main benefits: reduce spoilage and wastage, manage price fluctuations/variability between seasons; ensure food security in deficit countries/areas; regularize food supply and increase accessibility; ensure quality is enhanced and maintained throughout the year; and increase incomes of producers</p>
Regional/Country Context (constraints addressed; how it fits into policy goals and strategies)	<p>The target regions have poor road and market infrastructure, experience regular price fluctuations between seasons, and lack food safety and packaging standards. Moreover, there are poor or no storage facilities in the markets situated in the production areas and trade routes. The project will therefore address these constraints and ensure that the regions are self-sufficient in food supply. In addition, the project will encourage efficient use of water as farmers will produce throughout the year</p>
Main stakeholders (drivers and those likely to benefit)	<p>The drivers of this project will be Nile Basin Initiative countries and Regional Commodity Groups such as Horticultural Council of Africa (HCA) and East African Grain Council (EAGC). Sustainability of the project will be ensured by HCA and EAGC. The ultimate beneficiaries are the member countries and their populations. Specifically, farmers will receive good prices throughout the year and consumers will have their food and dietary needs met. Women and youth will be employed in the storage facilities to perform different duties: sorting and grading, packaging, quality control, and management</p>
Countries to benefit	<p>Egypt, Sudan, South Sudan, Ethiopia, Kenya, Tanzania, Uganda, Rwanda, Burundi, D.R. Congo and the Private Sector</p>
Implementation arrangements	<p>Pre-feasibility studies will be required, followed by meeting/workshops of NBI countries, HCA, EAGC and other actors</p>
Timeframe	<p>3 years</p>

Project 4	Agricultural trade training centre
Summary (type, goals, components, and expected impacts/benefits)	<p>The curriculum will comprise theory lessons, applications and internship sessions</p> <p>Indicative learning topics to include: introduction to economics and basic concepts of international trade; introduction to commercial languages of the Nile riparian states (English, French, Arabic, Swahili); political economy of Nile Basin countries and their trade policies; concepts of regional integration and global finance and trade (tariffs, NTBs; exchange rates; the WTO etc); food safety and standards; transport and communication management; water use in trade & markets; investments and resource mobilization; ware-house receipting; auction markets; commodity value chain analysis; market research and analysis; laws of contracting; certification for food quality (e.g. organic foods); managing climate change impacts; conflict management and adaptation; insurance</p> <p>Main benefits: better understanding of trade related policies and benefits, and factors influencing them through practice oriented training</p>
Regional/Country Context (constraints addressed; how it fits into policy goals and strategies)	Lack of specialized skills and knowledge in trade, transport and agro-processing
Main stakeholders (drivers and those likely to benefit)	Staff in regional institutions such as customs, revenue collection, plant health, security, bureau of standards, universities, agro-processors, transporters, RECs, etc
Countries to benefit	ALL
Implementation arrangements	<p>One year Diploma course offered in an intensive modular coursework, internship and project paper</p> <p>Administered by EAGC but housed in one of the Nile Basin country universities</p>
Timeframe	5 -10 years
Estimated cost	Main cost categories: Pre-feasibility study to assess: i) Legal and other establishment components and requirements; ii) physical infrastructure needs iii) staffing requirements; iv) modes of training and attachment; and v) demand and sustainability. Consultancy services (4 man-months) and related costs = USD 66,000; workshop =USD 60,000; Total = USD 126,000

Project 5	Wet agro-processing for grains
Summary (type, goals, components, and expected impacts/benefits)	<p>Pilot wet agro-processing infrastructure for the cottage industry producing oil from corn and pulses by women and youth. Four components are critical, namely: i) delivery of physical infrastructure (e.g. work spaces and storage); ii) machinery and equipment; iii) financial services; and, iv) training of beneficiaries and marketing (agro-processing skills, market analysis and linkages with other players and market outlets)</p> <p>Main benefits: Production of oil from corn and pulses serves a number of purposes that are central to national food security and poverty eradication strategies in the Nile Basin: i) value addition at the farm level and employment creation especially for women and youth; ii) import substitution; and, iii) increasing supply of edible oils in the rural areas increases access to these products at affordable prices and hence contributes towards improved diets and nutrition among the rural poor households.</p> <p>The pilot project would also create additional employment opportunities and incomes through associated local fabrication of machinery and tools as well as repairs</p>
Regional/Country context (constraints addressed; how it fits into policy goals and strategies)	The main constraints are usually lack of technical agro-processing skills among potential entrepreneurs and financial resources to purchase the necessary equipment and machinery. The goal of the national policies in the long run is to increase agricultural productivity of grains and pulses and this particular investment acts as a means of creating markets for expected marketable surpluses and minimizing post-harvest losses and low prices that follow gluts in supply
Main stakeholders (drivers and those likely to benefit)	EAGC and the private sector
Countries to benefit	Uganda, Kenya, Tanzania, Rwanda, Burundi, D.R Congo; and Private Sector-Horticultural Council of Africa
Implementation arrangements	Pre-feasibility and feasibility studies recommended
Timeframe	3 years
Estimated cost	Consultancy services (5.5 man-months) and related costs = USD 76,000; workshop =USD 60,000; Total = USD 136,000

Project 6	Wet agro-processing for fruits
Summary (type, goals, components, and expected impacts/benefits)	<p>This investment comprises two different components: a) Agro-processing infrastructure for production of juice; and, b) Pilot agro-processing infrastructure for producing banana wine by women and youth. The technical aspects are the same as in the case of agro-processing for corn and vegetable oils, namely: i) physical infrastructure (e.g. work spaces and storage); ii) machinery and equipment; iii) financial services; and, iv) training of beneficiaries and marketing (agro-processing skills, market analysis and linkages with other players and market outlets).</p> <p>Benefits: i) value addition at the farm level and employment creation; ii) import substitution; iii) reducing post-harvest losses; and, iv) promoting commercialization among smallholder producers or fruits</p>
Regional/Country context (constraints addressed; how it fits into policy goals and strategies)	<p>Some of the constraints addressed are post-harvest losses and hence low productivity; low levels of commercialization and market access; low value addition closer to regions of surplus production leads to high costs as bulky fruits are transported for long distances to processors based in urban areas. Juices are in high demand due to increased incomes and awareness about nutritional well being. The per capita consumption of fruits in the Nile Basin, as in other parts of Sub-Sahara, falls below recommended levels despite positive signs of growing per capita incomes and increasing urbanization that should give some impetus to dietary changes.</p> <p>Except for success stories relating to Tanzania, the Nile Basin is not well known for wine production and there are no studies to show whether or not the region has comparative advantage in the production of wine, especially compared to South Africa which is one of the major wine exporters. The quest for increasing banana wine in the region derives largely from the untapped potential for increasing banana production, high post-harvest losses, limited value addition and commercialization and a long history of producing traditional alcohols from banana (for example in Rwanda, Burundi and Uganda).</p>
Main stakeholders	Private Sector and Horticultural Council of Africa. The main beneficiaries will be producers and entrepreneurs in major producing areas/countries. Juices are beneficial medically and nutritionally so consumers of different categories will benefit as well as children and those vulnerable to diseases and vitamin deficiencies (children and expectant mothers)
Countries to benefit	Uganda, Kenya, Tanzania, Rwanda, Burundi, D.R. Congo
Implementation arrangements	Pre-feasibility and feasibility studies recommended
Timeframe and estimated cost	Timeframe of 3 years. Consultancy services (banana wine 5.5 + fruit juice 11.0 = 16.5 man-months) and related costs = USD 250,000; workshop =USD 70,000; Total = USD 320,000

Project 7	Wet agro-processing for livestock
Summary (type, goals, components, and expected impacts/benefits)	<p>Cottage industries producing cheese, ghee and blood products</p> <p>Main aspects to target with investment: i) physical infrastructure (e.g. work spaces and storage); ii) machinery and equipment; iii) financial services; and, iv) training of beneficiaries and marketing (agro-processing skills, market analysis and linkages with other players and market outlets)</p> <p>Benefits: i) value addition at the production level; ii) employment creation; iii) meeting demand in niche markets; and, iv) achieving social equity by empowering women and youth especially among traditional livestock producing communities</p>
Regional/Country context (constraints addressed; how it fits into policy goals and strategies)	<p>The main concern to be addressed by this project is the historical marginalization of women and the youth in livestock producing areas of the Nile Basin. The region's livestock supply relies on pastoral production whose proceeds are largely controlled by men despite the important roles played especially by the youth in herding and watering of the animals. Putting incomes in the hands of women and youth in these pastoral areas will go a long way in terms of meeting some of the Millennium Development Goals (especially on poverty reduction, nutrition and access to education and health facilities) – these are important policy goals for all governments in the region.</p> <p>Due to the fact that live livestock are usually transported closer to major consuming areas for slaughter, the producers miss out on many value addition aspects to be addressed by the proposed investments. The communities have the traditional knowledge for making cheese and ghee and blood is customarily consumed as part of the people's local diets. The main problem is how to scale up production and commercialization of the products by promoting use of more efficient equipment, proper packaging/branding, linkage to larger processors and search for niche markets in the region and abroad. Bringing slaughterhouses closer to production areas (decentralization for which stakeholders are agitating for in Kenya) will make the cottage industries more profitable and sustainable but raises other challenges.</p>
Main stakeholders (drivers and those likely to benefit)	Private Sector; Nile Basin Livestock Marketing Association. Women and youth will benefit but this should not be taken for granted as they could be relegated to simply providers of cheap labor as larger entrepreneurs move in depending on profitability and complexity of marketing arrangements that may emerge as the project goes beyond pilot stages
Countries to benefit	Egypt, Sudan, South Sudan, Ethiopia and Kenya
Implementation	Pre-feasibility study to assess: production and consumption trends; projected demand in niche markets; competitiveness of products from cottage industries; and, potential form increased cross-border trade
Timeframe and Estimated cost	Timeframe of 5 years. Consultancy services (5.4 man-months) and related costs = USD 75,000; workshop =USD 25,000; Total = USD 100,000

CATEGORY II: Investments requiring collaboration between NBI and other regional partners

2.1 Fruits and Vegetables

Project 8	Regional Seed Multiplication Centers
Summary (type, goals, components, and expected impacts/benefits)	Covering three components: banana, passion and Irish potato
Regional/Country context (constraints addressed; how it fits into policy goals and strategies)	Awareness creation about the need for clean planting seeds is already created but individually the 'small country' phenomenon locks out private investors who are unable to enjoy economies of scale due to low domestic demand. By exploiting existing research capacity and an assured regional market, the venture can be made economically viable. In some cases, pilot projects already exist and are supported by NGOs or through government funds. The high demand for juices and potatoes and the many uses of banana (e.g. wines, cakes, flour for porridge, etc) at the moment provide incentives for increased production.
Main stakeholders (drivers and those likely to benefit)	Smallholder producers; transporters; processors and national research institutes (NRIs)
Countries to benefit	Passion center in Burundi; Irish potato in Kenya; and Banana in Uganda: these countries will benefit directly for example through employment creation but other Nile Basin countries will benefit through increased supply of the commodities and value added products
Implementation arrangements	NBI and private sector organizations and research centers like NRIs, CIP, IITA
Timeframe	5 years for initial sites and for up-scaling ongoing country programs
Estimated cost	9 replication sites in 3 countries @ site US\$ 10 million; and 1 main multiplication center in Kenya @ US\$ 20 million = US\$ 110 million

Project 9	Good Agricultural Practices (GAP) System
Summary (type, goals, components, and expected impacts/benefits)	Increase quality, value addition; increase food safety and standards, facilitate traceability and efficient management of market information
Regional/Country Context (constraints addressed; how it fits into policy goals and strategies)	The system will form part of the global market access strategy but it will also enhance regional trade and increase efficiency in production through vertical integration with international exporters and regional supermarkets; access to financing and managerial skills
Main stakeholders (drivers and those likely to benefit)	Producers will increase their efficiency; large regional urban supermarkets will procure safe and standard products
Countries to benefit	Head office in Rwanda and country desks/ offices in all Nile Basin countries
Implementation arrangements	HCA; RECs; farmer groups; horticulture marketing/development authorities; bureaus of standards; ministries of agriculture, plant health inspectorates
Timeframe	2 years to set up
Estimated cost	2 years setting up 9 country offices = US\$ 18 million for advocacy, training, communication; coordinators/experts; 2 years head office expenses @ US\$ 1.5 million = US\$ 3 million. Total US\$ 21 million.

2.2 Grains and Pulses

Project 10	Grains Electronic Market (e-Market)
Summary (type, goals, components, and expected impacts/benefits)	<p>The e-Market can be ICT based and in the initial stages will be modelled after the e-SOKO that is currently operational in selected countries in West Africa and East Africa. Other similar approaches are Kenya Agricultural Commodity Exchange (KACE) and DrumNet in Kenya; Busoga Rural Open Source and Development Initiative and FoodNet in Uganda; Malawi Agricultural Commodity Exchange (MACE) in Malawi; TradeNet/E-Soko in Ghana; and, Kilosa Rural Services and Electronic Communication in Tanzania. The programs have been mostly on a pilot basis and many encountered financing and sustainability challenges. The proposed investment is intended to scale up the existing ventures in countries such as Kenya and Uganda by providing the necessary financial resources, telecommunication infrastructure; efficient transport network; established grains standards (proposed investment); regulatory system; and, insurance mechanisms</p> <p>Benefits: The core business of the e-Market is to link buyers and sellers by providing accurate and timely market information; improved market integration; elimination of market information asymmetries and particularly for rural smallholder producers and traders, raising their bargaining power and incomes; and reduction of transactions costs. It can facilitate more optimal coordination of grain stocks and thus allow countries to track their food balance sheets and strategic reserves</p>
Regional/Country context (constraints addressed; how it fits into policy goals and strategies)	<p>Major weaknesses in the Nile Basin grains markets that would be addressed include: high transactions costs; poor market participation by smallholder producers and their exploitation by middlemen, traders and money lenders who tend to have an upper hand in terms of knowledge regarding price trends and supply and demand conditions in distant regions; co-existence of gluts and deficits in different parts of the Nile Basin. This would be part of the wider government goals of poverty reduction and empowerment, especially for rural women whose other domestic chores do not allow adequate time for travel and search for key determinants of price formation and seasonality. The investment would also be in the interest of EAC and COMESA as they strive to improve cross-border trade flows and elimination of physical and communication related barriers</p>
Main stakeholders (losers and winners)	<p>i) Governments to play a major role in: absorbing initial risks and funding of lumpy infrastructure (such as satellites) and legislations needed for mounting ICT services; attracting international investors and service providers and, where necessary, allocating land for businesses; and providing rural electrification and supporting affordable insurance programs; ii) Large telecom operators and internet service providers to host the platform; iii) Private sector agents to manage rural service centers; iv) EAGC and other commodity groups</p>
Countries to benefit	ALL
Implementation arrangements	<p>Through public/private sector partnerships; telecommunication and internet connectivity constitute a key prerequisite for scaling up, eventual profitability for operators and sustainability. In earlier launching stages there is a need for training of grassroots agents and service providers and ironing out issues to do with language barriers and legislations (especially their harmonization). A soft landing approach would be to scale up existing platforms such as KACE and e-SOKO</p>
Timeframe	5 years for support to up-scaling of current private sector initiatives
Estimated cost	Pre-feasibility study, reimbursable costs and logistics (15 man-months) = USD 207,000; workshop = USD 80,000; Total = USD 287,000

Project 11	Regional Maize Standards 2013
Summary (type, goals, components, and expected impacts/benefits)	<p>The main aspects of quality standards define acceptable levels of: i) moisture content (percent); ii) Foreign matter, broken grains and filth; iii) inorganic matter and discoloration; iv) proportion of pest damaged; v) rotten and diseased grains; vi) immature and shriveled grains; vii) aflatoxin in accordance with the relevant ISO standard</p> <p>Main benefits: Having standards is part of value addition. It raises producer incomes; obviates the need to undertake physical inspection of commodity consignments offered for sale, especially in intraregional trade; and can be a useful dimension in dispute resolution/arbitration. It also a form of product differentiation where premiums are paid for consignments meeting the set standard, but it can also be the threshold that forms a basis for price negotiation whereby, for instance, buyer and client can mutually agree on compromised standards and prices. Adoption and adherence to quality standards highly reduces the costs associated with actual value addition (processing) and thus by extension the consumer price of the processed goods.</p>
Regional/Country Context (constraints addressed; how it fits into policy goals and strategies)	<p>The main constraints addressed are: lack of a clear framework by national as well as regional authorities to enforce adherence is a major impediment to adoption; tendencies of some value chain players' eagerness to bend the rules has compromised prospects for adoption of high quality standards as producers with substandard goods somehow find takers.</p>
Main stakeholders (losers and winners)	<p>EAGC, Traders, exporters, standards inspectors (e.g. KeBS in Kenya and other national standards bureaus); processors development partners</p>
Countries to benefit	<p>ALL</p>
Implementation arrangements	<p>Awareness creation among all players along the value chain to create awareness for quality and standards Emphasis on GAPs-quality standards must begin at the production level Regional multi-stakeholder framework to oversee implementation of standards Cooperation among Standards Bureaus in order enforce adoption</p>
Timeframe	<p>The process of agreeing on acceptable standards can take about 5 years. However creation of awareness among players as an initial step to help bring everyone on the same page and appreciation of the place of quality standards in regional trade could help expedite the subsequent steps</p>
Estimated cost	<p>Timeframe of 2 years. Consultancy services (5.4 man-months) and related costs = USD 75,000; workshop =USD 25,000; Total = USD 100,000</p>

2.3 Livestock

Project 12	Towards achieving livestock disease-free zone (DFZ)
Summary (type, goals, components, and expected impacts/benefits)	<p>The main features of the NB/DFZ will be: a standard format for animal identification/branding; animal quarantines in strategic locations; building vet capacity in all countries and improving inter-agency collaboration to enable effective disease control and surveillance as well as rapid response to natural disasters and disease outbreak; harmonization of regulations governing movement of livestock across-borders.</p> <p>The rationale for a broad based/regional DFZ derives for the difficulties currently being encountered in mounting country based zones that are not well guarded by natural geographical features such as mountain ranges, lakes and rivers and informal movements of animals in and out of 'unsafe' areas across the borders; and the high cost of securing the designated zones, for example using electric fences.</p> <p>The benefits of a DFZ include improvement in efficiency; higher product quality and safety; access to export markets; and linkages to other sub-sectors in the livestock industry, including: hay bulking, feed lots-fattening; economically viable export-compliant abattoirs; related agro-processing and cottage industries</p>
Regional/Country Context (constraints addressed; how it fits into policy goals and strategies)	<p>National strategic plans for the livestock sectors aim at addressing the following main constraints are: lack of competitiveness and poor market access due to low quality livestock and livestock products (LLPs); declining supply of LLPs due to degradation of the rangelands, climate change and demographic changes such as rapid urbanization; unproductive animal breeds; insecurity in main pastoral production areas; and, inability of the sector to meet rising demand for LLPs as population and per capita incomes increase.</p>
Main stakeholders	<p>Livestock marketing associations, government and private sector slaughter houses, exporters, feedlots, Vet departments, animal breeders,</p>
Countries to benefit	<p>Eastern Africa countries where natural geographic barriers make it conducive to mount an OIE approved DFZ that is also cost effective, sustainable and has linkages that lead to job creation (i.e. EAC countries plus South Sudan and Ethiopia). Including Sudan, DRC and Egypt could lead to logistical problems especially with regard to movement controls and disease surveillance and control; they could however be brought in at later stages.</p>
Implementation arrangements	<p>The implementation strategy for the DFZ must take into account its economic viability (that is, what will be the benefits compared to the costs). If the economic viability assessment fails to justify a fully fledged DFZ in the Basin, other practical options could be explored.</p> <p>OPTION I: Investments in DFZs are usually based on the concept of getting rid of hazards rather than the risk posed from the hazards. The principle of <i>equivalence</i> is already embedded in OIE regulations and this allows countries to use other risk minimizing strategies for access to markets, e.g. commodity-based trade (CBT).</p> <p>OPTION II: Invest on creating <i>compartments</i> that are easier to manage, e.g. for smaller stock; doing this for cattle may still encounters serious challenges. OPTION III: Promote access to regional livestock markets that currently face several constraints including poor infrastructure, policy harmonization and lack of goods for back-haul.</p> <p>OPTION IV: Mount a step-wise approach towards achieving a regional DFZ, e.g. starting with a) animal branding; b) universal vaccination against the most troublesome TADs.</p> <p>Mounting of a DFZ (or the options suggested above) is a public good for which the governments must play a lead role. Incentives should be provided to the private sector and FDI to initiate investments in animal feeds, feedlots, abattoirs and other related agro-processing industries.</p>
Timeframe	<p>Two 5-year implementation periods</p>
Estimated cost	<p>Timeframe of 5 years. Consultancy services (20 man-months) and related costs = USD 206,000; workshop =USD 75,000; Total = USD 281,000</p>

Project 13	Strategic Livestock and Livestock Products (LLP) processing hubs
Summary (type, goals, components, and expected impacts/benefits)	<p>Key components include: i) export rated abattoirs; functional sale yards and related infrastructure near the abattoirs (e.g. water, labs, phone and internet connectivity), and cold storage. ii) Individual countries should aim at raising animal productivity by upgrading animal breeds in their pastoral areas; investing in earth-dams and water pans; establishing holding grounds; quarantines; reseedling of rangelands; and promoting irrigated fodder production and harvesting and storage of hay; iii) Other value added production and commercial ventures: animal feeds processing; horn and leather products; animal products for niche markets (e.g. goat milk and cheese; camel milk and cheese).</p> <p>Benefits relate to employment creation; diversification of incomes in pastoral areas thus ensuring food security; commercialization of animal production leading to higher incomes; proximity to production areas will facilitate better responsiveness to natural disasters such as droughts that often lead to massive animal deaths and asset depletion among households dependent on them for livelihood. There are also benefits that arise from sale of animal based artefacts to tourists and this leads to employment creation and making the regions more attractive as regional tourist stop-overs.</p>
Regional/Country Context (constraints addressed; how it fits into policy goals and strategies)	<p>The main thrust of this investment is commercialization of livestock production and value addition. It is highly complementary to the proposed Nile Basin disease free zone and country efforts to diversify income sources and create employment opportunities, especially among women and youth, in traditionally livestock producing areas. Locating the investment in strategic areas of the Nile Basin allows use of other infrastructural facilities like ports, and exploitation of economies of scale arising from proximity to livestock production (catchment) areas that historically have suffered neglect in terms of policy, infrastructure, education and health. The success of the investment (supply risk reduction) is contingent on success of policy efforts aimed at increasing rangeland productivity (increasing carrying capacity, upgrading animal breeds, improving security and infrastructure)</p>
Main stakeholders	<p>AU/IBAR; RECs, IGAD, Vet departments; Livestock marketing associations, Customs, agro-processors;</p>
Countries to benefit	<p>There will be secondary consumption and other multiplier benefits to all Nile basin countries but more benefits will accrue to countries with large livestock populations, notably, Ethiopia, South Sudan, Kenya, Uganda and Tanzania which are likely to host the processing hubs</p>
Implementation arrangements	<p>The hubs will be located in the following areas based on animal catchment potential:</p> <ul style="list-style-type: none"> a) Garissa, Kenya: to use Lamu port for export b) Kitale, Kenya: to serve growing urban markets in Western Kenya and parts of Uganda b) - Ethiopia: to use Djibouti port for export c) - South Sudan: d) Arusha, Tanzania: also serving parts of Kenya's South Rift rangelands and to use Tanga or Mombasa ports <p>Because of its commercial orientation and amenability, the role of governments will be quite specific and categorical: providing incentives for private sector and foreign investors, policy harmonization; infrastructure facilities such as roads and ports, land allocation; implementing complimentary investments aimed at raising animal production and husbandry methods and ensuring security</p>
Timeframe	<p>3 years</p>
Estimated cost	<p>Consultancy services (10 man-months) and related costs = USD 140,000; workshop =USD 65,000; Total = USD 205,000</p>









Nile Equatorial Lakes Subsidiary Action Program
Regional Agricultural Trade and Productivity Project
5th Floor Kigali City Tower, Avenue du Commerce, Kigali-Rwanda
P.O. Box : 6759; Tel: +250788307334
Fax: +250252580100; Url: www.nilebasin.org/nelsap