Food Market Demand & Competitiveness

East Africa Region Report

Analyzing food demand trends, competitiveness of domestic supply chains to develop strategies in enhancing trade flows of key food crops in Southern, East, and West Africa.

JULY 2021

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Acknowledgement

This report was prepared by Cardno in consortium with International Economics Consulting Ltd. The authors of the report are Veepin Bhowon, Paul Baker, Neetish Hurry and Pablo Quiles.

The objective of this consultancy is to inform AGRA (and indirectly its partners) on prioritizing and better targeting its interventions in terms of geography, food commodities and points of leverage in the market system per region to capitalize on latent opportunities to grow intraregional food trade.

This consultancy was funded by the UK Government's Foreign, Commonwealth & Development Office (FCDO)[1] through the Africa Food Trade & Resilience Programme. The opinions expressed in this report are those of the authors and do not reflect the official policy or position of the UK Government's FCDO, the Alliance for a Green Revolution in Africa (AGRA) and PIATA partners, their employees, or their affiliates in any way. While AGRA has made every effort to ensure the accuracy and completeness of the information entered in this report, we assume no responsibility for any errors, inaccuracies, omissions or inconsistencies included herein.

The authors would like to gratefully acknowledge AGRA staff, whose contribution in stimulating comments, suggestions and support has helped to improve this report. In particular, we would like to thank Dr. Apollos Nwafor (Vice President – Policy & State Capability, AGRA), Daniel Njiwa (Head – Regional Food Trade, AGRA) and Sunil Dahiya (Senior Program Officer – Markets Regional Food Trade & Resilience, AGRA) for their useful comments and suggestions throughout the study.

The authors would also like to thank Dave Watson (FCDO), who has been instrumental in providing useful comments and suggestions throughout the study.

Finally, we would like to thank all other people and institutions that have provided support in various ways towards the preparation of this report.

[1] *The programme started in 2019 under the Department for International Development, which merged with Foreign and Commonwealth Office to become FCDO on Sept 2 2020.*

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Acronyms

AfDB	African Development Bank
AGP-LMDP	Agricultural Growth Project – Livestock Market Development Programme
AGRA	Alliance for a Green Revolution in Africa
ARDP	Agriculture and Rural Development Policy
ARDS	Agriculture and Rural Development Strategy
ARIA	Assessing Regional Integration in Africa
ASAL	Arid and Semi-Arid land
ATNR	Agriculture, Tourism and Natural Resources
AU	African Union
AU-IBAR	African Union Inter-African Bureau for Animal Resources
CAADP	Comprehensive Africa Agriculture Development Programme
CAGR	Compound annual growth rate
COMESA	Common Market for Eastern and Southern Africa
DP	Development Partners
DRC	Democratic Republic of Congo
E3ADP	East African Agro-industry and Agro-enterprise Development Programme
E3AIS	The East African Agro-industry and Agri-enterprise Investment Strategy
EAC	East African Community
EAFF	Eastern Africa Farmers Federation
EALA	East African Legislative Assembly
EDF	European Development Fund
ESA REC	Eastern and Southern Africa Regional Economic Community
ETBC	Ethiopian Trade and Business Corporation
EU	European Union
EWURA	Energy and Water Regulatory Authority
FAO	Food and Agriculture Organization
FAW	Fall armyworm (Pest)
FCDO	Foreign, Commonwealth and Development Office
FSAP	Food Security Action Plan
FSNP	Food Security and Nutrition Policy
GAP	Good Agriculture Practices
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
HS	Harmonized System
IFPRI	International Food Policy Research Institute
IGAD	Intergovernmental Authority on Development
ILRI	International Livestock Research Institute
ITC	International Trade Centre
JEOP	Joint Emergency Operations Partners
JICA	Japan International Cooperation Agency
JKIA	Jomo Kenyatta International Airport
LGAs	Local Government Authorities
MALF	Ministry of Agriculture Livestock and Fisheries
MIFUGO	Ministry of Livestock Development, Tanzania

MIT	Ministry of Industry and Trade, Tanzania
MLN	Maize Lethal Necrosis (Pest)
NARCO	National Ranching Corporation
NDRMC	National Disaster Risk Management Commission
NEPAD	New Partnership for Africa's development
PSNP	Productive Safety Net Program
RASIP	Regional Agricultural Sector Investment Plan
RCA **RISP**	Revealed Comparative Advantage Regional Integration Strategy Paper
RVF	Rift Valley Fever Virus
SAAFI	Sumbawanga Agricultural and Food Industries Limited
SADC	Southern African Development Community
SDG	Sustainable Development Goals
SGR	Standard Gauge Railway
SME	Small and medium-sized enterprises
SPS	Sanitary and Phytosanitary
SSA	Sub Saharan Africa
SUA	Sokoine University of Agriculture
TAA	Tanzania Airport Authority
TAHA	Tanzanian Horticultural Association
TBS	Tanzania Bureau of Standards
TCAA	Tanzania Civil Aviation Authority
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TFDA	Tanzania Food and Drugs Authority
TPA	Tanzania Port Authority
TPRA	Tanzania Pesticide Regulatory Authorities
TRA	Tanzania Revenue Authority
TSB	tender stem broccoli
TTTFP	Transport and Transit Facilitation Program
UAE	United Arab Emirates
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USD	United States Dollar
VC	Value Chain
WB	World Bank
WFP	World Food Program
WTO	World Trade Organization

1. Introduction

Agriculture forms a significant portion of the economies of all African countries and, as a sector, it can contribute towards major continental priorities, such as eradicating poverty and hunger, boosting intra-Africa trade and investments, achieving rapid industrialization and economic diversification, sustainable resource and environmental management, and creating jobs, human security and shared prosperity. This is critically true today because close to 70% of the African population is involved in agriculture as smallholder farmers working on parcels of land that are, on average, less than two hectares. As such, agriculture remains Africa's surest bet for growing inclusive economies and creating decent jobs, especially for the youth. While its importance to the rural population is well documented, recent surveys suggest that agriculture is also the primary source of livelihood for 10% to 25% of urban households.

Agricultural exports are also a key source of revenue and foreign exchange earnings, as well as of inputs for the manufacturing sector. The agro-food sector is the biggest direct employer in the region. Population growth, rapid urbanization, rising income, and shifting diet habits suggest that demand for food in the region will increase as well. Despite the potential and vast opportunities, intra-regional trade in agriculture products remains consistently low compared to inter-continental trade. Market fragmentation, lack of infrastructure, monetary, tax, trade fragmentation and red tape for traders are some of the major constraints that limit the region's trade potential. There is a need to boost intra-regional trade in agriculture to counter potential negative impacts from the international market.

The present study has been carried out to support the Alliance for a Green Revolution in Africa (AGRA) in framing its future work plan in the context of the Africa Food Trade and Resilience Initiative. Its objective is to inform AGRA and its partners on prioritization and better targeting of its interventions in terms of geography, food commodities, and points of leverage in the market system to capitalize on latent opportunities in growing intra-regional food trade. The aim of the study is to provide the foundation for a framework to prioritize work on trade, infrastructure, energy, and investment along promising economic corridors with strategic significance to food and agriculture.

The methodology relies on a meta-analysis of publicly available information while mapping all relevant elements of the value chains of agriculture products in the selected countries. The geographical focus of the study is on the 14 countries[2] that possess natural complementarities in terms of agro-ecologies: complementary market sheds and the existence of trade infrastructure. The selection of product focus is based on a combination of several available or constructed indexes to create a balance between demand and supply. They include the current and forecasted demand, supply, imports, exports, price volatility, et cetera. The objective is to cater for food security, promotion of inter-regional trade and the consideration of essential aspects - such as resistance to climate change, and change in consumption patterns - in the selection of the top value chains.

This report is one of three regional reports under the study, covering five (5) countries in East Africa.[3] It is divided into nine sections; Section 2 provides an overview of the broader intra-regional trade and food security, highlighting the key trends and challenges experienced. Section 3 gives an overview of the major trade corridors as well as the planned development. Section 4 explains the methodology behind the selection of the top five value chains of interest for the region, while sections 5-9 delve deeper into the selected value chains by exploring the key patterns in production, consumption, and trade, the regional trade routes (where information is available), the stakeholders, key findings on competitiveness, and constraints. From there, recommendations are made in view of coping with the challenges.

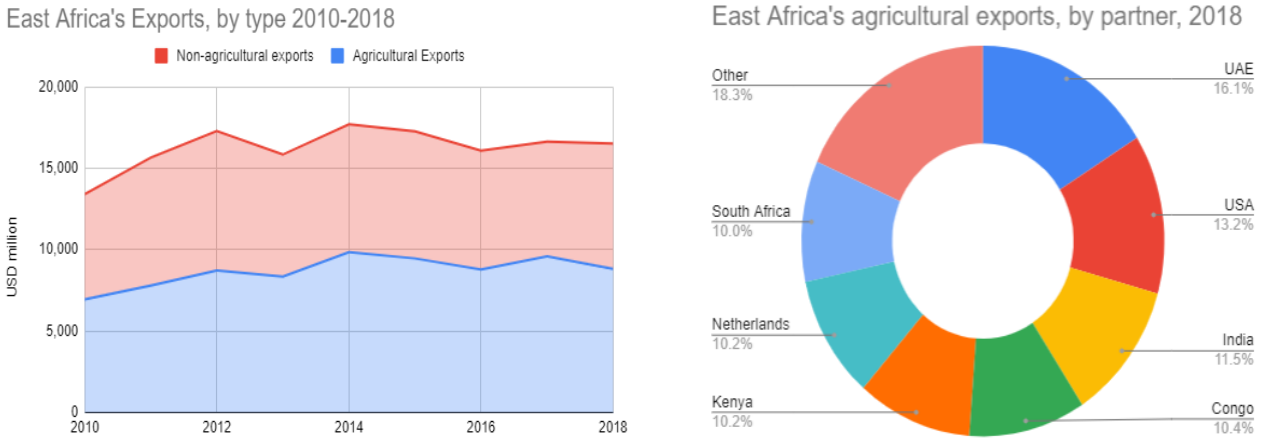
[2] Within the scope of this study, the focus countries are Mozambique, Malawi, Zambia, Kenya, Tanzania, Uganda, Ethiopia, Rwanda, Nigeria, Ghana, Mali, Burkina Faso, Ivory Coast, and Togo.
[3] The five countries are Ethiopia, Kenya, Rwanda, Tanzania, and Uganda.

2. Status of Intra-regional trade and food security

The agricultural sector is central to the economy of the East African region, being the source of livelihood for around 80 percent of its rural population. It also represents a significant source of foreign exchange earnings as well as inputs for the manufacturing sector. Agriculture is mainly rain-fed and dominated by smallholders.[4] The agro-food sector is the biggest direct employer among all industries in the region[5].

Agricultural exports are also a key source of revenue and livelihood for the region. Accounting for over USD 8.8 billion in 2018, agricultural exports (HS 01 to HS 24) represent more than half of the region's total exports. The region's top three markets are outside the African continent: United Arab Emirates (USD 1.3 billion), the United States (USD 1.1 billion), and India (USD 921 million). Congo and Kenya, however, appear in the top five, with total imports accounting for USD 836 million and USD 824 million, respectively.

Figure 1. East Africa's exports, by type (left) and East Africa's agricultural exports, by partner (right)



Source: ITC Trademap. Note: "East Africa" refers to the focus countries of this analysis, meaning: Kenya, Ethiopia, Uganda, Tanzania, and Rwanda

However, despite the close ties among countries in terms of regional integration, intra-regional food trade remains limited. Intra-regional exports in the whole East African Community (EAC) accounted for USD 2.6 billion in 2018, a 7.5 percent increase in comparison to the previous year. However, this only represents 16 percent of the region's total exports. Agricultural trade reflects the same story. Such a low level of integration is mainly due to the fact that despite being a relatively homogenous region with high chances of successful agricultural integration, national interests are usually stronger than regional priorities. Also, East African countries have often resorted to measures that go against promoting integration objectives.[6] As highlighted by Afun-Ogidan (2012), "*intra-regional trade in agriculture products, which is largely informal, is particularly hampered by the inconsistencies between partner states' trade and agriculture policies. Without harmonization of*

[4] WTO (2019). Trade Policy Review: East African Community. Report by the Secretariat. World Trade Organisation, Geneva.
[5] ECDPM (2017). Fabien Tondel, Understanding the political economy of the EAC in the agricultural sector Private sector ambitions facing political headwinds.
[6] Afun-Ogidan, D. (2012). Regional integration for food security in East Africa: the role of CAADP. GREAT Insights, Volume 1, Issue 4. June 2012. Maastricht: ECDPM.

national policies, there are no checks and balances to prevent situations where food deficits lead to hunger and famine or surpluses induce low food prices and economic losses for farmers."[7]

East Africa still faces numerous agricultural transboundary challenges that undermine food security and development, despite the existence of multiple intergovernmental organizations and policies that support the free movement of food. Annex 1 provides an overview of the common challenges facing the agricultural sector in East Africa, including:

Box 1. Key Challenges to Food Security and Intra-regional Trade in East Africa

Climate Variability	Conflict and Humanitarian Crisis
Changes in rainfall patterns, increasing surface temperature trends, and seasonal changes over the last 50 years are creating more significant challenges for a region that is already facing many developmental threats. Food insecurity in some countries may require the cross-border transfer of staples from countries with surplus crops. Regional standards and trade agreements help facilitate these transactions.	Despite security improvements, the region is challenged by religious, ethnic, and natural resource conflicts. Instability, insecurity, human rights abuses, and weak political and electoral systems are pervasive characteristics of Eastern and Central African countries, deeply affecting governance and the ability of citizens to voice their concerns and push for effective government actions. Conflict is a crucial driver of food insecurity and the dynamics around conflict shape the availability and affordability of food and the stability of the region to feed itself.
Political Economy	Sanitary and Phytosanitary (SPS) Protocols/Standards
Political economy issues remain a major challenge, including: 1) territorial protectionism; 2) elite revenue capture, mainly related to grain imports in the context of food insecurity; 3) lack of government funds to establish functional institutions to facilitate agricultural trade; and/or 4) lack of government recognition and action to promote the significant benefits of regional trade.	East Africa has suffered significantly from the spread of pests and diseases, including, the Fall Armyworm (FAW), Maize Lethal Necrosis (MLN), and the Rift Valley Fever Virus (RVF), which negatively impact regional food security. Similarly, foodborne hazards caused by bacteria, viruses, and other pathogens, such as aflatoxin, affect both animal and human health, impending the regional and international trade of agricultural products. Although the EAC adopts a regional SPS Protocol to help manage the impact of these threats, inconsistent and varying capacity for implementation of SPS processes and procedures based on International Standard-setting bodies at the country level remains a challenge to food safety and security.

Source: USAID (2019)

The role of the private sector is key to ensuring that food production surpluses reach those areas with food deficits. However, such a task is severely constrained in East Africa due to:

- *Limited information on market opportunities*, including products and awareness of existing buyers and sellers within the region, which hampers the development of business-to-business cross-border linkages, partnerships, and investment;

[7] Afun-Ogidan, D. (2012), *ibid*. This is despite the fact that the EAC is the most advanced regional economic community in terms of regional integration, having established a common market in January 2010 that provides for the free movement of goods, services, capital, labour and persons, plus rights of establishment and residence, and it anticipates introducing a common currency to replace the national currencies of member countries by 2024. See UNECA (2019). Assessing Regional Integration in Africa – ARIA IX: Next steps for the African Continental Free Trade Area. UNECA, African Union, African Development Bank, UNCTAD.

- *Limited logistics and trade services*, such as freight forwarding, warehousing, insurance, finance, and minimal competition, thereby creating bottlenecks and increasing costs;
- *Variation in standards, procedures and processes for trade and market access between countries*, limiting market size;
- *Limited access to finance and investment* capital, constraining trade opportunities; and
- *Non-compliance with standards and quality requirements,* posing a challenge to building active businesses that can collaborate, form partnerships, and seize market opportunities.[8]

These constraints have inhibited the rural economy's potential for alleviating poverty through employment creation and income generation, meeting growing food needs driven by rapid population growth and urbanization, stimulating overall economic growth - given that agriculture is the lead sector with the most potential for growth and development, and conserving natural resources.[9]

The region has a big potential to achieve food potential and meet its export-related objectives, both regionally and internationally. Despite the constant droughts, the region has vast amounts of arable land and variances in agro-ecological zones. If food grown in one area can flow readily via free trade to deficit countries, the region can wean itself from chronic dependence on emergency food assistance. Additionally, due to complementary production cycles and patterns across the region, grain deficits can be balanced by surpluses during every season.[10] For example, Kenya has had a structural food deficit while Tanzania and Uganda typically have surpluses of basic food commodities. Kenya is a chronic importer of maize, the demand of which could be met by Uganda and Ethiopia, the leading producers in the region. Theoretically, food deficits can be solved by having food surplus areas supply food deficit areas.[11] However, this situation is rarely achieved, mainly due to persistent protectionist tendencies including barriers to trade, such as export bans, border closures, quotas, etc., which have hampered the distribution of food between countries in the region. An overview of the regional policy for agriculture trade and development in East Africa is presented in Annex 2.

[8] USAID Feed the Future (2019). Global Food Security Strategy. East Africa Regional Plan 2019-2024. Feed the Future.
[9] EAC (undated). Constraints and challenges of the EAC Agriculture sector. https://www.eac.int/agriculture/livestock-and-fisheries.
[10] Assefa, Y. (2018). Africa Trading: Five Takeaways on Trade-Based Solutions for Food Security. DAI.
[11] Allen, S. (2012). Food security in East Africa from a trade facilitation perspective. GREAT Insights, Volume 1, Issue 7. September 2012. Maasttricht: ECDPM

2. Transport and Logistics across the region[12]

High transport costs and logistics barriers have been persistent obstacles. Transport costs in East Africa along the Northern Corridor are among the highest in the world: double those of the U.S. and a third higher than the better-performing African corridors. Whilst improvements have been made on the roads, rail transport in East Africa remains moribund and plays an insignificant role in trade in the region. Similarly, the major port in East Africa, Mombasa (Kenya), has operational efficiency problems. Although efforts to improve the situation are underway, such as the ones being implemented through TradeMark East Africa, progress has been slow. With the projected increase in trade, a crisis of major proportions will arise in the medium-term in East Africa unless supportive hard and soft infrastructure is urgently put in place.[13]

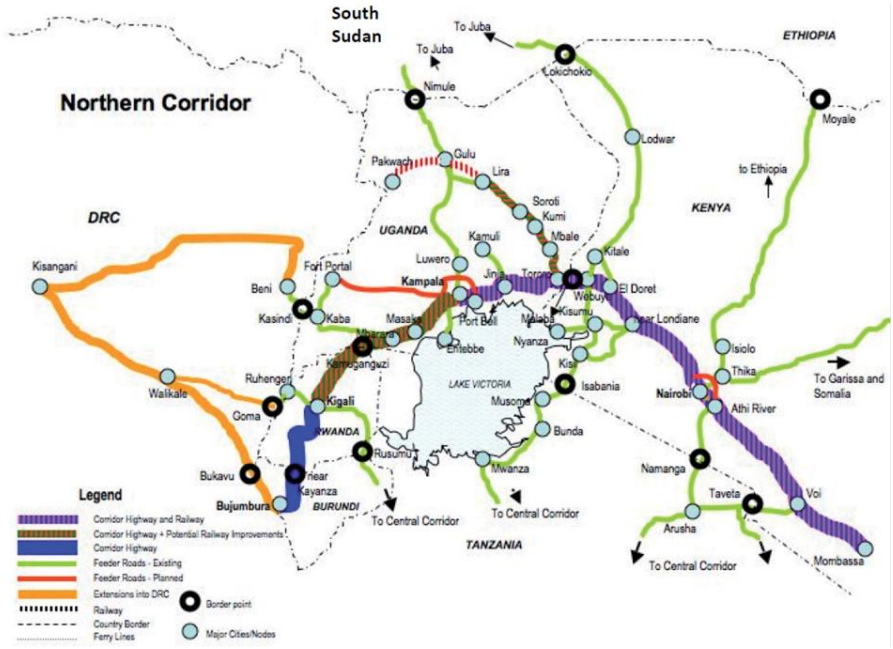
East Africa has two major multi-modal transport corridors - the Northern Corridor and the Central Corridor – connecting, respectively, the ports of Mombasa and Dar es Salaam to various landlocked countries.

The **Northern Corridor** (NC) is a multi-modal corridor, including road, rail, pipeline and inland waterways transport. This is one of the most significant logistics corridors in East Africa. The leading road network runs from the Mombasa Sea Port through Kenya, Uganda, Rwanda, Burundi, and across to the Democratic Republic of Congo (DRC). The road network also links Kenya and Uganda to South Sudan. The entire NC road network covers approximately 12,707 km in length, with the main arterial cargo highway running from the port city of Mombasa through Nairobi, Kampala, and to Kisangani, in eastern DRC. Tributaries branch off to Juba (South Sudan), Mwanza (Tanzania), Bujumbura (Burundi), and Kigali (Rwanda).[14]

The importance of the NC is increasing, and the current combined transit and trans-shipment traffic through the corridor has been growing at a rate of 20 percent annually. [15] Most of the transit of the corridor is one way, as 86 percent of the total traffic in the Port of Mombasa serves imports.[16] It should be noted that transit times have fallen over the last decade, in part as a result of massive regional programmes like those driven by TradeMark East Africa. However, there are some obstacles in the Northern Corridor, such as the weak infrastructure mentioned above, poor interconnectivity of modes, and long delays of cargo at the port and border posts.

[12] This section mainly obtained from JICA (2017). Project for Master Plan on Logistics in Northern Economic Corridor – Final Report. Japan International Cooperation Agency, March.
[13] Allen, S. (2012). Ibid.
[14] TTCANC (2020). Joint Norther and Central Corridors Performance Report. Northern Corridor Transit Transport Coordination Authority & Central Corridor Transit Transport Facilitation Agency. Available at http://www.ttcanc.org/documents/Joint_NCTTCA_and_CCTTFA_Corridors_Report_ENGLISH.pdf
[15] JICA (2017), i*bid*.
[16] TTCANC (2020), ibid.pp X.

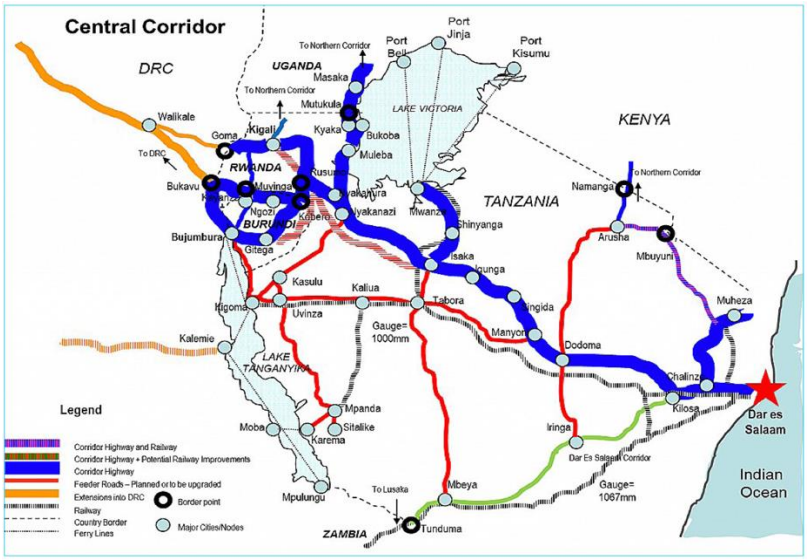
Figure 2 The Northern Corridor



Source: PMAESA (2016)

The **Central Corridor**, with a length of 3,100km, connects Dar es Salaam port with several countries, including Uganda, Rwanda, Burundi, eastern DRC, and northern Zambia. The Corridor consists of a network of road, rail, and lake transport systems, connecting Dar es Salaam with Burundi (via Kigoma or Isaka Dry Port to Bujumbura); DRC (via Kigoma/Kalemie on Lake Tanganyika); Rwanda (via Isaka to Kigali); and Uganda (via Mwanza to Port Bell/Kampala on Lake Victoria). The Central and Northern Corridors are linked through various road arteries that run through member countries.

Figure 3. The Central Corridor



Source: PMAESA (2016)

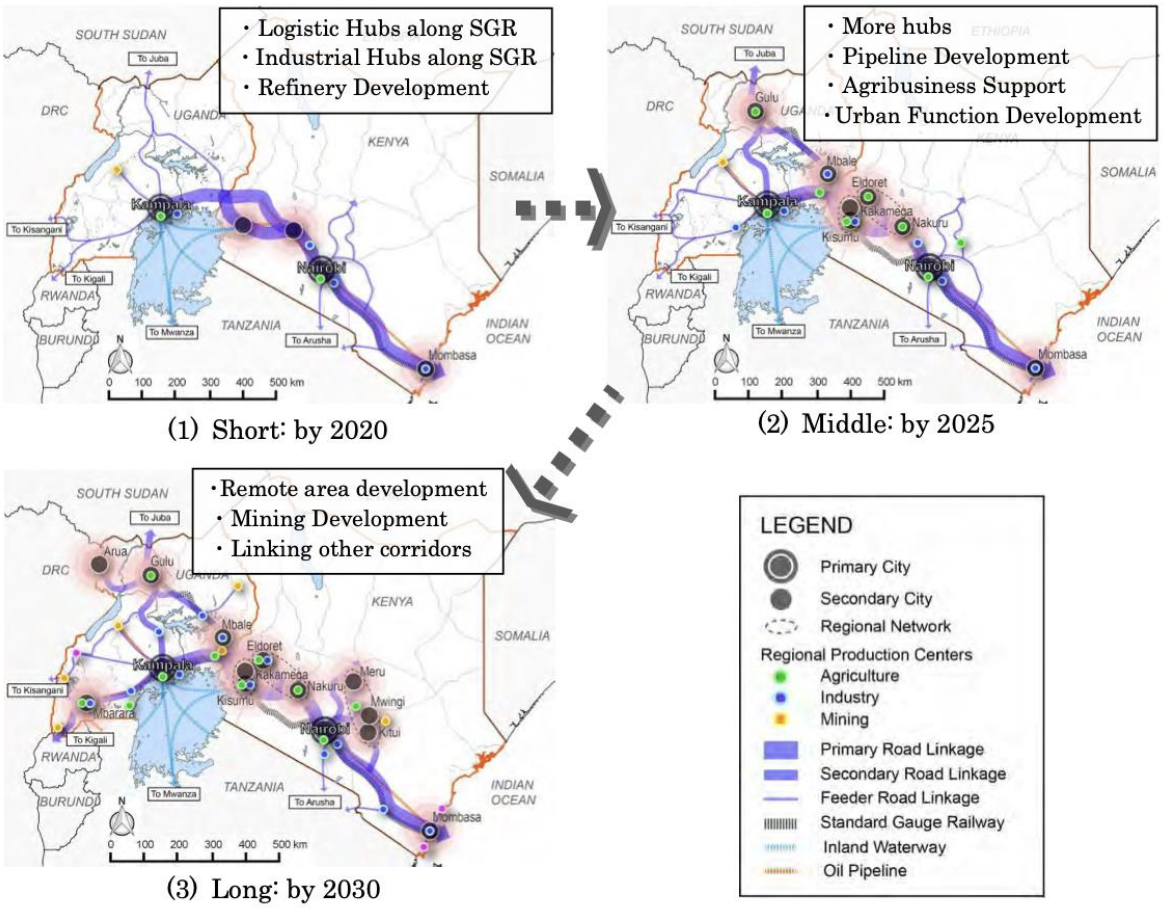
Logistics Master Plans: Northern Corridor

The master plan, prepared by the Japan International Cooperation Agency (JICA), foresees the development of a multi-core with Regional Industrial Development Type corridor, facilitating the expansion of exports with industrial promotion and balanced development. This corridor aims to

balance growth and efficient logistics in the region with promoting urban functions of "secondary cities".[17]

Based on the plans and surveys, the future spatial structure and development of the NC in 2020, 2025, and 2030 are illustrated below, highlighting the industry and key products of the Regional Production Centres, including agricultural ones:

Figure 4. Phase of Spatial Structure Plan - Northern Corridor



Source: JICA (2017)

Specifically, the implementation of the Standard Gauge Railway (SGR) is expected to have a large economic impact. The 485 km SGR line from the port of Mombasa to the Nairobi Inland Container Deport (ICD) is complete and in full use.[18] According to the schedule, the SGR will be extended to Uganda - from Mombasa - by 2025, along which more logistics and industrial hubs will be established. The emphasis on development will be shifted to remote regional cities away from the capitals by 2030 and connections with other corridors will be strengthened.[19]

[17] JICA (2017), ibid.
[18] TTCANC (2020), ibid., pp xii.
[19] JICA (2017), ibid.

Regional policy and funding of transport and infrastructure

EAC Vision 2050

The EAC Vision 2050, adopted in 2016, constitutes a blueprint for the mutual development of the region through improved regional integration. It identifies a series of pillars and enablers of the Vision, which include:

i. Infrastructure and a transport network that is easy, fast and cheap for both people and goods, driving regional competitiveness;

ii. Energy and information technology that is accessible to citizens;

iii. Industrialization built on the structural transformation of the manufacturing sector through high-value addition and product diversification based on the comparative and competitive advantages of the region.

AfDB projects

According to the AfDB Eastern Africa Regional Integration Strategy Paper (RISP) 2018-2022, infrastructure remains the top priority in the region's integration agenda. The RISP focuses on two pillars namely, (i) Regional infrastructure development for competitiveness and transformation, and (ii) Strengthening of policy and institutional frameworks for market integration, investment and value chain development.

The AfDB identifies missing links along major corridors and under-developed inland marine waterways. In line with the projected traffic volumes, AfDB underscores the need to upgrade selected highways into superhighways including the need to develop intermodal infrastructure around inland water.

The new projects to be approved under the new RISP 2018-22 will complement the AfDB's infrastructure investment during the previous RISP because most of the approved projects are still at the early implementation stage. In addition, the AfDB will enhance its collaboration with other developing partners, notably the European Union, World Bank, JICA, TradeMark East Africa, FCDO and USAID, to leverage complementarities and pursue co-financing opportunities for enhanced scale and impact.

The COMESA, EAC, and SADC Tripartite Transport and Transit Facilitation Program

Another important regional initiative impacting the East and Southern African countries is the COMESA, EAC and SADC Tripartite Transport and Transit Facilitation Program (TTTFP). This programme, launched in 2017, is relevant for the Agenda 2030 and contributes to the achievement of Target 9 from the Sustainable Development Goals. The main aim of the project is to facilitate the development of a more competitive, integrated and liberalized regional road transport market in the Tripartite region. The project's purpose is to develop and implement harmonized road transport policies, laws, regulations and standards. The target is to achieve efficient cross-border road transport, transit networks, and logistics services, systems and procedures in the Tripartite region.

The programme is expected to deliver four core results: (i) the implementation of the Tripartite Vehicle Load Management Strategy; (ii) an operational Tripartite transport register and information platform; (iii) the implementation of Harmonised Tripartite vehicle regulations and standards; and (iv) improved efficiency of regional transport corridors.

Overview of the investment in infrastructural projects in East Africa

Table 1 provides an overview of investment in infrastructure in the whole East African region.[20] This region has a total of 182 projects at a combined value of USD 146.5 billion. As Table 1 shows, transport represents 38 percent of all projects in the region.

The total number of projects in East Africa has risen by a substantial 156 percent between 2017 and 2019, with an equally substantial increase of 350 percent in the total US dollar value of projects. Kenya has the largest number of projects in East Africa, with 41 projects at a value of USD 38.2 million, followed by Ethiopia with 38 projects at a value of USD 19.1 million, while Tanzania has one of the largest port development projects in the country.[21]

Table 1. Investment Projects in East Africa

East Africa	2014	2015	2016	2017	2018	2019
Number of projects	*51*	*61*	*43*	*71*	*139*	*182*
Value (USD billion)	*60.7*	*57.5*	*27.4*	*32.6*	*87.1*	*146.5*
Share of Transport project (by number)	*59%*	*51%*	*47%*	*52%*	*45%*	*38%*
Share of Energy project (by number)	*37%*	*30%*	*26%*	*23%*	*18%*	*22%*

Source: Deloitte 2019

The transport sector continues to receive the most investments in East Africa, accounting for 38 percent of all projects in the region, and 30 percent in terms of the project value. Energy and power projects account for a significantly lower share of projects, at 22 percent and 27 percent respectively. The focus on these two sectors reflects the fact that a well-developed transport network, as well as reliable energy supply and access, are integral to the East African Community's (EAC) Development Strategy.

A number of developing partners are supporting infrastructure development in Africa. China, EAC governments, and international donor funding institutions (DFIs) are among the largest funding agencies (see Table 2). In terms of project ownership, EAC governments have a majority share (79.1 percent), indicating the important role played by East African governments as facilitators of infrastructure development through national and regional development policy plans.

Table 2. Investment projects in East Africa, by the funding entity

Funding Country/Institution	Percentage
China	*20.9%*
EAC Governments	*13.7%*
International DFIs	*13.2%*
African DFIs	*12.6%*
Single Countries	*7.7%*
Consortiums	*7.1%*
Private Domestic	*6.6%*
EU Countries	*6.0%*

[20] Including Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Seychelles, Somalia, Tanzania, and Uganda.
[21] Deloitte (2019). Africa Construction Trends Report 2019. Available at https://www2.deloitte.com/za/en/pages/energy-and-resources/articles/africa-construction-trends.html

Funding Country/Institution	Percentage
Middle East Countries	4.9%
African Countries	4.4%
Other Asian Countries	2.7%

Notes: Single Countries include Australia, Canada, Norway, Switzerland, UK, and the US. Middle East Countries include Oman, Saudi Arabia, Turkey, and the UAE. EU Countries include Austria, Finland, France, Germany, Italy, Luxembourg, and Portugal. African Countries include Angola, Ethiopia, Mauritius, Morocco, Nigeria, South Africa, and Tanzania. Other Asian Countries include India, Japan, and South Korea. Source: Deloitte 2019

4. Value Chain Selection

The selection of value chains for the focused countries is based on a combination of several available or constructed indexes. The chosen indexes are a balance between demand and supply. They include the current and forecasted demand, supply, imports, exports, price volatility, etc. The objective is to cater for food security and the promotion of intra-regional trade, as well as to consider essential aspects such as resistance to climate change and change in consumption patterns.

The rationale behind this methodology is threefold:

- **Capture production**: production-related indicators identify the products that are cultivated by countries to prioritize those with (1) high production values and (2) high growth rates.
- **Capture trade:** export-related indicators highlight the potential that the commodities have in the international market, prioritizing those with high demand abroad. Import-related indicators showcase the internal demand for food products, which indicates a potential opportunity for increased production. Similarly, the revealed comparative advantage indicator targets those value chains that have a distinct advantage over international competition.
- **Capture volatility:** the volatility indicator is instrumental in revealing the price-stable commodities.

The different indicators are presented below:

1. Production Value Index

The current *value* of *production* measures value in the prices relating to the period being measured. Thus, it represents the market *value* of food and agricultural products at the time they were *produced*. The data set includes data on production values (gross and net). Our score for the commodity was the percentage of the production over the total production value of all products for the country.

2. Production Growth Index

The production growth index measures change in projected value production from 2015 to 2025 (IFPRI), taking into account increased population and income growth, increases in productivity, and some amount of climate change that affects crop production according to whether it is irrigated or not. The scores are attributed to the overall change in production between the two aforementioned years.

3. Exports Value Index

The latest export values for the different value chains were analyzed. International reliable sources, such as UN Comtrade or ITC Trademap, provided data for the year 2018 for most countries. Otherwise, data for 2016 or 2017 was available and used. The score attributed to the commodity was a ratio of the value of exports for the product sector over the total value of exports.

4. Demand Growth

The demand growth index is the absolute change in the value of the total demand for the commodity from 2015 to 2025 (IFPRI). Forecasted data on the increase in demand measured in tonnes and value is available from IFPRI. For this index, the value was considered.

5. Imports Growth

The index identifies the projected absolute change in imports in the region in which each country is located. The data is from IFPRI.

6. Imports Value Index

The same approach as to the export value index is used for the Imports value index. Conversely, the index looks at imports just like exports apply for the Exports Value index.

7. Volatility Index

The volatility of the price data was taken into consideration in the selection criteria. A coefficient of variation was derived from FAO's monthly producer price data. From the coefficient, a measure of volatility was derived. The least volatile products are given the highest scores.

8. Revealed Comparative Advantage

This index helps to identify value chains, where the targeted country has an obvious advantage in international competition. This is of special importance in promoting the trade of commodities that are more likely to be competitive.

The results from applying the methodology are highlighted below:

Production Value %

Commodity	Production Value
Cassava	20.50
Bananas/Plantains	18.52
Maize	13.15
Sweet Potato	9.52
Beef	8.73
Dairy	8.10
Meat indigenous, cattle	5.63
Sorghum	5.29
Beans	4.81
Vegetables	3.96

Production Growth

Commodity	Production Growth
Bananas/Plantains	6,660
Beef	4,279
Vegetables	4,202
Sweet Potato	2,313
Other Roots	2,122
Fruits	1,736
Dairy	1,456
Beans	1,250
Cassava	828
Potato	305

Exports %

Commodity	Exports
Coffee	25
Tea	23
Total Other Oilseeds	13
Tobacco	11
Vegetables	10
Wheat	7
Other Pulses	5
Maize	5
Beans	5
Palm Oil	4
Sugar	3

Imports %

Commodity	Imports
Palm Oil	29
Wheat	18
Sugar	15
Rice	14
Maize	6
Sunflower Oil	4
Poultry	3
Sorghum	3
Nuts	3
Beans	3
Other Pulses	3

Demand Growth

Commodity	Demand Growth
Bananas/Plantains	7,121,587
Vegetables	3,719,379
Beef	3,008,395
Sweet Potato	2,415,910
Beans	2,284,388
Other Roots	1,730,692
Fruits	1,205,669
Dairy	604,904
Lamb	454,548
Potato	349,060

Import Growth

Commodity	Imports Growth
Wheat	14,133
Maize	11,626
Beef	9,345
Bananas/Plantains	8,918
Beans	8,600
Vegetables	7,981
Palm Oil	5,900
Potato	4,784
Other Pulses	4,088
Fruits	1,258

Volatility

Commodity	Volatility
Tea	0
Palm Oil	2
Millet	3
Maize	5
Bananas/Plantains	6
Nuts	8
Sugar	9
Rice	9
Sorghum	11
Sweet Potato	14
Dairy	21

The overall 5 top Value Chain selection approach

For each country and region, the top five value chains with the highest scores were selected for our analysis. There were a series of considerations in the selection.

Re-alignment of commodity coding structure

Since data from different sources was used, mainly from the UN Comtrade, ITC TradeMap, IFPRI, and FAO, there was the necessity to use a common commodity identifier. With IFRPI having already developed a mapping table to FAO, all codes were re-aligned and mapped to a common FAO description.

Scoring and Ranking

The scores of the indexes varied in scale because some of them were absolute changes while others were ratios or percentages. In this methodology, the top ten commodities in each index were given a score ranging from 1 to 10. For simplicity of analysis, an unweighted aggregation of the rank of the commodities in each index was used as a selection criterion for the top value chains.

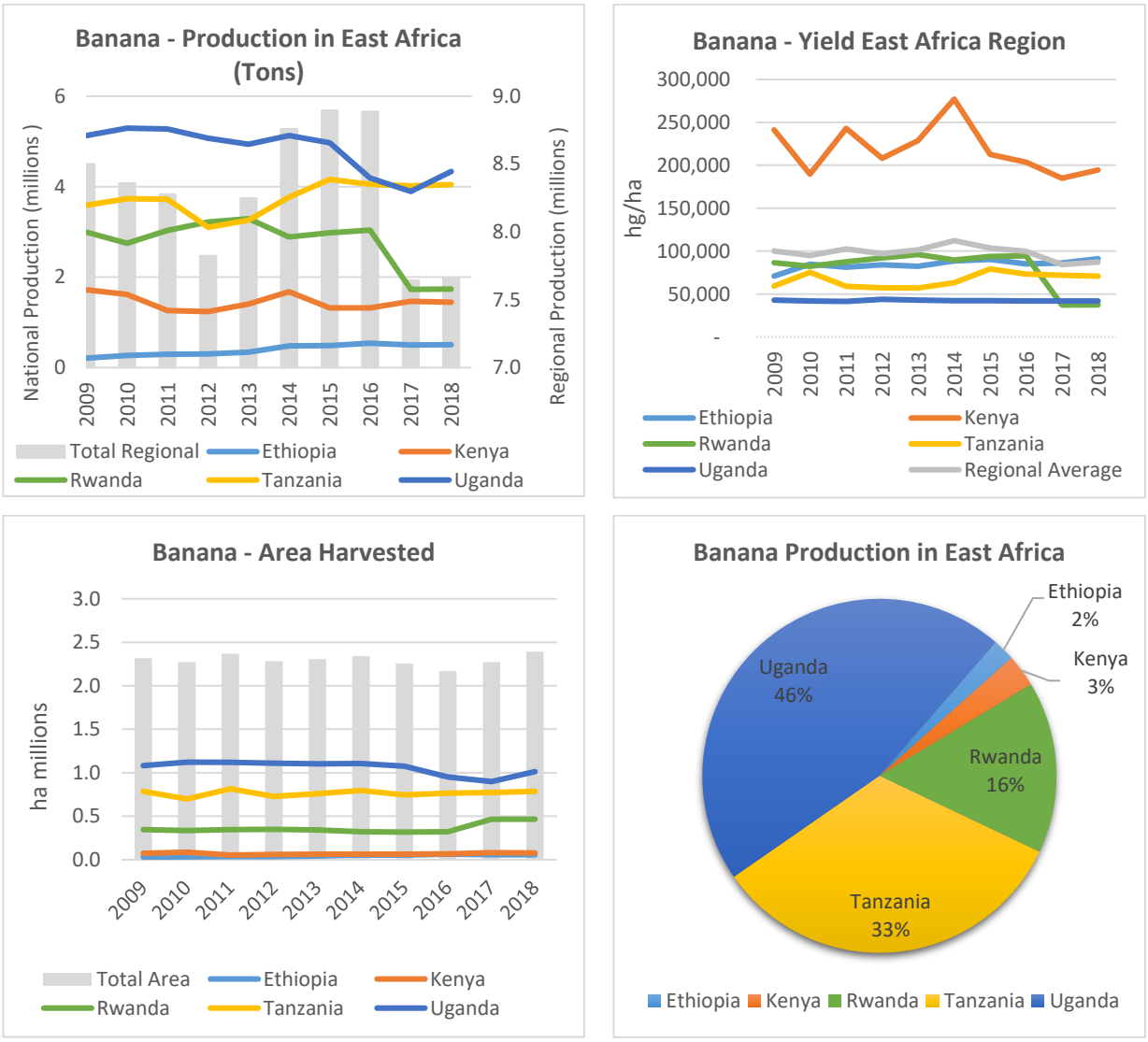
Overall, the methodology leads to the conclusion that East Africa should focus on bananas, beans, beef, maize and vegetables as the products for increased intra-regional trade and food security.

5. Banana Value Chain

Key consumption, production and trade trends

Bananas are a key staple crop and have an important role in household food security in East Africa.[22] Bananas play a central role in addressing food security, feeding over 35 million people, and being a reliable source of income for smallholder farmers in the region.[23] This crop is also one of East Africa's economic backbone, where over half of all cultivated land is planted with bananas. As indicated in Figure 5, Uganda is the largest banana producer in the East Africa region, with 46 percent of the market share, followed by Tanzania (33 percent) and Rwanda (16 percent)[24].

Figure 5. Banana Production statistics in East Africa



Source: FAOSTAT

[22] In this report, bananas collectively refer to plantains and dessert bananas.
[23] Kilimo-Trust (2012). Banana Value Chain(s) in the East Africa Countries: consumption, productivity and challenges. Kampala, Uganda: Kilimo Trust.
[24] For a list of resources in Africa on market information systems, please refer to Annex 4.

Bananas are mainly planted for the farmers' consumption, resulting in weaker commercialization. Bananas are grown by 80 percent of smallholders and 90 percent of the population consumes green bananas as a staple food. Bananas and plantains provide food and income for more than 50 million smallholder farmers in the region.[25]

The consumption of bananas in the East African region is the highest in the world. This crop provides 3–22 percent of the total daily calorie consumption at an estimated 147 kcal per person.[26] In Uganda, for example, 70 percent of all bananas are consumed as "*matoke mash*" by the farmers and their families, and 20 percent of the production is destined for local sales and exports. In Tanzania, 60 percent of the total production is consumed by the farmers, with only 8 percent of the production being destined for sale.[27] The average annual consumption per capita in Rwanda, Tanzania, and Uganda is estimated to be more than 100 kgs.[28]

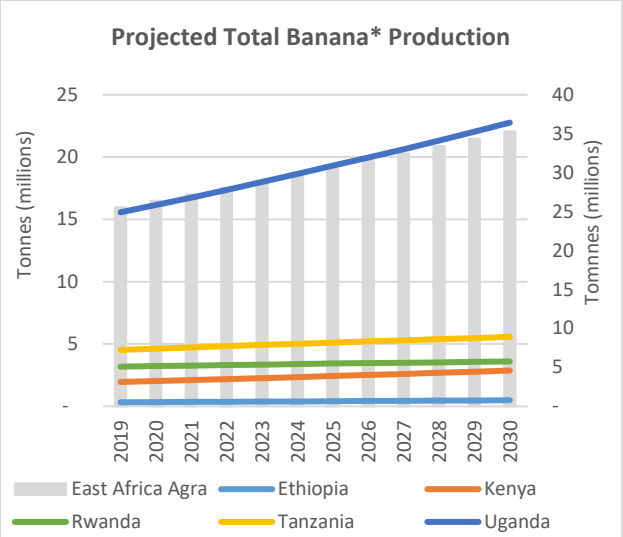
East Africa's banana production has declined over the past few years. FAO statistics indicate that the total banana production (plantain and dessert bananas) in the region has experienced some fluctuations, with an overall decline of nearly 10 percent during the 2009-2018 period. Banana production in the region dropped from 8.5 million tonnes in 2009 to 7.8 million tonnes in 2012, increased to 8.9 million tonnes in 2015, followed by a significant decrease running into 2018. The most acute reduction has been experienced in Rwanda and Uganda (the largest producer), where production has dropped by 41.6 percent and 16.0 percent respectively.

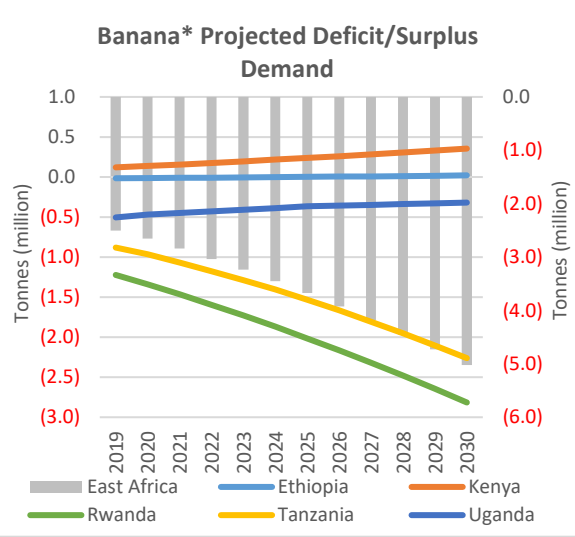
The decrease in production has occurred despite an increase in the banana cultivation area, which moved from 2.26 million ha to 2.29 million ha during the 2015-2018 period. This situation is mainly due to a decrease in productivity. Between 2015 and 2018, productivity decreased from 6.2 tons per ha to 5.0 tons per ha. The region's banana yield is significantly low in comparison with the yield of 34.9 tons per ha enjoyed by India, the world's largest producer. This low productivity is a result of diseases, especially banana wilt, climate change, poor soil fertility, use of poor varieties of bananas and poor management practices.

The projected production figures from IFPRI indicate that the total production of bananas will grow at an annual average of 3% from 2019 to 2030. The demand for bananas is expected to grow by 3.4% annually, resulting in a deficit in the total supply of the crop between 2019 and 2030. The largest demand for bananas will be in Tanzania and Uganda, resulting in the highest gap.

[25] Tinzaara, W.; Ocimati, W.; Kikulw, E; Otieno, G.; Stoian, D.; Blomme, G. (2018). Challenges and opportunities for smallholders in banana value chains. Oct 2018
[26] Tinzaara et al. (2018), ibid
[27] Selina Wamucii (undated). Four Countries, Four East African Banana Agendas. Available from: https://www.selinawamucii.com/four-countries-four-east-african-banana-agendas/
[28] Joachim, D.; Matemu, A.; Ndakidemi, p. (2018). Potential of cooking bananas in addressing food security in East Africa. International Journal of Biosciences, Vol. 13, No. 4, p. 278-294.

Figure 6. Project Total Banana (Dessert banana and Plantain) Production and demand in East Africa

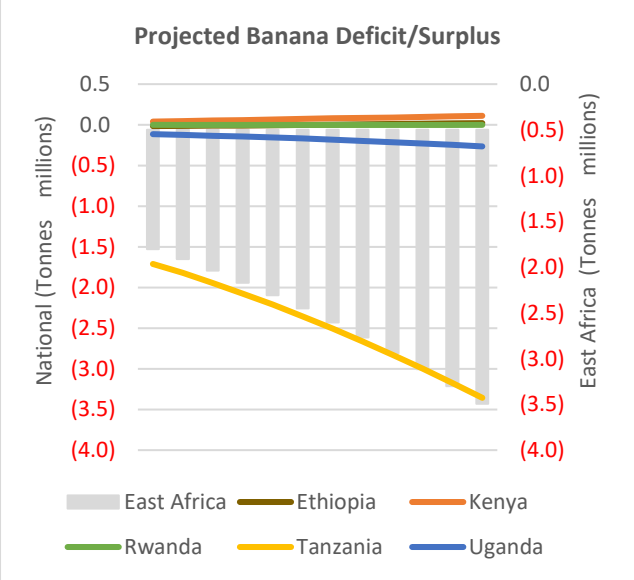


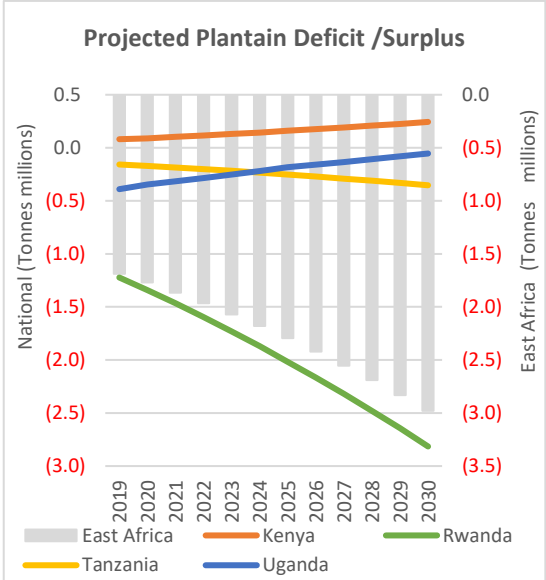


(Total Banana: Banana + Plantain). Source: IFPRI

Projected data from IFPRI indicates that Kenya will be the only country with a surplus in both dessert bananas and plantains Regarding dessert bananas, Tanzania will be in the highest deficit position with a significant increase in demand. Most countries will have their demand match their production levels, leading to a lower deficit. In the case of plantain, apart from Kenya, East African countries are expected to run small deficits between 2019 and 2030. The data shows that while the situation is expected to improve for Uganda approaching 2030, in Tanzania, the deficit level is expected to widen. Rwanda is projected to have the highest deficits in plantain, reaching more than 2.8 million tons in 2030.

Figure 7. Projected Dessert banana and Plantain Production and demand in East Africa





Source: IFPRI

Bananas are cultivated widely across East Africa. In Ethiopia, bananas are mainly produced in the southwestern part of the country in the Southern Nations, Nationalities and Peoples Regional State (SNNP), and the Oromiya Regional States. The specific major banana production area in the country is Arba Minch, with about 2,500 hectares dedicated to the cultivation of bananas. The second major production area is in the southwestern part of the country, around the zones of Jimma, Sheka,

Kaffa, and Bench Maji in the Southern and Oromiya regional states.[29] In Kenya, bananas are widely grown in the western part, in areas surrounding Lake Victoria, on the slopes of Mt. Kenya, and along the coast. In Tanzania, apart from the Kagera region, the highland bananas are grown in Kigoma, Mbeya, Kilimanjaro, Arusha, Tanga, Tarime district in Mara region, and some parts of the Morogoro region (Mgenzi Byabachwezi, Mkulila). In Uganda, the crop is grown in all regions that do not experience a pronounced dry season, i.e. areas within about 80 kilometers of the shore of Lake Victoria, the southwestern highlands, the slopes of Mt. Elgon in the East, and the well-watered areas of the western part of the country. More than 20 percent of the area of Rwanda is occupied by bananas, of which more than 65 percent represent the East African Highland bananas.[30] The areas around the Great Lakes are among the highest banana consumption areas in the world, and where banana crop acreage reaches 20-30 percent of the area under cultivation.[31]

Despite the existing potential, East African bananas are barely exported. Even with the increasing international demand, bananas from East Africa remain a local commodity. In 2018, the region's recorded exports of bananas amounted to USD 3.4 million. Imports were concentrated mainly around Kenya and Rwanda, which imported bananas from Uganda. The largest exporters were Ethiopia (USD 2.4 million in 2018 to Somalia and Djibouti) and Uganda to markets such as Sudan and Kenya. This situation can be partially explained by quality-related concerns, especially regarding the quality during transportation. Also, key importers of bananas banned Kenya's exports due to the presence of an invasive Asian fruit fly known as *Bactrocera invadens*.[32] The bans have since been lifted, but the problem remains, especially as the climate warms.[33]

Intraregional trade statistics indicate that there is a very low level of trade between the East African countries (see Table 3). The only two main importers of bananas are Rwanda (USD 101,000 in 2018) and Kenya (USD 217,000 in 2018). Both these countries are being supplied by Uganda.

Table 3 Main East African Export for Bananas

Countries	Main Export Markets and percent year Average annual (5 years) export value
Ethiopia	Somalia (USD 1.5 million), Djibouti (USD 0.8 million)
Tanzania	Malawi (USD 0.45 million)
Uganda	Kenya (USD 130,000), Rwanda (USD 74,000)

Source: ITC Trademap

Key regional competitiveness drivers and challenges

The potential for bananas to increase food security and improve livelihoods in the East African region is significant. However, in order to reap these benefits, increasing production is only one step in the process. Without complementary steps supporting crop handling, transport, processing, and marketing, attempts to increase on-farm production will have limited impact.[34]

Diseases and inefficient coordination within the value chain are the two factors affecting the competitiveness of banana production in the region. The production and supply of East African bananas are affected by diseases like bacterial wilt, sigatoka, and nematodes. Also, the lack of

[29] Zinabu Ambisa, Bikila Tesfa, Temsgen Olani and Diriba Abdeta (2019). Review on the Production and Marketing of Banana in Ethiopia, World Journal of Agriculture and Soil Science, April 2019.
[30] Karamura D.A., Karamura E.B. and Tinzaara W. (editors) (2012). Banana cultivar names, synonyms and their usage in Eastern Africa, Bioversity International, Uganda
[31] Karamura D.A., Karamura E.B. and Tinzaara W. (2012), ibid
[32] See http://farmbizafrica.com/profit-boosters/1622-kenya-reclaims-banana-export-markets-after-ban-lift
[33] See Wambui, C. (2020). Kenyan farmers battle fruit-fly menace as climate warms. Thompson Reuters Foundation, April 12. Available from: https://news.trust.org/item/20200412062036-50naz/
[34] Kilimo Trust (2015). Building Blocks of Trade in Food: Kilimo Trust Biennial Report - July 2012 – June 2014

coordination amongst small farmers, due to the lack of cooperatives, weakens their position in the value chain. Poor accessibility to market information limits farmer power to capture a reasonable share of the price paid by consumers. Moreover, low farm gate prices make it challenging for farmers to purchase the required inputs for higher-level farm productivity.[35]

Multiple factors lead to the low commercialization of bananas produced in the region. Cross-border trade in bananas is minimal and largely remains informal. This is mainly due to the bulky nature of fresh bananas and their high perishability making transportation over long distances expensive in addition to the fast rate of deterioration in quality.[36] As a result, these two factors translate into narrow margins that make it unattractive for investors to trade fresh bananas across borders. Exports to international markets are insignificant (see Table 3), which also indicates the potential of increasing current export levels. Cold chains have helped to improve storage (see Box 2). However, production and post-harvest practices still need to be improved to enhance the commerciality of bananas.

Box 2. Cold chains to improve fruit and vegetable production

Food refrigeration and cold storage equipment are finding their way into the rural areas of the world that need them the most. From India to Africa, new partnerships, solar technologies, and government efforts are improving people's lives by keeping fruits and vegetables from rotting through refrigeration. Rural farmers are using these emerging cold chains - temperature-controlled supply chains - to grow high-value produce and access lucrative markets. Managed access to refrigeration and cold chains can increase the competitiveness of rural subsistence farmers, turning them into agri-businesses.

Similar partnerships are emerging in East Africa. One such effort has 10,000 rural farmers in Kenya selling their fresh produce to Twiga Foods, which distributes bananas to thousands of street vendors, who then sell them in the capital, Nairobi. Before being sold, bananas and other crops are cooled and ripened by super-efficient cold storage units at Twiga Food's warehouse in Nairobi. The units, developed by InspiraFarms, use 70 percent less energy than traditional refrigeration systems and have up to two days of thermal backup capacity if there's a power outage.

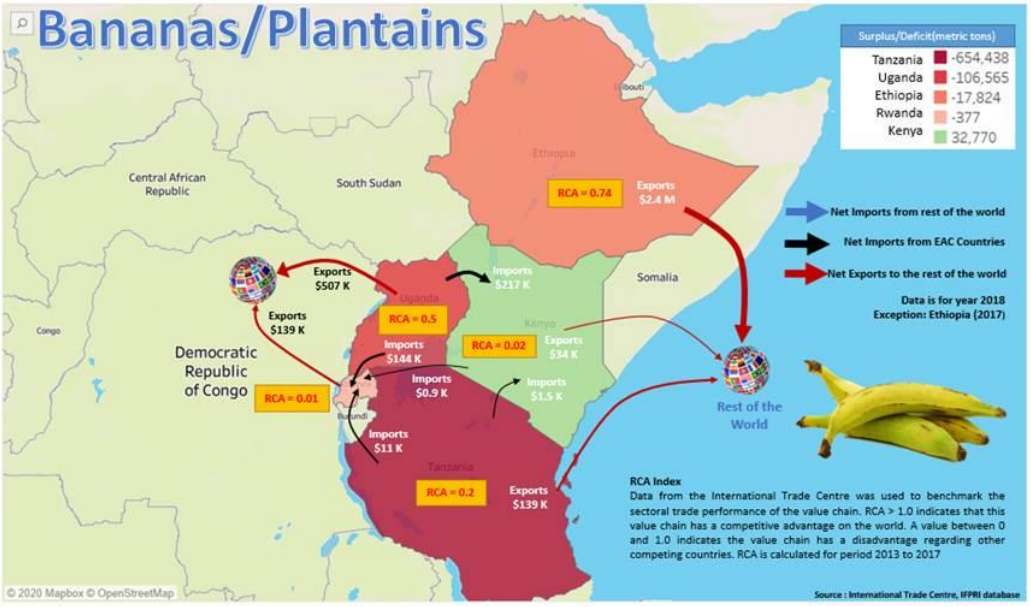
InspiraFarms' technology has also captured the attention of the Rwandan government, which, like India, recently adopted a National Cooling Strategy. In 2018, with the World Bank's support, it installed 10 of InspiraFarms' solar-powered cooling units in six rural areas that have no electricity or refrigeration. The units are expected to benefit as many as 100,000 smallholder rural farmers.

Source: Fleming, P. (2019). How food cold chains are improving lives and livelihoods in Asia and Africa.[37]

Overall, the region is not competitive in the production of bananas. This is evidenced by a low Revealed Comparative Advantage (RCA). Ethiopia, the most competitive country in the region, has an RCA of 0.74. Other countries, such as Tanzania and Uganda, have a significant deficit in production. If the aforementioned competitiveness constraints to commercialization are addressed, such countries could benefit from regional trade to solve the production deficit issues. For example, countries facing deficits can source their bananas from Kenya, the country that shows the biggest production surplus.

Figure 8 Analysis of the competitiveness of EAC bananas and movement across countries

[35] Famine Early Warning Systems Network (FEWS NET) (2018). Tanzania Market Fundamentals Summary.
[36] Ibid
[37] Fleming, P. (2019). How food cold chains are improving lives and livelihoods in Asia and Africa. Greenbiz, 11 April 2019. Available at: https://www.greenbiz.com/article/how-food-cold-chains-are-improving-lives-and-livelihoods-asia-and-africa



Source: Analysis by International Economics Consulting Ltd.

Value Chain Stakeholder Analysis

The banana value chain in East Africa has a simple and fragmented pattern. It consists of farmers, wholesalers, middlemen or brokers, and traders, all linked by the central wholesale markets in big cities**.** The production is dominated by smallholders. The majority of bananas are destined for the domestic market and are sold through a fragmented system of informal relationships between the various actors, and based on trust. In some cases, one actor may play multiple roles (e.g. farmer, wholesaler, and retailer). There may be slight variations from country to country and between the actors, but the structures have a lot of commonalities. Table 4 provides a summary of the banana value chain actors by country.

Table 4. Value chain actors in the Banana value chain in East Africa

Ethiopia[38]

Actors	Description
Producers	*Small-scale farmers and large-scale commercial growers are the major producers of bananas in Ethiopia. Bananas are sold to either local licensed farm-gate collectors or farmer cooperatives/unions.*
Farmer Cooperatives/ Unions	*Consist of groups of village-level farmers formally organized into farmer cooperatives or unions to market their bananas, and access or purchase inputs. At times they enter directly into agreements with input suppliers, service providers, donors, and export outlets*
Farm-gate collectors	*Village-based licensed middlemen or intermediaries, who purchase the newly harvested bananas at the farm gate from the direct producers, and forward it to wholesalers in the major regional and central markets.*
Wholesalers	*Operate mostly at major regional and central market outlets; buy bananas in bulk either directly from producers or through the licensed farm gate collectors, and ripen and sell*

[38] Zenebe Woldua, Ali Mohammedb , Derbew Belewc , Zekarias Shumetad , Adam Bekelee (2015). Assessment of Banana Production and Marketing in Ethiopia, International Journal of Sciences: Basic and Applied Research (IJSBAR), Volume 24, No 3, pp 283-307

Actors	Description
	them to individuals and institutional retailing business operators (greengrocers, supermarkets, street, and open market vendors, etc.)
Retailers	*These are traders that purchase either green-ripe or yellow-ripe bananas from wholesalers and sell them to consumers.*
Export Buyers	*Consist of foreign traders often in the neighboring countries of Djibouti and Somaliland, who purchase fresh bananas from Ethiopia.*
State farm	*Following the privatization process in the 1990s, there is now only one state farm producing bananas on 285ha with plans to expand to 400ha.*

Kenya[39]

Actors	Description
Producers	*Small scale farmers are dominant producers of banana in the country*
Farmer Cooperatives/ Unions	*Direct linkages with traders or brokers by individual farmers harvesting small quantities and delivering directly to the bulking centres.*
Brokers	*Operate at farm end due to the lack of cooperation among farmers to aggregate their produce at a single point where wholesalers can purchase. Brokers move around individual farms to collect harvested bananas.* *For plantains, there are two levels of brokers: (i) brokers who go round farms to collect bananas until the required quantities are met, and (ii) master brokers, who have contacts with wholesalers at bulking centres or markets in urban centres, and involved in moving products from one point in the supply chain to the other.*
Wholesalers	*Buy from brokers and farmers. Some wholesalers work directly with farmer groups, arrange for transport to go round farms to collect bananas that have been bulked besides the rural roads.*
Retailers	*Consist of supermarkets, kiosk owners, hawkers, and greengrocers, who buy bananas at various stages of ripening from the wholesalers.*

Rwanda[40]

Actors	Description
Small and Medium Farmers	*Produce bananas, among other subsistence crops, mainly for household consumption. Limited use of good agriculture practices (GAP) and low use of intensification methods.*
Producer Cooperatives / Associations	*Consist mainly of farmers and are able to generate large volumes. Some may be large enough to own their trucks and have strong linkages with other market players.*
Large Farmers	*Often mono-crop producers and employ improved production methods. Characterized by bigger plot size, extensive use of inputs and GAP, higher yield leading to more attractive marketing channels, better position in the value chain, and higher and more consistent returns.*

[39] FAO (2014). Food Loss Assessments: Causes and Solutions Case Studies in Small-scale Agriculture and Fisheries Subsectors, Kenya. Banana, Maize, Milk, Fish, 2014.
[40] USAID (2018). Postharvest loss assessment of Green Bananas in Rwanda. USAID.

Actors	Description
Middlemen	*Production middlemen informally act as conduits between smaller farmers and wholesalers during price negotiation, facilitating the transactions, and enforcing informal contracts.* *Distribution middlemen connect wholesalers to retailers at various markets and central and secondary levels. Their relationships are informal and based on trust rather than contracts.*
Wholesalers	*Consist of either cooperatives or individuals, and typically focus on one region and specialize only in bananas. Around 30 percent of traders are backward integrated, which means they own farms and have supply sources and trucks for collection. They also have the ability and contacts in neighboring countries to bring in the product when their supply is low.*
Market Traders and Retailers	*Purchase and sell banana bunches by the kilo. They have dedicated spaces at major wholesale markets and have repeat customers (individuals, traders, or institutions).*

Tanzania[41]

Actors	Description
Producers	*Producers are the farmers and the ones responsible for banana cultivation. They are the main actors in the value chain.*
Brokers	*Brokers collect bananas directly from the farmers. Brokers are commission agents linking farmers with lorry traders, who buy directly from them. Brokers also engage in the transportation of bananas to urban markets.*
Wholesaler/Lorry Traders	*Lorry traders mainly buy bananas from brokers, with whom they have long and well-established relationships. Traders tend to work with brokers because they prefer to buy bulked stocks that have already been quality screened by the brokers. Price-related information is shared between the lorry traders and the suppliers.*
Retailers	*The vendors procure their entire banana stock from the lorry traders, then sell produce to household consumers, hotels, restaurants, and schools.* *Supermarkets are also involved in the retailing of bananas, and they prefer varieties with longer shelf lives, and large finger sizes. The greatest challenge faced by supermarkets is the inconsistent supply of bananas.*
Exporters	*Exporters procure bananas from farmers directly (mostly) or from brokers (partly).*

Uganda

Actors	Description
Smallholders	*Produce and sell banana bunches to bicycle traders at farm gate prices based on the finger and bunch size, banana types, and variety.*
Bicycle Traders	*Sell their bananas to brokers/lorry traders at collection centres located within the producing areas.*

[41] CGIAR (2015). Technical report: Structure of the Cooking Banana Value Chain in Uganda and Opportunities for Value Addition and Postharvest Losses Reduction. Expanding Utilization of Roots, Tubers and Bananas and Reducing Their Postharvest Losses. Available at https://www.rtb.cgiar.org/wp-content/uploads/2015/08/RPS/2/3.pdf

Actors	Description
Brokers	*Operating at collection centres, purchase large amounts of bananas to fill up trucks destined for urban centres such as Kampala, and sell the bananas to wholesalers in various areas in the city*
Wholesalers	*The city-based wholesalers purchase bananas from brokers and sell them in bunches to urban retailers or sometimes directly to consumers.*
Exporters	*Buy from wholesalers or brokers and export to the relevant markets*

A list of stakeholders and contact details is presented in Annex 3.

Key Findings on Value Chain

With average yields often not exceeding 30 percent of the crop's potential, banana productivity is generally low in the EAC region.[42] According to FAO, the yield for both [dessert] bananas and plantain has been decreasing by an annual average of 4.2 percent and 1 percent, respectively, during the last five years. Over the same period, the yield in East Africa has been 4.6 times lower than that of India, the largest producer of bananas in the world. Banana production, as a whole, and yields are constrained by lack of production efficiency, which is exacerbated by pests and diseases, soil degradation, limited application of sound farming practices, lack of fertilizers and other inputs, the short shelf life of the fruit, limited availability of labor, postharvest losses, and poor market access.

These challenges need to be addressed by key stakeholders in the value chain, comprising smallholder farmers, buyers, processors, and traders, in collaboration with service providers such as government agencies, non-governmental organizations (NGOs), and private businesses providing technical, business, and financial services. The following table provides a summary of the challenges faced in the banana value chain in the Eastern Africa region.

[42] Tinzaara et al. (2018), ibid

Table 5. Regional challenges in banana value chain in East Africa

Stages in VC	Challenges
Pre-production	• Limited availability of labor for land preparation • Limited use of and access to quality planting materials/ seeds • Social constraints • Land tenure and fragmentation
Production	• Limited availability of labor for plantation management • Poor access to fertilizers and pesticides • Poor soil fertility and water/moisture stress • Poor crop management practices • Pests (weevils, nematodes) • Bacterial, fungal, and viral diseases • Climate variability and change
Post-Harvest	• Post-harvest losses • Low added value
Marketing	• Asymmetric market information • Low prices for produce/seasonal fluctuation of prices • The high tax burden, especially for transport agents • Poor road networks increasing transport costs • Unequal benefit sharing among value chain actors • Low quality of the products, compromising prices

Source: Tinzaara et al. (2018)

Regional Policy

The EAC has been working towards developing the East African industrialization policy and related strategies to create an integrated framework for industrialization through agro-processing and increased trade in value-added products among the EAC countries. It is expected that this will lead to the growth of cottage industries and stimulate agro-processing and value addition for major crops in East Africa.

Farmers and processors see the value of "connecting farmers to markets" (e.g. to access better technologies, seeds, and fertilizers to enable year-round production). However, in reality, regional integration still suffers heavily from the lack of follow-up on policy reforms by governments. Products rejected at the border for failing to meet standards are among the biggest Non-Tariff Barriers (NTB) to trade in the Eastern Africa Community, even if it is a customs union. NTB-reduction is very high on the official agenda.[43] These issues need to be addressed at both the national and regional levels.

[43] EPCDM (2013). Bananas and Bottlenecks: Piloting Regional Value Chain Cooperation for Food Security, *18-10-2013*

Recommendations

Recommendations for intervention specific to the banana value chain in East Africa are presented in the table below.

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Implement R&D programmes to develop new improved varieties that are climate-smart, pest and disease-resistant; diversified banana products and by-products	Improved quantity and quality of production; Higher value-added for the banana production sector and better-integrated value chain	Producers; Processors	Medium	High	Low	Long	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF
Establish input and extension services clusters/centers to support banana growers in adopting better business and farming practices. Conduct awareness-raising programmes to increase knowledge on the same.	Improved quantity and quality of production	Producers	Medium	High	Low	Short	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF
Raising awareness and training on the adoption of Good Agricultural Practices (GAP) and Good Handling Practices (GHP) in the production and processing of banana products	Improved quality of products to match market requirements and potential exports	Producers, Processors	High	High	Medium	Short	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF
Develop new (or promote the use of existing) market information systems to improve the information flows among value chain actors. Carry out market research to explore possible intra-regional value chain integration and new potential consumption markets	Increased access to market and product-related information for better planning of production; Higher value-added for banana production sector and better-integrated value chain	Producers, Exporters	High	Medium	Low/ Medium	Short	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF, Private Sector

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Improve the road network and other basic infrastructure. Provide incentives for the private sector to provide co-funding for infrastructural improvements that directly enhance value chain efficiency (e.g. facilities for transportation, storage, cold chain, etc.)	Reduced post-harvest loss and loss incurred along the value chain, thus reducing overall costs; Enhanced linkage from producers to end-consumers	Off-takers, Wholesalers, Retailers, Exporters	High	Medium	(Very) High	Long	Ministries/ Departments of Agriculture, World Bank, IFC, IFAD, TMEA, Afreximbank, Private Sector

**For Regional Food Trade; ** Investment level: Low (0-5 million); Medium (5-15 million); High (>15 million); ***Timeline (Short 0-2 years, Medium 3-5, Long 5+). Notes: BMGF = Bill & Melinda Gates Foundation.*

Source: Author's compilation

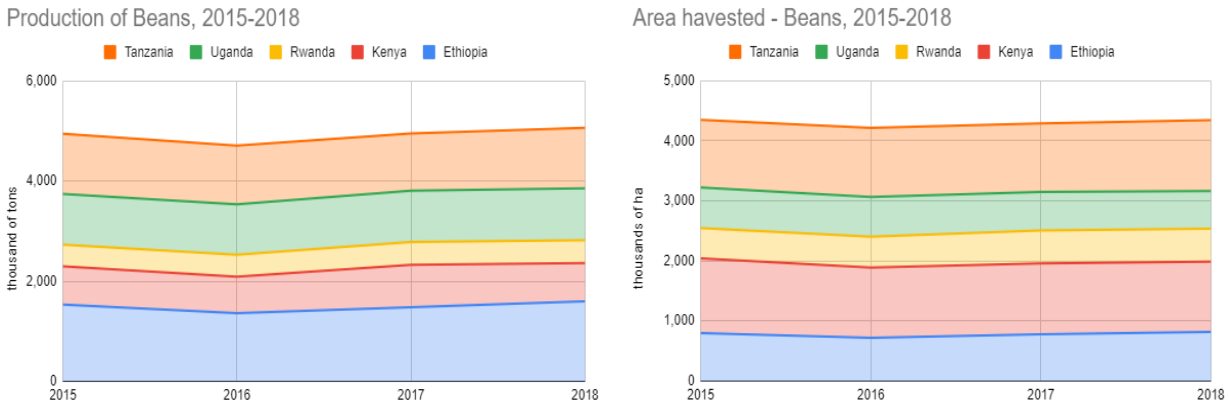
6. Beans Value Chain

Key consumption, production, and trade trends

Beans are the backbone of the diet of most East Africans. In Uganda, for example, beans are responsible for around 25 percent of the total calorie intake and 45 percent of the protein intake per capita. Meanwhile, Rwanda has the world's highest bean consumption, at 38 kg per capita per year.[44] As a result, beans in the region are primarily consumed on-farm: on-farm consumption ranges between 40-60 percent, with the balance going to local and urban markets, as a very small proportion for commercial processing or export.[45]

Their resistance to drought makes beans ideal for East Africa's climatic conditions of sporadic rainfall. The region's production has remained stable since 2013, with an average yearly production of 5 million tons. Kenyan farmers cultivated beans on nearly 1.1 million hectares (ha) of land and producing 755,000 tons of beans in 2013. In 2018, the country's production surface expanded by 8.8 percent, with 1.2 hectares of land being dedicated to beans, for a 17 percent increase in production to reach 855,000 tons. The main production zones in East Africa are given in Table 6.[46] Despite the progress made so far, the yield is still well below the world's average: in 2018, Kenya's average yield was 6.5 tons per ha, whilst the world's average was 8.6 tons per ha, highlighting a significant room for improvement.[47]

Figure 9. Production (left) and area harvested (right) of beans, 2015-2018



Source: FAOSTAT

Table 6. Dry beans production areas in East Africa

Country	Production Zones	Volumes produced (Metric Tonnes)	% of National production
Uganda (2018) [48]	*Central region (Lead Mubende District - 47%)*	*169,200*	*18*
	Eastern region (Lead Mbale District - 24%)	*78,960*	*8.4*
	Northern region (Lead Amuru District - 30%)	*253,800*	*27*
	Western region (Lead Ntungamo District -33%)	*413,600*	*44*

[44] Bizimana, J.; Bessler, D. A.; & Angerer, J. P. (2013). Impact of Market Information System (E-Soko) on Beans Markets Integration: Case of Rwanda.
[45] USAID (2016). Rwanda Early Generation Seed Study. USAID, and information obtained from field interviews.
[46] Information from fieldwork
[47] According to FAO Statistics.
[48] Uganda Bureau of Statistics (2020), 2019 Statistical Abstract.

Country	Production Zones	Volumes produced (Metric Tonnes)	% of National production
Rwanda (Districts) (2019) [49]	Gicumbi	21,115	8
	Kirehe	20,744	8
	Gatsibo	18,655	7
	Nyagatare	14,894	6
	Kayonza	13,144	5
	Ngoma	13,712	5
	Burera	12,804	5
	Ruhindo	11,955	5
	Rwamaga	10,972	4
	Others	114,574	45
Kenya (2018)[50]	Rift Valley Province	252,772	33
	Eastern Province	183,834	24
	Nyanza Province	137,876	18
	Western Province	91,917	12
	Central Province	91,917	12
Tanzania (2019) [51]	Western Zone	510,170	43
	Southern Highland Zone	318,418	27
	Northern Zone	209,121	17
	Lake Zone	90,515	8
	Eastern Zone	27,478	2
	Central Zone	20,005	2
Ethiopia (2017) [52,53]	Amhara region	140,118	40
	Oromia region	155,135	44
	Southern National Nationality Peoples' region	47,250	13
	Tigray regions	4,224	1
	Other regions	8,271	2

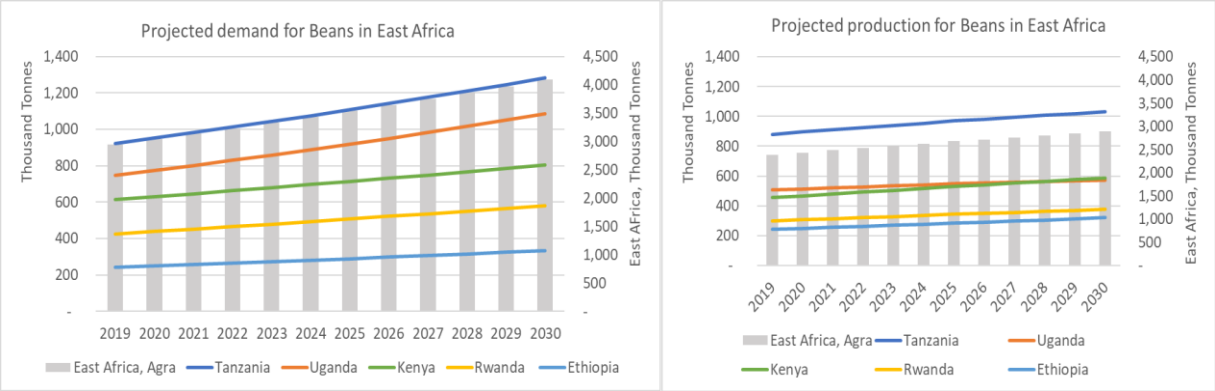
Source: IEC, Data from fieldwork

Projected demand is higher than production in East Africa, thus leading to a deficit in the supply of beans. According to IFPRI, East Africa bean production is expected to reach 2.8 million

[49] National Institute of Statistics of Rwanda (NISR) (2019). Rwanda Statistical YearBook 2019, December 2019
[50] ITC (2016). Pulses Sector Investment Profile Kenya
[51] According to Tanzania Pulse Network at http://www.tanzaniapulses.co.tz/ (Data source Ministry of Agriculture, Livestock and Fisheries)
[52] According to Central Statistics Agency of Ethiopia, at www.statsethiopia.gov.et/
[53] Kebede, E. (2020). Grain legumes production and productivity in Ethiopian smallholder agricultural system

tonnes, whereas demand is expected to rise to over 4 million tonnes by 2030. The deficit in bean production is projected to expand from 0.5 million tonnes in 2019 to 1.2 million in 2030.

Figure 10 Projected production and demand for Beans



Source: IFPRI

East Africa is an established exporter of beans, with exports reaching USD 440 million in 2019. Tanzania is the largest exporter of dry beans with exports reaching USD 170 million. Exports from the region grew at a CAGR of 9 percent between 2010 and 2019. The largest export destination for East African beans is India, where imports reached USD 159 million in 2019, followed by Indonesia with imports worth USD 24 million. Similarly, imports of beans are rapidly expanding, necessary to meet the region's internal demand. From 2010 to 2018, imports of beans have increased from USD 78 million to USD 148 million, a CAGR of 6.7 percent. However, in 2019, imports of beans in the region fell to USD 67 million, mainly due to the major fall in exports of Ugandan beans to other East African countries[54]. India, once a big exporter of beans to Kenya, has lost its market share to Uganda and Malawi, and now only accounts for 4.4 percent of Kenya's total imports. Uganda is also the main regional supplier, with over 30 suppliers[55] satisfying the regional demand – mainly from Kenya, Southern Sudan, Rwanda, and DRC.[56][57]

Key regional competitiveness drivers and challenges

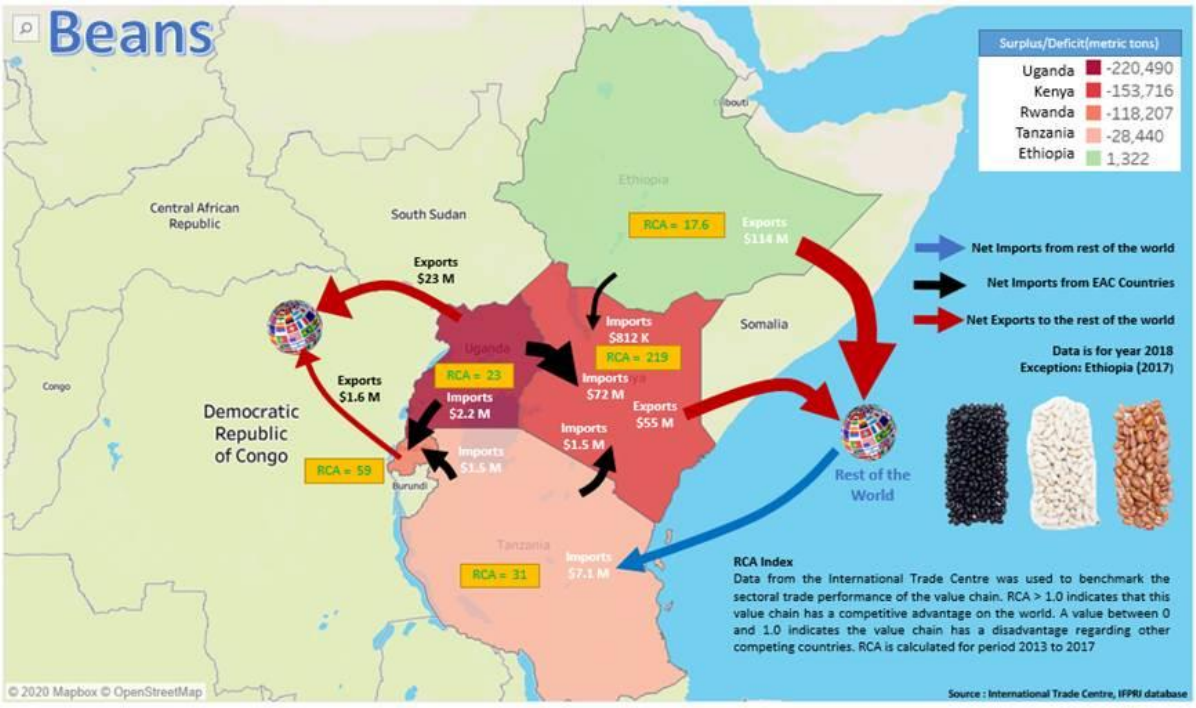
Not only are beans ideal for East Africa's arid climate, but this crop also contributes to the sustainable intensification of production systems in the region and can be cultivated all year round. As reported by local farmers, when maize, one of the most important staple crops, is planted after legumes like beans, they usually yield better. Legumes also reduce the amount of fertilizer used on maize if planted consecutively with maize. Beans allow intercropping with various other crops like maize, cassava, and groundnuts, and are widely planted in areas with limited farmland. Thus, beans provide for a self-sustaining system, given their properties of sustaining soil fertility and using fewer water resources.[58]

Overall, the region is extremely competitive in the production of beans. The countries' RCA ranges from 17.6 for Ethiopia to 219 for Kenya. Ethiopia is the only country with an expected surplus

[54] ITC (2020). ITC Trademap (database). Available at https://www.trademap.org/
[55] UNDP (2012). A Value Chain Analysis of the Dry Bean Sub-sector in Uganda. Development of Inclusive Markets in Agriculture and Trade (DIMAT) Project.
[56] The majority of the beans are traded through the road network. See UNDP (2012), *ibid*.
[57] For an overview of existing market information systems, see Annex 4.
[58] E. Birachi (2012). Value chain analysis of beans in eastern and southern Africa: Building partnerships for impact through research on sustainable intensification of farming systems. CIAT. November, 2012. Available at: https://core.ac.uk/download/pdf/132642347.pdf

in production, which is destined mainly for international exports. Kenya satisfies its internal demand for pulses from the region, mainly from Uganda, while exporting those of higher quality.

Figure 11 Analysis of the competitiveness of EAC beans and movement across countries



Source: Analysis by International Economics Consulting Ltd.

Challenges faced in the beans sector

Table 7. Challenges faced in the Beans sector

Areas	Challenges
Production	- Inadequate quantities for sustainable trade as production is largely subsistence and crop grown as a secondary and not main crop. - Limited skills and knowledge on improved farming technologies. - Varieties being grown are not tailored to market demand (mixed beans) while yellow beans have higher regional demand. - Fragmented farm units/poor quality/adulterated agro-chemicals/uncertain weather in rain-fed agriculture/depleted soils/expensive fertilizers and inputs. - Inadequate volumes of quality beans as farmers are not organized into efficient production and marketing entities for tradable volumes[59]. - The demand for improved seeds for legume crops (e.g. high-yielding or drought-resistant varieties) remains largely unmet, resulting in farmers paying high prices or not accessing improved seeds at all[60].
Processing	- Failed efforts by governments to process beans *(not sufficient volumes of the required variety being produced by farmers)*.

[59] KALRO (2020). Beans Upscaling, Kenya Agricultural and Livestock Research Organisation. Available at: https://www.kalro.org/csapp/index.php?option=com_content&view=article&id=29&Itemid=310
[60] FAO (2016) Promoting regional trade in pulses in the Horn of Africa

Areas	Challenges
	- Rudimentary ways of processing beans (threshing, sorting, and packaging all done manually - using hands and sticks) largely due to the high cost of machines. - Inconsistent power (numerous outages)/expensive cost of power/expensive credit (for working capital).
Marketing	- Poor storage facilities at aggregation points and production areas. - Poor product handling and quality issues. - The inadequacy of storage capacity combined with the vulnerability to damage while in storage makes traders unwilling to store beyond a minimum period of time. - Limited awareness among exporters and weak compliance to agricultural trade regulations such as SPS (thence informal trade predominance) - Inaccessibility of farms.
Transport	- The high cost of transportation is attributed to poor coordination between traders and truck owners not maximizing the capacity of trucks hired individually. - Inaccessible roads and poor infrastructure between producer regions and aggregation centres. - Unreliable rail transport (which should be the transport means of choice for bulky low-value goods like farm produce)
Policy Gaps	- Cost of production too high due to inputs (such as machinery, seeds, energy, etc.) being subjected to excessive taxation. - Limited re-investment in the sector. - Weak enforcement of Uganda Grain Trade Policy especially to prevent the export of raw grain. - Beans production should be profiled as a commercial crop in the policy. - Inadequate incentives for farmers to invest in bean production (more attention given to fresh legumes for international markets) - Not implementing the COMESA Simplified Trade Regime (STR).

Regional transportation and logistics routes

The main trade and transportation routes for beans in East Africa are given in Table 8.

Table 8. Trade corridors for Beans in East Africa

Country	*Starting Point*	*Corridor(s) / Roads Used*	*Destination*
Uganda	*Districts in Western Region (Isingiro, Ntungamo, Kabale)*	*Mbarara – Kampala – Jinja - Mbale*	*Kampala, Jinja, Mbale*
		Mbarara – Kampala - Busia	*Kenya*
		Kabale – Katuna border	*Rwanda, Burundi*
		Mbarara- Ishaka-Kasese-Mpondwe border	*DRC Markets - Kasindi, Beni, Butembo, Kasangani, Kinshasha)*
		Kyotera/Lyantonde – Masaka – Kampala	*Kampala, Jinja, Mbale*

Country	Starting Point	Corridor(s) / Roads Used	Destination
	Districts in Central Region (Masaka, Rakai, Mubende)	Kyotera/Lyantonde – Masaka – Kampala – Busia border	Kenya
		Mbarara-Ishaka- Mpondwe	DRC
		Fort Portal – Kasese -Mpondwe border	DRC
	Districts in Northern Region (Arua, Gulu, Amuru)	Kampala-Mityana-Mubende-Fort Portal –Kasese- Mpondwe border	DRC
		Gulu/Kitgum - Kampala	Kampala, Jinja, Mbale
		Gulu/Kitgum – Kampala-Busia border	Kenya
		Arua – Odromachaku border	DRC
		Gulu/Kitgum – Elegu border	South Sudan
	Districts in Eastern region (Mbale, Sironko, Amuria, Bukwo, Iganga)	Jinja – Busia/Malaba	Kenya
		Mbale – Lwakhakha/Busia/ Malaba Border	Kenya
		Mbale – Soroti – Lira – Gulu – Kitgum – Elegu/Nimule border	South Sudan
		Mbale – Soroti – Lira – Pakwach – Arua – Odromachaku border	DRC
		Mbale – Jinja - Kampala	Kampala
Rwanda	Northern and Western Provinces (including Gicumbi, Burera, and Rubavu districts)	Highways	Kigali, DRC, Uganda
	Eastern Province (including Nyagatare, Bugesera, and Gatsibo districts)	Highways	Kigali, Burundi, and Uganda
	Southern Province (including Nyamagabe, Ruhango, and Gisagara districts)	Highways	Kigali, Burundi
Tanzania	Southern Highlands	Mbeya – Dar-es-salaam Rd	Dar es Salaam/ Overseas
	Western Zone	Bukoba – Dar-es-salaam Rd	Dar es Salaam/ Overseas
		Bukoba – Mutukula border	Kampala (Uganda)
		Bukoba – Rusumo border	Kigali (Rwanda)
	Northern Zone	Arusha – Namanga border	Nairobi (Kenya)
		Tanga - Horohoro border	Mombasa (Kenya)
Ethiopia	Ethiopia	Moyale border	Kenya
	Ethiopia	Kurmuk/Matema borders	Sudan

Source: IEC, based on information from fieldwork

Value chain stakeholder analysis

Beans are produced on a small-scale, subsistence basis in East Africa. Bean producers normally cultivate on an average of 0.25 ha to 1 ha of land. Producers are mainly located in remote parts of the country from where they produce and sell their products to major towns. In Kenya, approximately 1.8 million households are involved in the production of pulses, and it is estimated that 85 percent of them are involved in growing common beans. The most commonly produced varieties are Rosecoco, Mwitemania, Wairimu, Mwezi Moja, and Nyayo, due to their higher adaptability to a wide range of ecological conditions, yields, and consumer preference.[61] However, small farmers often use unreliable or uncertified seeds, negatively affecting their production (both in yield and in quality). This situation is aggravated by the inadequate use of pesticides and fertilizers. Additionally, farmers have little information and understanding of the market and buyers' requirements.[62]

Assembling is done through different channels, through farm gate agents/brokers, who are either farmers who have accumulated some business capital, resident small-scale traders, or regional agents/traders who are often non-residents. A major problem affecting aggregators and traders is post-harvest loss, which can reach 25 percent of the quantity stored. This is mainly caused by the limited use of warehouses and certified storage facilities, as well as other physical post-harvest techniques suchas cleaning, sorting, grading, drying, polishing, and bagging.[63] According to AGRA (2013) "*at smallholder levels, suitable technologies for harvesting, transportation, drying, storing and primary processing of grain legumes are still underdeveloped*".[64] In Uganda, village assemblers/middlemen move around on bicycles and motorcycles collecting beans from the producers. The village assemblers in most cases are traders who buy beans and sell them to large-scale traders or transport the beans to major towns where big traders are concentrated. Village assemblers can also act as agents working on behalf of big traders for a commission. They collect and bulk beans from different farmers especially during the offseason and receive a commission for the same.

Table 9. Types of bean assemblers in Kenya

Farm-gate agents/ brokers/ assemblers	Medium level traders	Large Traders
Resident farm gate assemblers visit farms often at harvest time and buy beans in cash/ on credit. These assemblers handle relatively smaller volumes of 1-3 bags. The produce is then transported by buses or *matatus* to local urban centres for sale to regional traders.	These traders, who handle approximately 10 bags per business trip, purchase directly from farmers or the farm gate assemblers. The produce is then transported by one-ton pick-ups to the local market centres to sell to regional traders or their agents.	The large traders, who handle over ten bags per trip, often buy directly or through their agents from a variety of sources including small-scale farm gate resident assemblers or medium-level non-resident local traders.

Source: USAID (2010)

Wholesaling is undertaken by traders, either as individual or institutional business entities. They operate at several levels of the value chain: the rural assembling level, the regional level (long-distance assembler/wholesaler), and the consumer level.

Retailing of beans is often undertaken by small local traders at market centres in open marketplaces and cereal shops, as well as regional traders who buy from local traders/brokers and to some extent

[61] SNV (2012). The Beans Value Chain in Kenya. SNV, HIVOS and Solidaridad, August. Available from: http://www.fao.org/3/a-at264e.pdf
[62] ITC (2016). Kenya: Value Chain Roadmap for Pulses 2016-2020. International Trade Centre, Geneva.
[63] AGRA (2013). Establishing the Status of Post-Harvest Losses and Storage for Major Staple Crops in Eleven African Countries (Phase I), Alliance for a Green Revolution in Africa, Nairobi.
[64] *Ibid*.

farmers. However, mixed retailing and wholesaling is the norm for most bean traders, whether in small rural urban centres or larger urban centres.[65] Overall, markets lack proper structure and organization, partly due to the low levels of cooperation among the different players, and a lack of trust among the different stakeholders operating in the sector (farmers, traders, assemblers, and wholesalers). These factors lead to inefficient sector development and implementation of policies.[66]

A summary of the dry beans value chain across East Africa is given in Table 11:

Table 10. Overview of the beans value chain in East Africa

Country	Beans Value Chain description
Ethiopia	• Farmers start the primary aggregation process at the *kabele* (village) level markets, where they sell their beans. • Collectors consolidate beans from the different *kabele* markets (300-1,000kg), and aggregate in the *woreda* (district) towns. • Local wholesalers hire stores for aggregation (up to 5.5 tons) in the *woreda* towns, and these constitute the secondary markets. • Cooperatives are equally active at the primary and secondary market aggregation on behalf of the members. • Regional wholesalers move the product to regional towns such as Sheshamane and Awassa, and these constitute the tertiary markets and sourcing points for other wholesalers and exporters such as the Ethiopian Grain Trade Enterprise, institutions, and exporters on the Ethiopia Commodity Exchange.
Kenya	• Producers are mainly smallholder farmers using family labor. • Local buying agents do primary aggregation in the villages with small stocks in local stores. • Cooperatives are also involved in the aggregation and marketing of products as a service to their members and are also a buying point for the regional traders. • Regional buyers majorly from Nairobi, Mombasa, Nakuru, Kisumu, and Eldoret source the product from the local agents and cooperatives, aggregate and transport it to the urban markets. • The National Cereals Produce Board (NCPB) is a key player in the grains value chain, and also trades in beans. The board offers the services of drying, cleaning, fumigation, grading, and warehousing, and works through agents to source the beans. NCPB has a network of 110 warehouses across the country and a storage capacity of 1.8 million MT.
Rwanda	• Local agents procure and aggregate beans from farmers at centralized rural markets in the producer regions and trading centres along major highways to Kigali. • Larger scale traders source from local agents and are the main link to wholesalers and retailers in the major towns and Kigali City. • Some cooperative unions are also involved in the aggregation of beans. Institutions, traders, and exporters seeking large volumes use the cooperatives as buying and aggregation points.
Tanzania	• At primary aggregation, local buying agents buy directly from farmers at the farm gate or buying centres/markets where farmers will have taken their produce for sale to external buyers. • At secondary aggregation, large-scale traders purchase from the primary aggregators, load onto trucks, and transport to major markets in Dar Es Salaam, Mwanza, or Arusha, or for export to regional markets.

[65] ITC (2016), ibid.
[66] *Ibid*.

Country	Beans Value Chain description
	• In some regions, cooperatives aggregate produce on behalf of the member farmers and sell to traders.
Uganda	• Local buying agents in villages source from homesteads, or rural markets on behalf of middlemen or Area Cooperative Enterprises (ACEs). ACEs hire stores (5-10MT) in the rural trading centres and aggregate products for the larger traders and exporters. • Some cooperative unions in the producer regions produce beans as a secondary crop,[67] and aggregate and market on behalf of their members to large traders, exporters, institutions, and relief agencies. • Large scale traders from the urban areas source from the ACEs and cooperatives and aggregate in large stores in major towns/cities (Kampala, Mubende, Masaka, Gulu, Mbarara, and Mbale), and cross-border points such as Kabale, Busia, and Kasese for produce destined for Rwanda, Kenya and DRC respectively. • The traders also supply to exporting companies in Kampala who process (basic cleaning and grading), aggregate, and export to regional and international markets. • The mixed color beans are sourced from Rwanda (Ruhengeri region in the Northern Province – including Gicumbi district with highest % production). However, following the Uganda/Rwanda border closure, the beans are being routed through Tanzania by a network of traders in Rwanda, Tanzania, and Uganda.

Source: IEC, Information from fieldwork

A list of stakeholders and contact details is presented in Annex 3.

Key Findings on the Value Chain

Despite the existing potential for trade and food security, there are a number of constraints that hinder the impact that beans can have on communities:

- **Poor yield:** The low use of certified seeds, poor soil management, and inadequate use of pesticides and fertilizers lead to weak production in terms of yields and quality.
- **Big post-harvest losses:** Aggregators face significant post-harvest losses due to the limited use of warehouses and post-harvest practices such as cleaning, sorting, grading, drying, polishing, and bagging.
- **Poor quality extension services**: Extension services (seed production, seed storage, seed testing, and seed certification) would benefit the sector by achieving the objective of quality seed production and distribution.
- **Lack of organized marketing and information dissemination systems**: This leads to inefficiencies along the value chain, with farmers having little understanding of market and buyer requirements and often engaging in suboptimal contract arrangements.
- **Lack of linkages between research and the seed supply system**, which is leading to a higher presence of counterfeit seeds and a very low adoption rate (10 percent) of certified seeds.

National and Regional Policies

In **Ethiopia**, the **Agricultural Sector Policy and Investment Framework (2010-2020)** is a sectoral national policy, with objectives, among others, of a sustainable increase in agricultural productivity

[67] https://ugandafarmers.guide

and production; accelerating agricultural commercialization and agro-industrial development; reducing degradation and improve productivity; and universal food security. Additionally, in the pulse sector, the **National Pulses Strategy 2019-2024** aims to: improve sector productivity and quality through enhanced public and private support in research, input distribution, production, processing, and export; improve export competitiveness by strengthening backward production and planning by responding to market opportunities; and strengthen the capacity of sector stakeholders to improve value addition.

Kenya's Agricultural Sector Transformation and Growth Strategy (ASTGS) 2019-2029 sets nutritious foods which are affordable and available to all Kenyan households as the central goal of an agricultural transformation. The ASTGS lays down a methodology to identify the highest-potential value chains for agricultural transformation: (1) Income potential and dietary diversity for agricultural transformation and food security; (2) Kenya's agro-ecology and competitiveness; (3) National priorities beyond food production. On this basis, the ASTGS identifies 13 value chains with potential, namely: staples (maize, potatoes, rice, beans), horticulture (fruits, vegetables), livestock, and fish (beef, poultry, sheep/goats, camels, fish, dairy), and others (imported wheat).[68]

Rwanda's Vision 2050 National Development Strategy has among its six strategic pillars the "Productive and Market Oriented Agriculture". Through this, the Government of Rwanda (GoR) aims to replace subsistence farming with fully monetized and technology-intensive commercial agriculture and agro-processing by 2050.[69] Rwanda's Grain and Cereals Council (RGCC) aims to address the challenges that restrict trading in grain and cereals by establishing structured grain and cereals trading systems to improve the organization of national trade practices and to promote approaches to trade that help farmers, suppliers, traders, and processors to transform their business.

Tanzania currently has no specific policies dedicated to beans. However, there is draft legislation that requires all farmers to sell their produce to cooperatives, who eventually auction them to companies.

In **Uganda**, the government's plans and policies regarding beans include the Agriculture and Pulses sector Policy, under the National Development Plan II (NDPII, 2015/16-2019/20), the National Agricultural Extension Policy (NAEP), and the National Agricultural Extension Strategy (NAES). Specifically, the Agriculture and Pulses sector Policy focuses on strengthening agricultural research, technology adoption at the farm level, increasing access to and effective use of critical farm inputs, promoting sustainable land use, and soil management delivery.[70]

At the regional level, the Comprehensive Africa Agriculture Development Programme (CAADP) is Africa's policy framework for agricultural transformation, food security, and nutrition, amongst others. Some policies are affecting the trade of beans, including the EAC Bean Standards, the EAC Protocol on Sanitary and Phytosanitary (SPS) Measures, the EAC Common External Tariff (CET), and the COMESA Simplified Trade Regime (STR). The EAC Bean Standards and the EAC Protocol on SPS Measures provide the regional standards (non-tariff measures) that must be met for bean exports, while the CET and STR regulate on the tariff aspect.

From the consultation, some gaps in the policy framework are identified as lack of incentives for investment in bean production (Tanzania, Kenya), excessive taxation increases production costs and derogates product competitiveness (Tanzania), beans production not adequately profiled as a commercial crop in policy (Kenya), and cross-border trade bureaucracy for small scale traders due to non-participation in the STR (Ethiopia).

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[68] Government of Kenya (2019). Agricultural Sector Transformation and Growth Strategy, 2019-2029, Ministry of Agriculture, Livestock, Fisheries and Irrigation, Nairobi.
[69] The International Trade Administration (ITA), U.S. Department of Commerce. 2019. Rwanda Country Commercial Guide. Available at https://www.export.gov/article?id=Rwanda-Agriculture.
[70] CASA (2020). Beans Sector Strategy – Uganda. Casa Uganda Country Team. Available at https://www.casaprogramme.com/wp-content/uploads/CASA-Uganda-BeansSector-analysis-report.pdf

Recommendations

Recommendations for intervention specific to the beans value chain in East Africa are presented in the table below.

Indicative Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Establish input and extension services clusters/centre to distribute production inputs (certified seeds, inoculants, and fertilizers), cultivation good practices, and agricultural technologies. Conduct awareness-raising programmes to increase knowledge on the same	Enhanced access to improved varieties contributing to higher productivity and production; Improved quantity and quality of production.	Producers	Medium	Medium	Low	Medium	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF
Provide incentive programmes to support cooperatives and farmer groups in improving infrastructure for aggregation and storage, and mainstreaming bean production as a key cash crop through increased investment in technologies (improved seed, access to credit, farming practices, etc.)	Reduced post-harvest loss and loss incurred along the value chain; Improved quantity and quality of production; Strengthened market power and product knowledge base for the bean producers;	Producers, Traders	High	High	High	Medium-Long	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF, AfreximbankPrivate Sector
Promote contract farming linked to structured food markets. Create partnerships between producers and traders for better dissemination of market information. Provide incentives for the expansion of the bean processing sector with low-cost value-adding technologies available (e.g., pre-cooked beans) for the domestic and regional markets.	Enhanced market linkages, higher value-added for the production sector, and better-integrated value chains	Producers, Processors, Traders	High	High	High	Medium	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF, Private Sector

Indicative Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Establish centralized Market Information Centres for beans and other pulses, which can be built from pulses regional networks. Establish Spot Market in production zone and regional trading platform to facilitate agricultural trade in the region	Enhanced access to market and other production-related information; Better integrated value chain; Enhanced market linkages and information to allow all actors to actively participate in the value chains	Producers, Traders	High	Medium	Low	Short	Ministries/ Departments of Agriculture, East Africa Grain Council, FAO, IFAD, USAID, UKAID, BMGF, Private Sector
Improve the transport network; revive alternative transportation channels (water transport on regional waterways, railway link) to reduce transportation costs in the region	Reduced transport costs and enhanced market linkage from Producers to end-consumers	Producers, Traders, Exporters	High	High	(Very) High	Long	Ministries/ Departments of Agriculture, World Bank, TMEA, IFAD

**For Regional Food Trade; ** Investment level: Low (0-5 million); Medium (5-15 million); High (>15 million); ***Timeline (Short 0-2 years, Medium 3-5, Long 5+). Notes: BMGF = Bill & Melinda Gates Foundation.*

Source: Author's compilation

7. Beef Value Chain

Key consumption, production, and trade trends

Livestock is key to promoting economic resilience in East Africa. At the national level, livestock provides an average of 20-30 percent of the countries' GDP. At the farmer level, as much as 70 percent of cash income is generated from livestock. Livestock can also be a life saver in arid and semi-arid areas due to its ability to withstand severe fluctuations in weather patterns.[71] For example, in Tanzania, livestock contributes about 30 percent of agricultural GDP, out of which about 40 percent is derived from beef production. Cattle farming fulfills an important function in coping with shocks, accumulating wealth, and serving as a store of value in the absence of using formal financial institutions[72].

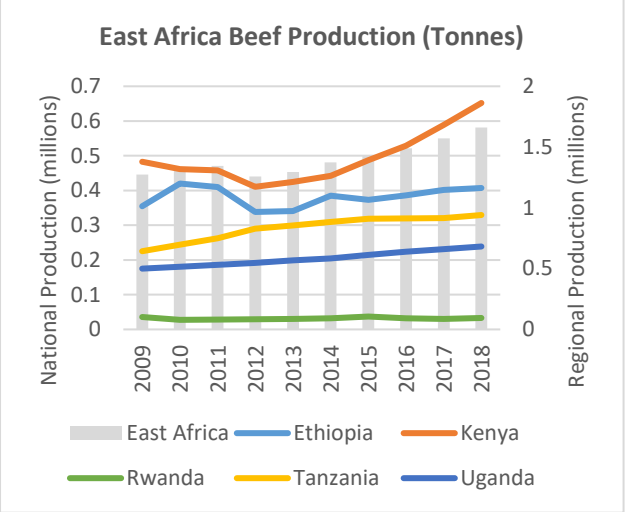
There is significant potential for livestock in the Eastern Africa Region. By 2030, the East African beef demand is projected at 2.7 million tons. Africa's consumption is expected to be at 34.8 million by 2050 and the increase in the volume of meat consumed will be at par with that of the developed world and Latin America. The African livestock markets hold the potential for generating major business opportunities for livestock producers, in many cases larger than those of other world regions.[73]

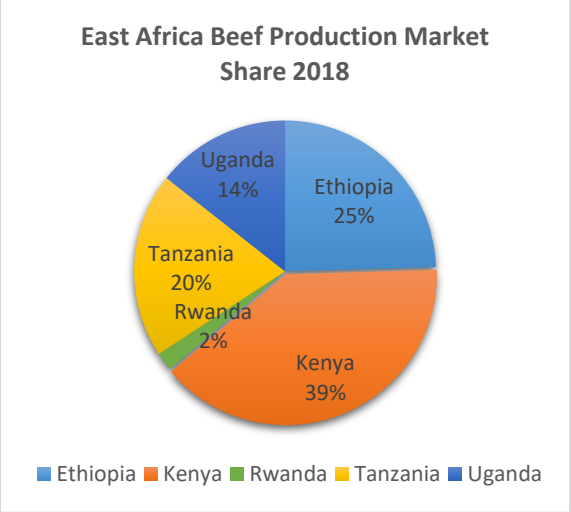
Beef is a direct source of income for a large segment of the rural population. Livestock is a principal way of alleviating rural poverty. Livestock keeping in Tanzania is a pivotal rural activity whereby more than 80 percent of households keep cattle, goats, or sheep.[74] Similarly, Kenya's production of beef is mainly concentrated around arid and semi-arid land (ASAL) areas, which account for 70 percent of total production, mainly through pastoralists. It is also the primary source of livelihood for approximately six million pastoralists and agro-pastoralists that live in the country's ASAL. Production areas are mainly located in arid and semi-arid areas such as the Masai steppe (Tanzania), Karamajong (Uganda), and ASAL of Northern Kenya.[75]

Kenya, Ethiopia, and Tanzania are the major beef producers, together accounting for 84 percent of the beef production in East Africa. Kenya has the region's largest production (39 percent of the regional market) with 652,010 tonnes in 2018, followed closely by Ethiopia, which produced 407,301 tonnes (25 percent of the regional market), and Tanzania with 329,372 tonnes of beef. Total beef production in East Africa has been growing at an annual average rate of 3.1 percent over the last 10 years. The highest growth has been in Kenya; a 10 percent increase from 2014 to 2018.

[71] EAFF (2012). Eastern Africa Livestock Strategy. Eastern Africa Farmers Federation.
[72] For an overview of existing market information systems, see Annex 4.
[73] FAO (2013). Investing in African Livestock: business opportunities in 2030-2050. World Bank, FAO, ILRI, AU-IBAR.
[74] United Republic of Tanzania (URT) (2015). Tanzania Climate Smart Agriculture Programme Coordinated by Ministry of Agriculture Food Security and Cooperatives and Vice President's Office, Dar-es Salaam.
[75] CTA (2017). Mapping Livestock Value Chains in the IGAD Region.

Figure 12. Beef Production in East Africa





Source: FAOSTAT

The East Africa Region exported an average of USD 11.6 million during the 2014-2018 period. Kenya and Ethiopia are the largest beef exporters with 52.5 percent and 33 percent of the export market, respectively. Kenya's main export markets are Tanzania (35 percent of total beef exports), South Sudan (29 percent), and DRC (17 percent) in the form of frozen beef. Ethiopia exports beef to the United Arab Emirates (UAE) (64 percent) and Bahrain (26 percent). Ethiopia's exports of beef nearly disappeared between 2014-2016 due to a ban imposed on its exports and severe drought. In October 2015, the United Arab Emirates, Ethiopia's largest meat export destination by then, officially banned meat exports due to non-compliance with health regulations.[76] In 2017, a drought affecting pastoralist communities, which contribute the highest share of Ethiopia's cattle population, halved meat exports.

Intra-regional beef trade in East Africa is quite low, amounting to an annual average of USD 5.6m with very few countries involved in this activity. Kenya dominates exports in the EAC region with an average of 96 percent of the market. Tanzania is the main importer of beef from the region, representing more than 95 percent of the regional imports. According to ITC Trademap statistics, the only other country importing beef from the region is Uganda. The main reason for the low level of recorded official trade could be explained by the existence of informal trade across borders, or disease prevalence, and lack of export-standard abattoirs.[77]

Informal trade of beef cattle is an enduring problem and thus has constrained input supply for formal exports. Although it is nearly impossible to quantify informal trade, it is estimated that informal trade in live animals from Ethiopia, for example, accounts for 75-80 percent of all live animal trade, with the informal trade value estimated to reach over USD 200 million.[78] The immediate destinations of this illicit export are surrounding Djibouti, Somalia, Sudan, and Kenya, which further re-exported to the Middle East countries after domestic demands are met.[79] Several factors contribute to informal trade, such as the cumbersome system of export license and taxes, the ban of cattle exports, the lower transaction and transportation costs for informal trade, no quarantine requirements, as well as circumvention of foreign currency controls.

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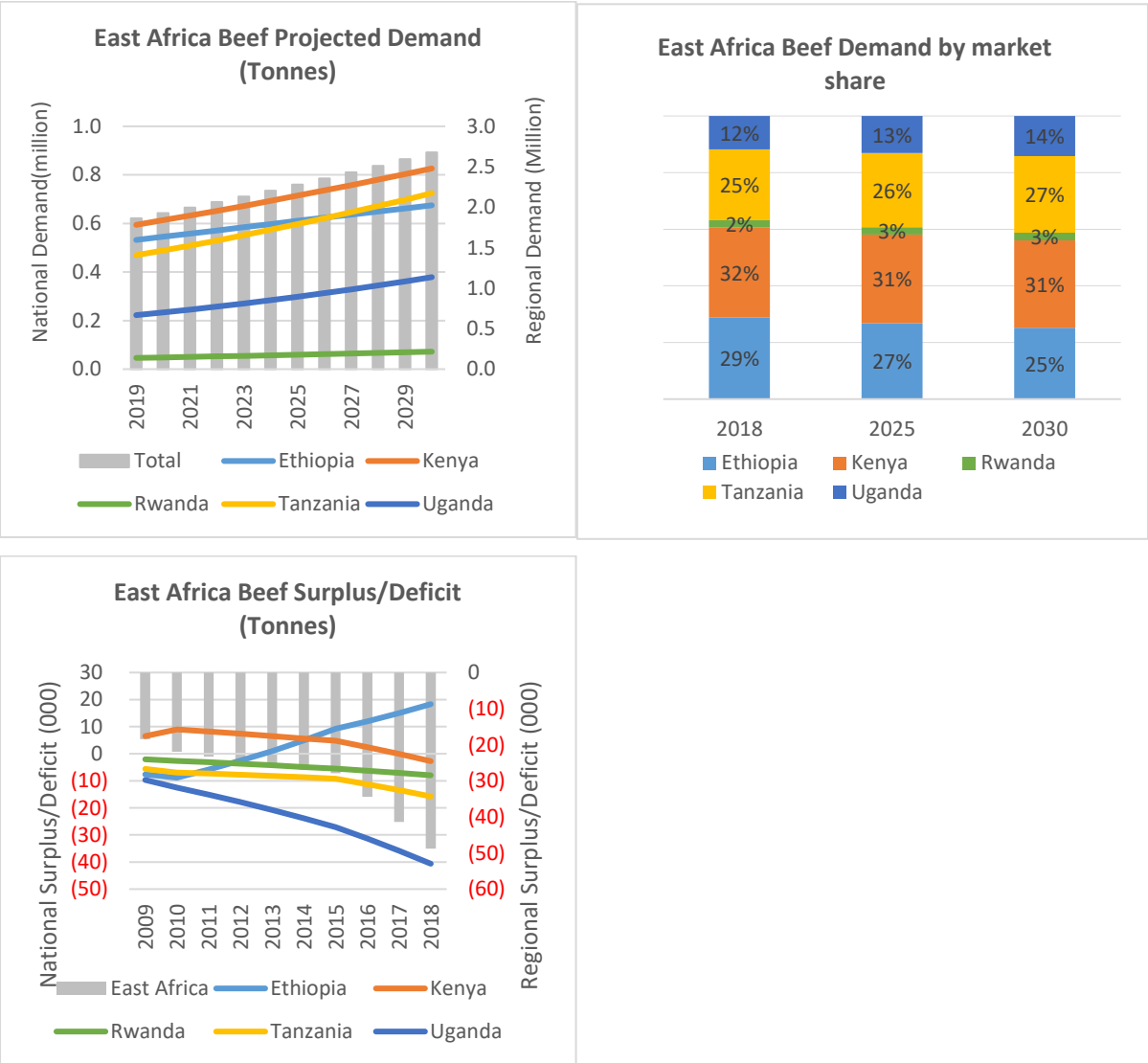
[76] Kassa, L. (2015). UAE Imposes Indefinite Ban on Ethiopian Meat Exports. Fortune, October 5. Available from: https://addisfortune.net/articles/uae-imposes-indefinite-ban-on-ethiopian-meat-exports/
[77] [77] CTA (2017), *ibid*.
[78] USAID (2013), *ibid*.
[79] Ayalew, W (2006). Getting the incentives right: concerns associated with expansion of cattle export markets in Ethiopia. Ethiopian Journal of Animal Production 6(2):99-103.

The overall demand for beef in East Africa was 1.8 million tonnes in 2018 with an average annual growth rate of 3.4 percent. The highest demand growth has been experienced in Rwanda and Uganda with an average annual growth of 4.5 and 4.7 percent, respectively. According to IFPRI projections, the overall beef demand is expected to increase by 1.3 times in 2025 and 1.5 times in 2030 compared to the 2018 figure. The total demand in the East African region is expected to reach 2.7 million tonnes in 2030. Kenya, Ethiopia and Tanzania will have the highest demand for beef (absolute value) despite a slight drop in their shares in 2025 and 2030 (Figure 13).

Figure 13. Beef Demand in East Africa



Source: IFPRI

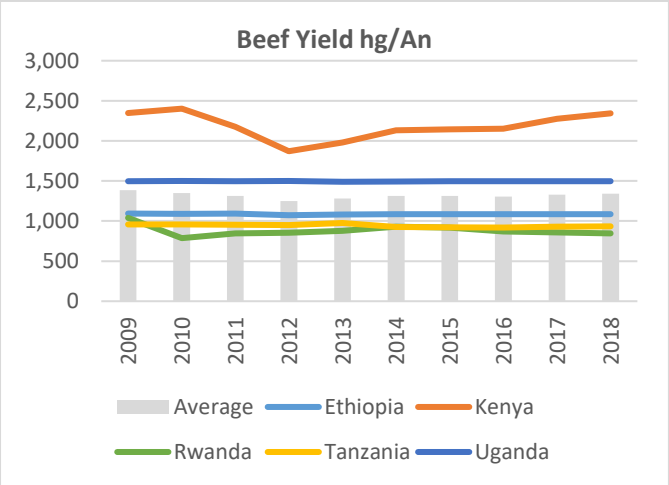
Overall, the projected increase in the demand for meat across East Africa will be due to an increase in projected population growth. Some governments expressed confidence that abattoirs would spur the meat business in the country due to the high demand for quality beef by consumers. Slaughterhouses would also create employment for residents, in addition to being a key source of revenue for the county governments. Exports out of the region could be an incentive for growth and a driver of export diversification, as in the case of Kenya's deal to export meat products to China.[80]

[80] JICA (2017). Project for Master Plan on Logistics in Northern Economic Corridor – Final Report. Japan International Cooperation Agency, March.

Key regional competitiveness drivers and challenges

Among the group of countries studied in East Africa, Kenya is the most competitive beef producer with yield levels (2,344 hg/An) comparable to that of the second world beef producer - Brazil (2,500 hg/An), and Argentina (2,2279 hg/An), the 6th world beef producer. However, Kenya's yield is much lower than that of South Africa, which is 2,933 hg/An.

Figure 14. Beef Yield in East Africa



Source: FAOStat

Apart from Kenya, the yield levels for the other four countries have not changed in the last 10 years. Rwanda and Tanzania are the least competitive beef producers in the region. The low level of competitiveness in the beef industry in East Africa is attributed to a number of problems that affect different levels of the value chain. Table 13 provides a summary of the problems related to the beef value chain in East Africa.

Figure 15. Analysis of the competitiveness of EAC beef and movement across countries

Source: Analysis by International Economics Consulting Ltd.

Regional Transportation and Logistics Routes

The main trade and transportation routes for meat in East Africa are given in Table 11.

Table 11. Transportation and trade routes for meat in East Africa

Country	Starting Point (Live animals)	Corridor(s) / Roads Used	Destination
Ethiopia	*Licensed Abattoirs*	*Addis – Modjo- Djibouti (rail)*	*Middle East market (Dubai, Saudi Arabia, Yemen)*
		Airfreight	*North Africa, DRC, Congo Brazzaville, Egypt*
Kenya	*North-Eastern Region*	*Moyale – Isiolo – Ethiopia - Somalia + Djibouti*	*United Arab Emirates*
		Nairobi	*Nairobi Abattoirs*
		Nairobi – Mombasa highway	*Mombasa Abattoirs*
	Kajiado /Narok	*Bomet – Narok – Nairobi route*	*Nairobi*
		Namanga – Nairobi Route	*Tanzania*
	Rift valley region	*Nakuru – Nairobi route*	*Nairobi*
Rwanda	*Kigali*	*Kigal roads*	*Kigali*
	Kigali	*Rubavu to Grand Barriere*	*Goma in DRC*
	Kigali	*Rusizi border*	*Bukavu DRC*
	Kigali	*Airfreight*	*Congo Brazzaville*
Tanzania	*Mwanza (ANIPRO Abattoir)*	*Shinyanga – Singinda - Dodoma – Morogroro - Pwani*	*Dar-es-salaam*
Uganda	*Western region*	*Northern Corridor*	*Kampala, Rwanda, DRC, Burundi, Tanzania*
	Central region – Nakasongola, district	*Gulu Highway – Kampala – Jinja – Busia/Malaba Border*	*Kenya*
		Gulu Highway	*Kampala*
	Mubende district	*Hoima High way*	*Kampala*
	Eastern region	*Kumi – Soroti – Lira – Gulu- Elegu/Nimule Border*	*South Sudan*
	Karamoja sub region livestock markets in Moroto, Nakapripripit, Kotido, Napak, and Amudat	*Amudat border - Trekked for two days to Kishwanet (in Kenya) - loaded onto trucks - Kapenguria, Kitale - Eldoret, and Nakuru.*	*Dagoretti market/Kenya*
		Soroti – Lira – Gulu – Kitgum - Elegu	*Juba/South Sudan*
		Soroti/Mbale route – Bukedea Cattle markets	*Jinja, Kampala*

Country	Starting Point (Live animals)	Corridor(s) / Roads Used	Destination
		Soroti/Mbale route - Busia	*Kenya*
	Eastern Region (Cattle markets in Soroti, Katawki districts)	*Soroti – Moroto - Amudat*	*Kenya*
		Soroti - Lira – Gulu – Kitgum - Elegu	*Juba/South Sudan*
		Soroti/Mbale route – Bugiri/Bukedea	*Jinja, Kampala*

Source: IEC, Information from fieldwork

Value Chain Stakeholder Analysis

East Africa has complex meat and live-animal value chains with various players, including producers, collectors, small private and cooperative fatteners/feedlots, middlemen, livestock trading cooperatives, individual traders, and exporters.

There is no reliable or sustained relationship among actors within this value chain. Most relationships are casual. There are very few well-developed backward-linked relationships from processors to traders and producers, which, therefore, requires a restructuring of the business model.[81]

The majority of producers in East Africa are often located in rural areas with limited access to market and infrastructure, lack of market and pricing information. Many producers only go to the market whenever they have financial difficulties or face drought. In Kenya, for example, pastoralists sell their production at the end of the rainy season, when animals have reached optimal body condition and weight.[82] This practice keeps products off the market and represents sub-optimal production management, while at the same time limiting the producers' bargaining ability.

Commercial ranches are limited and play the role of both livestock producer and fattener. Commercial ranches, such as the Solio and Sosian ranches in Laikipia and Soysambu, Kenya, are conservancies for wildlife in addition to providing grazing for Boran and other indigenous cattle. Animals raised in these ranches are targeted at the high-end market because of their good finish, which ensures high-quality carcasses. Group ranches also exist, entailing the joint ownership of land on which individually-owned livestock are herded collectively, and stocking levels are agreed to collectively.

The market is composed of both large and small traders. Large traders, few in number, purchase large numbers of animals from a variety of sources to supply their key buyers (abattoirs and exporters). Usually, just one or two big traders operate in a certain area and may often collude to divide the markets to avoid competition and increase prices. Smaller traders, on the other hand, dominate the beef sector and provide markets for numerous smaller collectors. Some small traders provide animals for the larger traders' networks, especially for the export market. Small traders have little working capital, leading to reduced purchase capacity. They also often don't own transport vehicles and access to detailed market information.

Most of the livestock cooperatives operate in the shoats' markets[83] because of the low financial requirement in doing so. Trading cooperatives mainly operate as the marketing arm of their members. Some of the main problems faced by cooperatives include (1) dysfunctional organizational setup and management systems, (2) dependence on few buyers, (3) financial

[81] AGP-LMDP (2013(. Value chain analysis for Ethiopia: meat and lives animals; hides, skin and leather; dairy. Agricultural Growth Project – Livestock Market Development Programme. Available at https://www.usaid.gov/sites/default/files/documents/1860/AGPLMD%20Value%20Chain%20Analysis.pdf

[82] Farmer, E. & Mbwika, J. (2012). End Market Analysis of Kenyan Livestock and Meat: A Desk Review. USAID, micro report #184, March.

[83] Shoats market refers to the pig/piglet market

constraints, (3) lack of market information, (4) inadequate training, and (4) lack of entrepreneurial skills to compete in the market with individual traders.[84]

The involvement of brokers/middlemen in many segments is an important feature of livestock markets in East Africa. In remote rural areas, brokers are critical links to the markets for smallholders. In urban areas, brokers do not play an important role, despite their frequent involvement in many transactions. There is also concern about "illegal traders", or unlicensed individuals without previous market knowledge, acting as brokers who distort the market in their favor. Most brokers lack the necessary licenses to operate, and the regulatory authorities do not enforce the licensing requirements.

Abattoirs are an important link in the processing of meat. In Ethiopia, there are nine export abattoirs, of which only five are currently functional. All abattoirs have facilities for sheep and goats, but facilities for cattle are limited, and none of the export abattoirs is exporting beef. Traders and agents supply the animals to these abattoirs. Kenya has two formal types of slaughterhouses and abattoirs, depending on whether the meat will be consumed domestically or exported. Most of the cattle, however, are slaughtered informally, lacking the necessary sanitary controls. The Kenya Meat Commission owns the biggest formal slaughter and meat processing facilities for modern distribution in urban areas. In Nairobi, most cattle are sold at the Dagoretti and Njiru markets. In Tanzania, there is no abattoir in the Monduli and Longido districts. A modern abattoir in Arusha City is owned by the Arusha City Council and thus provides formal slaughter services to butcheries and the general public. This abattoir buys cattle directly from secondary markets, national ranches, and livestock farmers.

Box 3 Overview of major players in East Africa's value chain for beef

- *Producers: Solio and Sosian ranches in Laikipia and Soysambu (produce beef for High-end Market) (Kenya); NARCO (National Ranching Corporation) and other private ranches (Tanzania). NARCO provides a minor exception to the generality of vertical integration (Tanzania).*
- *Research: Uyole Livestock Research Centre, Iringa Veterinary Investigation Centre (Tanzania).*
- *Feed Manufacturers and suppliers: Energy Millers and Animal Feeds, MIFUGO (Ministry of Livestock Development) (Tanzania).*
- *Processors: Sumbawanga Agricultural and Food Industries Limited (SAAFI) (Tanzania); Kenya Meat Commissions (owns the biggest formal slaughter and meat processing facilities for modern distribution in urban areas).*

Value chain enablers also represent a key element in the development of the livestock value chain. These actors comprise national and subnational government authorities who play a significant role in creating conducive policy and regulatory environments that provide an incentive for all other value-chain actors. Regional-and international-level institutions, communities, and associations play the crucial role of supporting and complementing country-level livestock value-chain efforts in the East African Region.

At the regional level, there are multiple organizations such as the African Union's Inter-African Bureau for Animal Resources (AU-IBAR), the African Livestock Platform (ALive), the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Intergovernmental Authority on Development (IGAD), North Eastern Africa Livestock Council (NEALCO), and the Eastern Africa Farmers Federation (EAFF), etc. These undertake multiple tasks such as harmonization of policies and regulations to facilitate livestock trade, implementation of regional and

[84] Farmer, E. & Mbwika, J. (2012), *ibid*.

continental projects, programmes, and others. Research and learning institutions, knowledge hubs, and policy think-tanks at country, regional, and international levels generate knowledge to inform policy and decision-making and are also involved in the provision of technical support to the livestock value-chain initiatives. Table 12 below provides a summary of the main actors involved in the beef value chain in East Africa.

Table 12. Actors along the beef value chain

Primary Actors	Description
Producers	• Include pastoralists, small-scale producers, ranchers, and local producer organizations. • Involved in primary stages of livestock production. Often, they are organized into a local producer-based organization such as local chapters of dairy cooperatives that might be linked to national-level producer organizations.
Local Agro-dealers	• Include local businesspeople who supply inputs such as veterinary drugs, animal feeds, and production equipment.
Local Livestock Traders	• Buy livestock and livestock products from producers and sell them locally or to other markets. Include truckers, middlemen, transporters, international meat traders, etc.
Livestock Product Processors	• Involved in primary-level processing of livestock and livestock products. Include slaughterhouses, slab operators, local tannery operators, etc.
Livestock products distributors/ traders	• Provide the final link to consumers in the value chains.
National Livestock Organisations	• Provide an avenue for value-chain actors to come together: either as homogenous, multi-stakeholder groups that address issues affecting specific nodes; or collectively as value-chain actors. Include cooperatives, commodity associations, etc.
Value Chain Enablers	
Livestock Extension Services	• Government departments are involved in providing veterinary services and extension to local producers. • Community-based animal health workers (CAHWs) provide veterinary services in remote areas that are rarely reached by formal veterinary officers. • R&D services from National research institutions that provide research solutions for problems in livestock value chains.
Other Actors	• Local government authorities enforce regulatory requirements and regulate local markets. • National governments and the ministries responsible for livestock set the overall legal, policy, and regulatory framework for the development of value chains. • Policy think-tanks are responsible for providing policy solutions to livestock sector challenges. • Development partners who provide financing for value chain development and support for the regional development agenda at local, national, and regional levels. • Oher regional institutions responsible for setting the integrated regional development agenda including livestock value chains (e.g. IGAD, EAC), specific issues (e.g. ICPALD), or research (e.g. ILRI).

Source: Compiled from CTA85 and EAFF86

[85] CTA (2017), *ibid.*
[86] Eastern Africa Farmers Federation (EAFF) (2012). Eastern Africa Livestock Strategy, August 2012.

A list of stakeholders and contact details is presented in Annex 3.

Key Findings on the Value Chain

Fieldwork and research found constraints to the livestock value chain vary across space and scale. For instance, there are more constraints at the local level than at the national level due to larger technical, organizational, and financial challenges. Similarly, in comparison, small-scale farmers face more constraints than large-scale farmers. There are also varied constraints across livestock farming systems, with the pastoral livestock systems in the ASAL region facing more severe livestock constraints than the agropastoral and mixed farming systems due to climatic, socio-economic, political, and infrastructural challenges.[87] Despite efforts being made to address these constraints, many gaps still exist. Table 13 summarises the challenges faced by various actors across the beef value chain in East Africa.

However, projections suggest that the sector has the potential to provide increased employment opportunities. The projected rise in demand for animal-source foods will boost the number of value-chain operations along which (self and wage) employment opportunities should be created for young women and men in rural areas. To take advantage of these opportunities, there is a need to increase their access to land, technologies, credit and other financial facilities, technical know-how, education, and skill development. More efforts are required to address the challenges among the poor smallholder livestock keepers in the pastoral and agro-pastoral systems as this group seems to be the most affected.

Table 13 Challenges across the beef value chain

Level in value chain	*Challenges*
Primary Actors	
Production	*Lack of/limited access to credit by livestock keepers; limited access to animal genetic resources for quality breeding; limited access to feeds especially during dry seasons; inadequate access to water for livestock; limited access to livestock extension services; animal health challenges (limited capacity for disease prevention, surveillance, and control); lack of dipping facilities; low adoption of improved technologies.*
Processing	*Processing: Lack of or unreliable electricity in some areas; lack of quality slaughterhouse facilities;[88] lack of technical and knowledgeable manpower in the meat processing industry; lack of or inadequate enforcement of standards and quality control by producers; high cost of support factors of production (e.g. water, power, diesel and packaging materials); seasonality of production – dry season versus wet season; high cost of inputs and packaging material*
Marketing and Market Structures	*Marketing: poor livestock marketing infrastructure; poor market organization; lack of quality livestock information systems; inadequate capacity to participate in regional and international trade in livestock and livestock products; inefficiency in the marketing chains; non-tariff barriers to livestock trade; lack of or poor quality infrastructure (e.g. watering facilities, holding grounds, roads, stock routes, and export-level abattoirs); inadequate capacity to meet sanitary requirements related to the livestock and meat trade; international trading bans; high transaction costs in market systems.*

[87] CTA (2017), ibid

[88] For example, Tanzania's Controller and Auditor General (CAG) 2016/17 audit report revealed that about 98 percent of the slaughterhouse facilities in the country are not registered and maintain a poor hygienic process. According to https://www.africanfarming.net/livestock/pigs/about-98-per-cent-of-slaughterhouses-in-tanzania-are-unregistered-cag-report

Level in value chain	Challenges
	Capacity needs: limited access to affordable credit facilities for traders and producers; weak institutional and organizational capacity for trader associations *Governance: limited organizational capacity of producer groups; lack of market information.*
Retailing	*The low purchasing power of consumers; low per-person consumption of livestock products.*
Value Chain Enablers	
State Support Services	*Programming/planning and strategy design: Inadequate funding; lack of livestock data; unreliable data on livestock indicators; low prioritization of livestock in development programmes and strategies; limited capacity and commitment for evidence-based planning, and monitoring and evaluation. Implementation capacity of policies, projects, and programmes: the limited capacity to institute effective project implementation; limited law enforcement capacity; inadequate institutional coordination mechanisms among actors; inadequate inter-agency and inter-sectoral cooperation; and inadequate coordination between national- and local-level actors.*
Private Support Services	*Lack of an enabling environment for private-sector investments in livestock interventions; limited access to credit; the existence of tariff and non-tariff barriers; weak policy implementation; ad hoc policy interventions*
REC support	*Limited financial, technical, and human resources capacity that limits the ability of Regional Economic Communities (e.g. AU-IBAR, IGAD, COMESA, and EAC) to effectively implement their responsibilities; lack of a structured legal framework to coordinate the legal relations between AU, RECs, and member states.*
Research	*Inadequate research on livestock and weak researcher– extension–farmer links; lack of livestock data; inconsistent/unreliable data on national livestock indicators; low prioritization of livestock in development programmes and strategies.*

Source: IEC based on Data from fieldwork & CTA (2017)

Recommendations

Recommendations for intervention specific to the beef value chain in East Africa are presented in the table below.

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Formulate programmes to improve feed resources and feeding packages to increase feeds and water availability for year-round feeding, improve utilization of indigenous breeds, and improve adoption of technologies and innovations for improved livestock production. Facilitate the establishment of a regional disease	Improving livestock productivity in agro-pastoral and pastoral systems	Producers	Medium	High	Medium	Medium	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
surveillance and control system for the prevention and control of epidemic diseases							
Organize livestock producers in agro-pastoral and pastoral systems into associations or clusters with organizational and management structures for sharing good practices, enhancing business skills, facilitating access to financial services (credit system, livestock insurance), improving knowledge for business competitiveness, risk, and benefit-sharing along the value chain	Enhanced access to production capital contributing to higher productivity and production; Better managed organizational capacity of agro-pastoralists and pastoralists to enhance their bargaining power in input/output markets	Producers	High	High	Low	Medium	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF, AfreximbankPrivate sector
Increase investment in slaughter facilities/abattoirs in the producer regions, with a focus on upgrading sanitation conditions at the abattoirs /slaughterhouses and cold chain supply systems to international standards	Improved processing capacity and quality to be in line with international standards	Processors	High	High	High	Medium	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF, Private sector
Improve the market information, using technology to generate close to real-time databases and analysis of trends to guide future investment strategies in the livestock sector. Develop private-sector enterprises/platforms that link pastoralist cattle to markets in cities can provide producers with higher and more reliable incomes	Better integrated value chain Better opportunity for producers and traders of livestock at remote areas to exploit new markets and be better informed in making production decisions and price negotiations	Producers, processors, traders	High	Medium	Medium	Short	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF, Private sector

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Formulate agenda and programmes for the development and harmonization of regional standards and regulations that affect market access due to lack of clarity and conflicting standards and regulations governing trade in livestock production within the region	Harmonized regional standards and regulations	Producers, processors, traders	High	Medium	Medium	Medium-Long	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF

**For Regional Food Trade; ** Investment level: Low (0-5 million); Medium (5-15 million); High (>15 million); ***Timeline (Short 0-2 years, Medium 3-5, Long 5+). Notes: BMGF = Bill & Melinda Gates Foundation.*

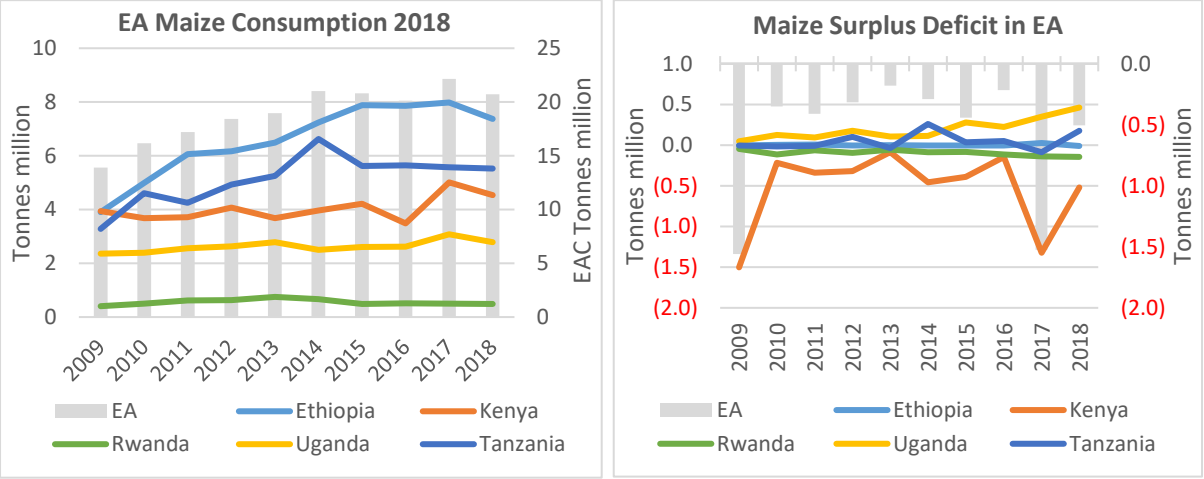
Source: Author's compilation

8. Maize Value Chain

Key consumption, production, and trade trends

Maize is a key staple cereal crop in East Africa where it accounts for nearly half of the calories and protein consumed.[89] Kenya and Tanzania are among the highest maize consumption countries in Africa with, 103kg/capita/year and 73kg/capita/year respectively,[90] followed by Ethiopia with 47kg. These three countries accounted for more than 84 percent of the regional maize consumption in 2018, with Ethiopia being the highest consumer in terms of volume. Maize consumption has been increasing at an average annual rate of 5.5 percent. The region has an annual average deficit of 0.6 million tonnes of maize levels over the last 5 years, with the highest deficit being in Kenya (0.53 million tonnes). Kenya, Mozambique, Rwanda, and Zimbabwe have a structural maize deficit, which is compensated by food imports.[91] Uganda and Tanzania have had surpluses during the last five years. It is expected that the increase in maize consumption for food will be more acute in Rwanda and Uganda due to the increasing costs of staples like bananas in Uganda and government support in the production of non-traditional food for food security.[92][93]

Figure 16. Maize consumption in East Africa



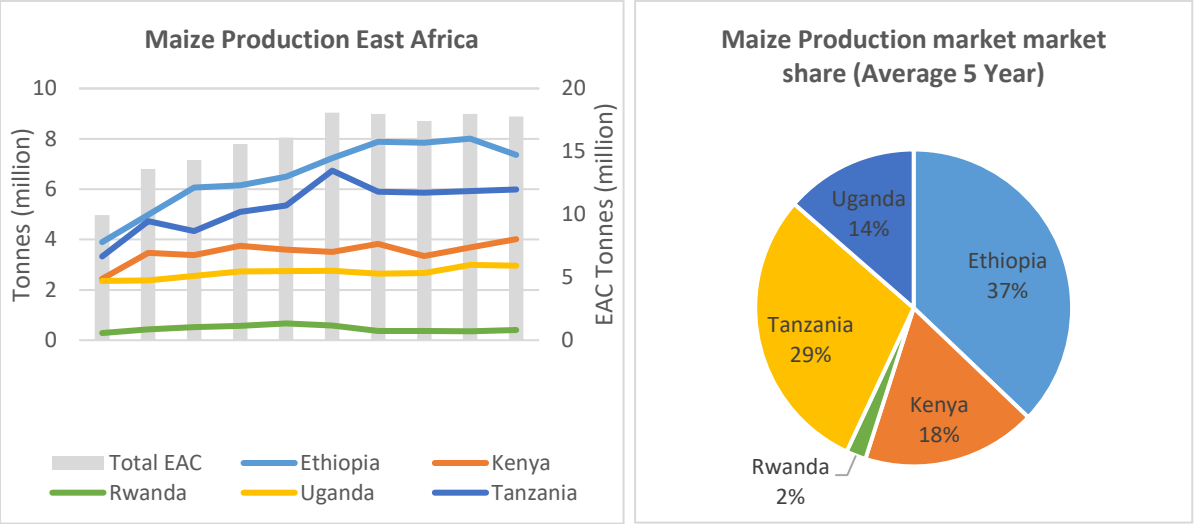
Source: Calculated from FAOSTAT and ITC Trademap

Maize also plays a central role in food security in the region. In Kenya, maize represents a larger share of the household diet, accounting for 42 percent of the dietary energy intake and 68 percent of the daily per capita of cereal consumption. The growth of the feed milling industry in the region mainly for poultry and cattle further increases the demand for maize.[94] In Tanzania, maize represents 60 percent of the dietary calories. In Rwanda, 50 percent of the maize produced is consumed by producers, while the figure for Uganda is only 20 percent. The popularity of maize in Ethiopia is due to its high value as a food crop as well as the growing demand for the stover as animal fodder and a

[89] J. Daly, D.Hamrick, G.Gereffi, A. Guinn (2016). Maize value chains in East Africa, International Growth Centre, October 2016. F-38202-RWA-1
[90] Peter Ranum (2014). Annals of the New York Academy of Sciences, Global maize production, utilization, and consumption, March 2014
[91] Kornher Lukas (2018). Maize markets in Eastern and Southern Africa (ESA) in the context of climate change, The State of Agricultural Commodity Markets, 2018
[92] Kilimo Trust (2017). Characteristics of Maize Markets in East Africa: Regional East African Community Trade in Staples (REACTS)
[93] For an overview of existing market information systems, see Annex 4.
[94] Kilimo Trust (2017), ibid.

source of fuel for rural families. Approximately 88 percent of maize produced in Ethiopia is consumed as food, both as green and dry grain.

Figure 17. Maize production in East Africa



Source: FAOSTAT

Maize production has increased by 68 percent over the last ten years. Since 2014, the production volume has been around the 20 million tonnes mark. Ethiopia is Africa's 3rd largest producer and the main producer in East Africa, accounting for 37 percent of the market share (with a 5-year average of 7.6 million tonnes/year), followed by Tanzania (6.1 million tonnes/year) with 30 percent of the total production. Kenya accounts for 19 percent of the production with a volume of 3.7 million tonnes annually. However, production growth rates have slowed down in the last 5 years, to an average of 2.1 percent for the region. Despite growth in volumes, the deficit in the region is attributed to Uganda's supply of maize to DRC, poor post-harvest handling practices, and maize channeled to the growing animal/livestock feed sector.[95]

Maize production has been affected by multiple reasons. Recent droughts have decimated Kenya's production. In 2012, Kenya produced 3.6 million tonnes of maize. Whilst production increased to 3.83 million tonnes in 2015, this decreased to 3.3 million tonnes in 2016. In 2019, maize production was minimal, ranging between 1-10 percent of the five-year average across counties, except for Meru (Meru North), where current production is 29 percent of the five-year average.[96]

Maize trade in the region is dominated by regional trade. The share of regional imports of maize from the region as a percentage of total maize amounted to 75 percent for a 5-year average (2014-2018). Imports of maize in the East African region have been fluctuating over the last 10 years based on the variations in demand levels. As indicated in the graph below, Kenya's import has largely influenced the volume of maize imported in the region.

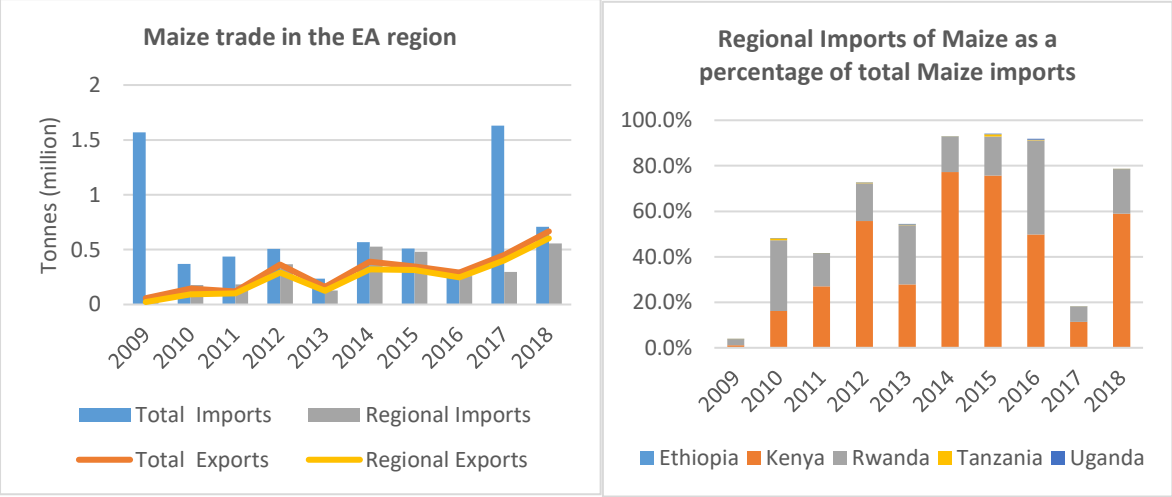
Kenya is the region's biggest market, which absorbs most of the regional surplus (74 percent of maize originating from the region and 60 percent of total maize imports for the EA region). Between 2014 and 2018, Kenya accounted for on average 87 percent of the total maize imports in the region. The country imported the second-highest volume of maize in Sub-Saharan Africa after Zimbabwe. Kenya imports the majority of its maize from Uganda (63.5 percent of total maize imports in 2018), Zambia (20 percent) and Tanzania (15.5 percent). However, the country is prone to import surges as

[95] Kilimo Trust 2017.
[96] FEWS Net (2019). KENYA Food Security Update: August 2019. Famine Early Warning Systems Network.

a result of maize shortages, such as the ones experienced in 2008-2009[97] and 2017-2018[98], during which Kenya had to resort to countries such as South Africa and Mexico as sources of maize. In 2009, Kenya imported a total of USD 462.7 million worth of maize, a fourfold increase in comparison to 2008 imports (USD 106 million), of which USD 306 million came from South Africa. In 2017, the country imported USD 406 million in maize, and while it relied more on regional markets, it imported USD 184 million from Mexico.[99]

On the other hand, **Uganda is Africa's third-largest exporter of maize and second-leading exporter of maize flour.** Uganda supplied 67 percent of the maize (0.42 million tonnes in 2018) to the EA region from 2014-2018. Potential exists for Uganda to further supply maize to its partners.

Figure 18. Maize trade in East Africa



Source: ITC Trademap (Total Exports/Imports: imports and exports into /by the 5 countries from/to the rest of the world)

In Ethiopia, despite its leading position in maize production in East Africa, maize exports are not encouraged. Exports of maize, as well as other grains such as teff and sorghum, were banned in 2008. The ban was lifted in 2010, re-imposed in 2011, and remains in place currently.[100] The ban is a part of the government's policy to stabilize the country's staple food prices.[101] Exports are only allowed when there is a bumper harvest, or in case of drought in neighboring countries. For example, limited maize exports were allowed in 2017 following bilateral discussions between the governments of Kenya and Ethiopia to support Kenya during a recent drought.

[97] Short C., Mulinge W. & Witwer M. (2012). Analysis of incentives and disincentives for maize in Kenya. Technical notes series, MAFAP, FAO, Rome
[98] Njeru, T. N. (2017). Why Kenya's short-term fixes won't resolve its maize supply crisis. The conversation, October 24. Available from: https://theconversation.com/why-kenyas-short-term-fixes-wont-resolve-its-maize-supply-crisis-85548
[99] It is also worth noted that Kenya imported maize under various commodity categories, including maize oil, maize starch, maize groats, corn flour, maize seeds, and other residues of maize, etc.
[100] Maize export ban was lifted for a short period in 2017 for one export company only (Belayneh Kinde Import & Export Plc).
[101] Export of cereal grains in Ethiopia is still allowed under certain circumstances, for examples export of teff will only be allowed when milled or processed and originating from 48 selected farms; while export of maize, when exist, was allowed for agricultural unions and private investors who either own commercial farms or have agreements with farmers for the supply of the crops, and had obtained permits from the Ministry of Trade.

Table 14. Production Areas in East Africa

Production Zones	Volumes produced (MT)	% of National production*
TANZANIA	**Volumes (2019)**	**6,200,000 MT[102]**
Lake Zone - Kagera	353,400.00	5.7
Northern Zone		
Kilimanjaro	341,000.00	5.5
Manyarra	434,000.00	7.0
Southern Highland Zone		
Rukwe	539,400.00	8.7
Mbeya	694,400.00	11.2
Ruvuma	601,400.00	9.7
Iringa	706,800.00	11.4
Others	2,529,600.00	40.8
KENYA	**Volumes (2018) MT**	**4,439,889 MT[103]**
Trans Nzoia	533,816	12.02
Uasin Gishu	489,668	11.03
Bungoma	318,202	7.17
Nakuru	291,472	6.56
Narok	279,492	6.30
Kakamega	270,442	6.09
Kisii	162,324	3.66
Migori	133,126	3.00
Elgeyo Marakwet	114,595	2.58
Kericho	105,402	2.37
Kisumu	105,839	2.38
Machakos	103,974	2.34
Others	*1,531,537*	*34.49*
RWANDA	**Volumes (2019) MT**	**331,090 MT[104]**
Gatsibo	44,129	13.33
Nyagatare	40,036	12.09

[102] Respondent Interviews – Export Trading Group Tanzania
[103] https://www.kilimo.go.ke/dataset/
[104] National Institute of Statistics of Rwanda (NISR), Rwanda SAS 2019 Annual Report

Kirehe	26,693	8.06
Ngoma	24,484	7.39
Kayonza	18,533	5.60
Rwamaga	13,590	4.10
Gisagara	13,031	3.94
Gakenke	12,120	3.66
Gicumbi	11,955	3.61
Burera	11,933	3.60
Rutsiro	10,828	3.27
Rusizi	10,617	3.21
Others	*93,141*	*28.13*
UGANDA	**Volumes (2018) MT -** *Estimates*	**2,772,718 MT**[105]
***Eastern region*:** Jinja, Iganga, Kamuli, Mbale, Kapchorwa, Soroti *(major producer areas)*	1,301,236.55	46.93
***Central region*:** Mubende, Mityana, Kiboga Masindi, Hoima, Kibaale *(major producer areas)*	527,925.50	19.04
Northern region: Adjumani, Amuru, Apac, Arua, Dokolo, Gulu, Lira, Nebbi, Oyam, Pader, Yumbe *(major producer areas)*	358,789.70	12.94
South western region: Kyegegwa, Kamwenge, Kyenjojo, Kasese *(major producer areas)*	584,211.68	21.07
ETHIOPIA	**Volumes MT (2015)**	**6,100,000 MT**[106]
Amhara region *(East and West Gojjam as major producer areas)*	5,002,000	82%
Oromia region (East Showa)		
Gambella region (Jimma, East and West Welega)	1,098,000	18%
Southern Nations Nationalities and Peoples Region		

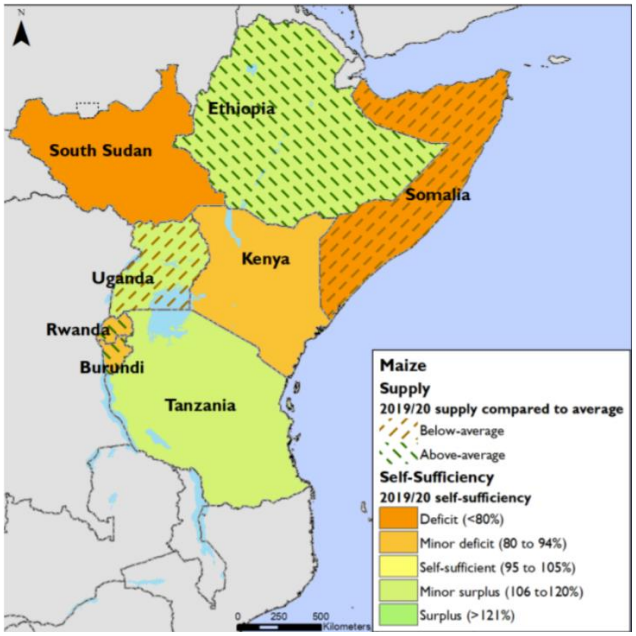
Note: The information listed is as per the latest data available for different countries.

There are pockets of maize surplus that have the potential to supply deficit areas in East Africa. While Tanzania has the most surplus areas, some regions such as Mwanza become deficient soon after harvest as most of the maize is sold at low prices. In addition to the deficit maize situation in East Africa, this region is also surrounded by countries that experience sporadic or chronic maize deficit situations (such as Malawi and South Sudan). Shortages can be averted if proper investments in storage facilities and the establishment of better management of grain reserves are made, both of

[105] Uganda Bureau of Statistics (2020), 2019 Statistical Abstract
[106] USDA 2015. Cited in Yami et al. Agricultural and Food Economics（2020）8:8 https://doi.org/10.1186/s40100-020-0153-5

which are crucial in shielding producers and consumers from price fluctuations. The Southern Highlands of Tanzania and North-Eastern parts of Rwanda, Western Rift Valley, as well as Eastern Uganda have the potential to supply deficit areas in East Africa.[107]

Figure 19 Projected 2019/2020 Maize Self-Sufficiency and Supply Levels compared to Average



Source: FEWS NET Estimates based on data from regional governments and multi-agency assessments.

Table 15 Key Consumption Patterns for Maize in East Africa

Country	Consumer Type	Consumption
Kenya	*National Cereals and Produce Board (NCPB)*	*25-30 percent of maize bought and sold later to individual consumers, schools, prison, and other institutions*
	Smallholder farmers	*Produce 70 percent of maize nationally and retain 58 percent of their harvest for home consumption*
	Urban Households	*20 percent of households that consume maize consider it as an inferior good*
	Animal Feed	*3 percent of white maize consumed*
Rwanda	*Small Maize producers*	*Consume 50-52 percent of maize produced*
	Consumers in Areas of production	*The main market for locally produced maize*
Tanzania	*Household Level in production areas*	*60-85 percent of maize produced*
	Maize deficient region and schools, hospitals, and prisons	*Consume the surplus levels of the production*
	Animal Feed Industry	*20 percent of maize*
Uganda	*20 percent of Population*	*Consume maize produced*
	Animal feed	*10-12 percent*

[107] Kilimo Trust (2017), ibid

Country	Consumer Type	Consumption
	Schools, Prisons, Hospitals	*Maize flour*

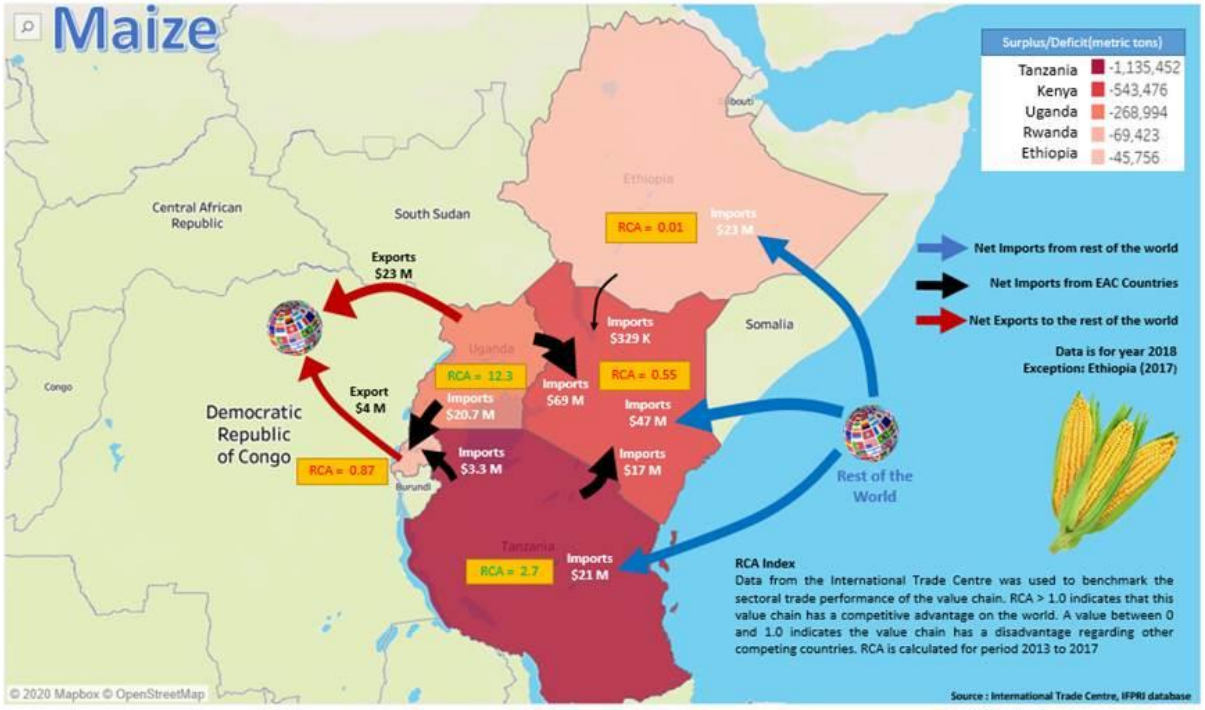
Source: Daly, et al (2016), FAO (2019) and Field Work, Kilimo Trust (2017), ibid.

Key regional competitiveness drivers and challenges

Geographic, environmental, social, and political characteristics are important contextual drivers of competitiveness in production. The East African region can plant and harvest twice a year which is the main advantage for farmers in Kenya, Rwanda, Tanzania, and Uganda. This is also a likely reason for lower seasonal variation in these countries.[108] Ethiopia, Tanzania, and Uganda have the lowest producer prices in the region.

Uganda and Tanzania are competitive in the maize trade, with an RCA of 12.3 and 2.7, respectively. Overall, all countries experience some degree of production deficit, with Tanzania having the highest level – over 1 million metric tonnes in deficit. As a result, Kenya, Ethiopia, and Tanzania resort to international markets to satisfy their demand, although some intra-regional trade also occurs. Smaller land-locked countries, such as Uganda and Rwanda, resort to regional markets to meet their demands.

Figure 20 Analysis of the competitiveness of EAC maize and movement across countries



Source: Analysis by International Economics Consulting Ltd.

The main challenges faced in the maize sector are summarised in Table 16.

[108] Kornher Lukas. 2018 Ibid

Table 16. Main challenges faced in the maize sector

Areas	Challenges faced
Production	• Inadequate supply of certified maize seeds suited to the different agro-ecological zones. • Reliance on rainfed agriculture and effects of drought on output. • The high price of inputs (improved seed, fertilizers). • Low productivity per acre (due to limited use of improved inputs (seed, agro-chemicals), erratic precipitation, and insufficient inputs. • Fragmented production units by smallholder farmers. • Limited production skills (particularly conservation agriculture). • Village cooperatives are not adequately organized to engage in production contracts. • Limited access to affordable credit streams. • High cost of inputs. • Insufficient knowledge on input use/application • Drought effects. • High incidence of crop pests and diseases. • Decreasing farm size[109].
Processing	• High power tariffs. • Lack of affordable and timely finance (cuts across the entire value chain). • Facilities operating at 30%110 utilization due to competition in grain trade for the regional market. • Insufficient grain drying and good storage capacity leading to high post-harvest losses on-farm and aggregation centres. • Underdeveloped backward and forward linkages111. • Limited investments in processing such as mills. • Poor maize quality due to poor postharvest handling practices.
Marketing	• Unstable prices. • Absence of a well-standardized method of product measurement in the market. • Lack of reliable and timely market information. • Inadequate access to credit facilities by grain traders. • Lack of storage and marketing facilities in both the surplus producing and the consumption centres. • Competition from small aggregators with access to farmers. • Inadequate bulking and storage facilities at border points and production areas. • Interference from politicians/governments. • Open border policy (unregulated markets). • The risk of export bans negatively affects the market. • Scarcity of adequate storage facilities in especially producer regions and aggregation points.

[109] Promar Consulting (2016). Promoting the Development of Food Value Chains in Africa-Kenya. Promar Consulting.
[110] Respondent interviews – The Grain Council of Uganda
[111] Daly J. etal 2016. Maize Value Chains in East Africa

Areas	Challenges faced
	• Low demand for high-value products.
Transport	• The poor state of rural roads (feeder roads) makes produce aggregation and farmers reaching centralized markets a challenge. • High transport costs in the region. • Corruption and bureaucracies in logistics (e.g. weighbridges inaccurate, unwarranted penalties by traffic police, etc).
Policy Gaps	• Maize export bans. • Failure to implement key policies e.g. Uganda's Grain Trade Policy and implementation strategy. • Maize standards and SPS regulations are not being enforced. • Non-enforcement of inflows of offshore grain (imported outside EAC) and not being levied the CET rates which makes maize uncompetitive. • Weak value chain coordination for aggregation and marketing. • Unregulated involvement of middlemen/brokers in the market chain.

Source: Field Work and references indicated

Value Chain Stakeholder Analysis

The value chain for maize is diverse across East Africa. In Ethiopia, maize production activity is performed by three types of actors: subsistence farmers, market-oriented smallholders, and commercial farmers. The first category includes mostly women producers, with an average land holding of less than 1 ha and limited application of technologies. Maize is mostly sold by this second group of actors – market-oriented smallholder farmers – with around 8 million smallholders who own relatively larger plots of land (2 to 5 ha on average) and account for roughly 40 percent of total production. In Kenya, the smallholder farmers constitute over 97 percent of all maize producers in the country, with a majority of them being in the Eastern, Rift Valley, Central, Nyanza, and Western provinces. Such farmers often intercrop maize with beans and peas. In Uganda, the production system is dominated by smallholder farmers, with 75 percent of the country's output grown on plots of land that are between 0.2 and 0.5 hectares.[112] With two separate growing seasons and vast stretches of fertile land, Uganda has some advantages over its regional peers in the production chains of maize. Cultivation is dispersed throughout the country, although the eastern region accounts for the highest share of output. Processing in the formal sector is concentrated in Kampala.

The value chain network functioning around smallholder farmers comprises linkages among input suppliers (private), farmers, co-operatives, extension service providers, credit service providers, and traders. Where co-operatives are well developed and organized, they tend to provide input supply and product marketing services to smallholders. Among these, only a few women are involved in cooperatives as well as input and extension service provision.[113]

The characteristics of the value chain in East Africa can be summarised as follows (Table 17).

[112] Daly, J., Hamrick, D., Gereffi, G. & Guinn, A., (2016). Maize Value Chains in East Africa. International Growth Center, F-38202-RWA-1.
[113] FAO (2019). National gender profile of agriculture and rural livelihoods – Ethiopia. Country Gender Assessment Series, Addis Ababa. 84 pp. Licence: CC BY-NC-SA 3.0 IGO

Table 17. Value chain actors of the maize value chain

Actors	Characteristics
Producers	• Production can be divided into three main groups: subsistence farmers, market-oriented smallholders, and commercial farmers. • The majority of producers consist of smallholder (subsistence) farmers with plots varying between 0.5 - 0.6 ha. • Market-oriented smallholders operate on areas between 2-4 hectares. • Commercial Farmers operate on a large scale and are also involved in seed production.
Wholesalers	• Generally, wholesalers play a significant role in supplying maize to both processors and retailers. They move to various maize-producing regions and predict volumes demanded by their market. They manage to get 70 percent of the stock required and face constraints such as limited supply and working capital. • In countries like Uganda given the value chain is not well integrated, a mix of village agents, traders, and wholesalers purchase maize from farmers and sell it to processors or retailers.
Processors	• Consist of two main groups which are the (i) small-medium scale processors who represent the majority of millers and (ii) large-scale millers who have a controlling stake, mainly in Kenya and Rwanda. • The processing capacity of maize millers varies between 47 percent (Rwanda) and 54 percent (Kenya) resulting in average utilization of only 55 percent of their installed storage capacity.
Grain Storage Facilities	• Despite East Africa having a considerable number of storage facilities set up by the governments and private sector, there is a need to invest in more storage facilities closer to production regions. • Private-owned storage which meets higher storage standards (such as the absence of contaminants) operate between 47-88 percent of their installed capacity. However, they suffer from pest infestation and lack of proper equipment, which results in grain losses of 10-60 percent.
Retailers	• Retailers handle small volumes of maize (just enough to avoid investing in storage facilities) and sell mainly to individual consumers.

Source: Daly, et al (2016), FAO (2019) and Field Work, Kilimo Trust (2017), ibid.

A list of stakeholders and contact details is presented in Annex 3.

Key findings on the value chain

Maize is a vital crop and an important source of food security for the majority of countries in East Africa. Despite the current deficit situation, the EAC region is endowed with a comparative advantage in the production of maize which can be channeled to cater for the demand in the region and external exports. The maize sector benefits from strong support by governments and has strong private sector-led institutions. The conditions for maize cultivation in the region are also favorable.

The maize sector, however, faces a number of challenges that affect its competitiveness. These are the sub-standard quality of maize in formal and informal markets, failure to implement government policies, low levels of compliance to standards (especially in Uganda) on maize exports across borders with no rewards for meeting these standards, weak level-playing platforms due to the existence of oligopolies controlling maize cross-border trade, and the existence of NTBs along the supply chain. Other problems related to this sector comprise low, unreliable, and scattered production which has an impact on the aggregation and transport costs, limited access to capital for all actors,

lack of storage facilities, information asymmetry about market opportunities, and inefficient milling technologies.

More specifically, there are a number of constraints that hinder the impact that maize can have in the communities:

- **Significant post-harvest losses.** This is mainly due to the shortage of high-quality storage facilities for both cereal inputs and outputs, poor agrarian practices, and weak disease control. In turn, these force the farmer to sell a large proportion of grain right after harvest, thereby minimizing their bargaining power.
- **Pervasive lack of trust in the maize value chain discouraging the use of cooperative and private storage facilities by producers.** Such lack of trust impedes the benefits of cooperatives functioning as aggregators and quality controllers, thus eroding their bigger bargaining power.
- **Overall, the non-respect of contractual terms among millers, cooperatives, farmers, and traders is a common phenomenon in the maize value chain.** This can be partially attributed to poor regulation and enforcement of quality and standards at the different nodes of the value chain, thereby refusing to enforce existing contracts.
- **Lack of access to quality seeds**, which leads to poor yields and substandard quality of maize on formal and informal markets.
- **Government interventions**, such as export bans, hamper the development of the sector at the national level.

The development of the maize value chain also faces a number of risks that threaten to compromise its expansion. Political instability, climate change, unpredictable trade environment (such as ad hoc export bans), limited investment in rural infrastructure especially roads and storage, and increased urbanization which is encroaching on agricultural land, represent some of the threats that could hold back the development of the sector.

Despite the above constraints, forecasted demand figures indicate that the market has the potential to expand in the East African region. The underutilized milling and storage signal the fact that many small and medium agribusinesses can be upgraded provide positive prospects for the sector's future. This will also provide opportunities for upscaling partner interventions in the maize sector especially for increasing production and dealing with NTBs.

Table 18. provides a summary of the prevailing policies related to the maize sector in East Africa:

Table 18. Policies related to the maize sector in East Africa

Countries	Policies
Ethiopia	**The Agricultural Transformation Agenda (ATA) Pulses and Cereals Integration Strategy**: Seeks to increase soil fertility and raise farmer incomes by improving land use. The strategy foresees cropping interventions in the Oromia, Amhara, Tigray, and SNNPR regions and its goal is to reach 121 *woredas* and close to 1 million farmers. **The National Strategic Plan on Food Security (1996)** aims at ensuring food security at the household level.
Kenya	**The National Cereals and Produce Board Act (Cap 338)** regulates and controls the marketing and processing of maize, wheat, and scheduled agricultural produce, and establishes a National Cereals and Produce Board. The board may direct that maize be sold or bartered by producers in such quantities and prices subject to certain conditions. This act empowers the Minister for Agriculture in consultation with the board to fix the prices of the agricultural produce. The Minister is empowered to export or authorize the exportation of maize. This act preserves and procures maize for the government's strategic grain reserves to sustain food security and national relief programmes.

Countries	Policies
	The **National cereals and Produce Board (NCPB)** established in 1985 by the Act of Parliament (Cap 338) as an agent of the Government for the procurement, management, and distribution of Strategic Food Reserves (SFR) and Famine Relief Stocks. NCPB also trades commercially in grains, provides grain post-harvest services, deals in fertilizer and other farm inputs like seeds, and offers clearing and forwarding services. **National Food and Nutrition Security Policy 2011 whose objectives are:** To achieve adequate nutrition for the optimum health of all Kenyans; to increase the quantity and quality of food available, accessible, and affordable to all Kenyans at all times; and to protect vulnerable populations using innovative and cost-effective safety nets linked to long-term development.
Rwanda	**Crop Intensification Program (CIP)** Started in 2007 and the goal is to increase agricultural productivity in high-potential food crops and to ensure food security and self-sufficiency through increasing access to productive inputs (fertilizers and seeds), improved water use (improvement of irrigation), and increasing the area under cultivation (marshland development). Maize, wheat, rice, Irish potato, bean, and cassava were identified as priority crops. The **National Agriculture Policy 2018,** amongst others, aims at Improved food security and nutrition; increased resilience and sustainability; and enhanced economic opportunities and prosperity. The **National Post-Harvest Strategy (2011)** has the following policy objectives: Strengthen food security among rural staple crop producers; improve consumer access to safe and affordable food; support the private sector to invest in strengthening the competitiveness of the staple crop value and supply chain; improve efficiency and decrease marketing costs along the staple crop value chain, and enhance producers' access to and linkages with markets.
Tanzania	**The National Food Reserve Agency (NFRA)** is mandated to store approximately 100,000 MT for strategic food reserves. Key functions of NFRA include: procure, reserve, and release food stocks to address disasters; recycle and release food stocks in the market to stabilize food supply, and; marketing food commodities and generating revenue (http://www.nfra.go.tz/).
Uganda	**The National Grain Trade Policy 2015. The objectives are to** improve the institutional, policy, and regulatory frameworks to enhance the competitiveness of the grain sub-sector; promote value addition and innovation; promote research, product development, and technology transfer; promote the development, harmonization, and enforcement of standards; promote the bulk handling and marketing of grains by farmers and traders through improved storage facilities and enhanced market infrastructure; enhance skilled human capacity development including women and youth to improve access to affordable credit.

The regional policies which impact the Maize sector are summarised below.

EAC Maize Standard	The East African Standard specifies requirements and methods of sampling and test for maize grains. The standard applies to maize (corn) for direct human consumption, i.e., ready for its intended use as human food, presented in packaged form, or sold loose from the package directly to the consumer. https://law.resource.org/pub/eac/ibr/eas.2.2011.html
EAC Common External Tariff (CET)	Maize imported into the EAC region is subjected to an Import Duty of 25% for grain, and 50% for other products. The EAC countries also require that all white maize imported into the region must be GMO-free.
EAC Protocol on Sanitary and Phytosanitary Measures	The objective is to promote within the community the implementation of principles of harmonization, equivalence regionalization, transparency, and risk assessment in the Agreement on the Application of Sanitary and Phytosanitary Measures; strengthen cooperation and coordination of sanitary and phytosanitary measures and activities at the national and regional level, based on understanding and application within the community and enhance the sanitary and phytosanitary status through science-based approach within the community.

COMESA Simplified Trade Regime (STR)	Common Market for Eastern and Southern Africa (COMESA) Simplified Trade Regime (STR) is a trade arrangement that allows cross-border traders in the COMESA region to enjoy duty-free status when they import goods originating from member states. STR is designed for small consignments that have a value of USD 2,000 or less and aims at simplifying and harmonizing customs and border procedures and improving the efficiency of border clearance processes for small-scale cross-border traders. Only Uganda, Kenya, and Rwanda have signed the COMESA STR, while Ethiopia has not. Tanzania is not part of COMESA.

Key findings on value chain

Overall, major constraints facing the bean sector are as follows:

Table 19. Challenges across the Beans value chain

Value Chain Steps	Challenges
Production	• Low access to and use of inputs (e.g., improved seed, agrochemicals, etc.), mainly for crops such as common beans and cowpea • Low productivity of beans varieties, mainly due to the low quality of seed available for the majority of beans smallholder farmers • Highly susceptibility to diseases such as rust, angular leaf spot, and anthracnose, which require fungicides for treatment. Beans are also affected by bacterial diseases like the common and halo bright, bean common mosaic virus, etc., which all require chemicals for treatment. Unfortunately, some farmers lack income for chemicals to control these diseases • Limited knowledge of new farming technologies that help to boost production, especially during drought situations. • Erratic supply of electricity affects irrigation for production[114] • Inadequate mechanization services lead to significant shortfalls in yields when planting is delayed • The difficulty of integration of beans smallholder farmers in the value chain limits the transmission of incentives to motivate farmers to invest in yield-enhancing technologies and management practices • Lack of private sector engagement in the value chain due to weak overall demand, which limits incentives for farmers and other value chain players to invest in productivity-enhancing inputs and practices • Difficulties in access to financial services (credit and agricultural insurance) to invest in businesses targeted to beans production and processing, as the interest rates are too high
Post-Harvest	• Limited availability of rural storage facilities increases post-harvest losses and reduce beans quality, mainly for cowpeas and common beans
Processing	• The predominance of small-scale processing and use of manual methods in some steps of beans processing, mainly for cowpea and common beans • Shortage of processing machinery manufacturers especially for the medium size units

[114] For example, farmers in the Kalumbila district of North-Western province of Malawi say that the shortage of electricity has affected production.

Value Chain Steps	Challenges
	• Difficulties in access to financial services (credit and agricultural insurance) to invest in businesses targeted to beans production and processing, as the interest rates are too high • Lack of electricity in the production zones limits the introduction of modern processing technologies to be used by small-scale processors
Aggregation, Assembling, and Marketing	• Weak market information systems (e.g. prices, product availability, the marketplace, etc.) within the chain • Poor quality of market infrastructure such as bad roads, affecting the connection between beans production and consumption zones • High transport cost due to bad road conditions • Absence of updated national food laws, standards, and specifications for food products and quality control

Source: Author's compilation, based on Katungi et al (2017), USAID (2016). Birachi (2012), and information from fieldwork.

Recommendations

Based on the above considerations and analysis of the situation, recommendations specific to the maize value chain in East Africa are shown in the table below.

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Promote commercial farming and good production practices to reduce post-harvest loss and lower production costs. Provide capacity building for farmer groups to run as business entities concentrating on collective bulking, business and management, governance, and entrepreneurial skills. Encourage financial institutions to provide tailored financing solutions to smallholder Producers and traders	Enhanced access to production inputs (including capital) contributing to higher productivity and production	Producers	Medium	Medium	Low	Medium	Ministries/ Depts of AgricultureFAO, IFAD, USAID, UKAID, BMGF, Afreximbank
Provide capacity building for proper post-harvest handling (GAP, GHP) especially at the farmer level, and generally for actors along the supply chain to meet East African Standards on product quality.	Improved quality of products to match market demands and potential exports	Producers, Processors	High	High	Low	Short/ Medium	Ministries/ Depts of AgricultureFAO, IFAD, USAID, UKAID, BMGF

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Time***	Potential Partners
Increase certification capacity at the production and aggregation segments of the chain. Focus on GMP certification for processors.							
Invest in the establishment of smaller storage facilities (<300MT) closer to producer regions potentially managed by cooperatives	Reduced post-harvest loss and improved quantity and quality of produce	Processors, Traders	High	High	High	Medium	Ministries/ Depts of AgricultureFAO, IFAD, USAID, UKAID, BMGF, Afreximbank, Private Sector
Promote platforms for up-to-date information sharing, e.g. national and regional commodity exchanges, for timely and accurate information dissemination and sharing	Better integrated value chain; Enhanced market linkages and information to allow all actors to actively participate in the value chains	Producers, Traders	High	Medium	Low	Short	Ministries/ Depts of AgricultureFAO, IFAD, USAID, UKAID, BMGF, Private Sector
Capacity building (human resource and infrastructure) of the institutions mandated to enforce policies, especially related to standards and NTBs	Improved implementation and enforcement of policies especially standards and NTBs to support intra-regional trade	Traders	High	Medium	Low	Short	Ministries/ Depts of Agriculture FAO, IFAD, USAID, UKAID, BMGF

**For Regional Food Trade; ** Investment level: Low (0-5 million); Medium (5-15 million); High (>15 million); ***Timeline (Short 0-2 years, Medium 3-5, Long 5+). Notes: BMGF = Bill & Melinda Gates Foundation. Source: Author's compilation*

Potential partnerships in the Maize sector

SilverStreet Capital is an investment company which invests in the agricultural sector in Africa. The areas they are involved in include maize and soya (mainly seed crops) but also poultry and cattle. They are currently working through the contractual farming model especially with smaller farmers. Given the success of this model, they indicated their interest in partnering with AGRA in developing similar projects in countries where AGRA is involved.

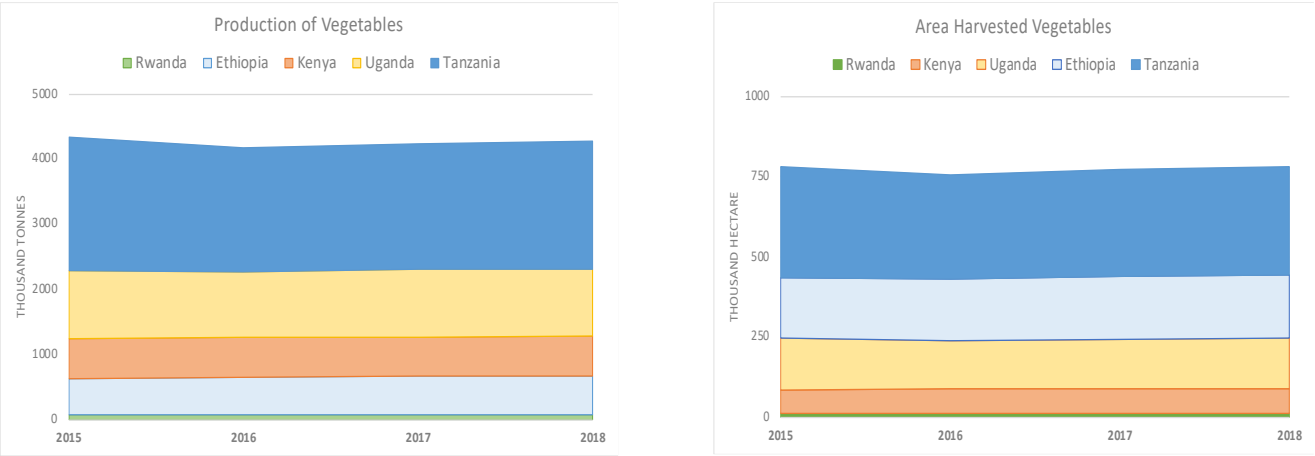
9. Vegetable Value Chain[115]

Key consumption, production, and trade trends

East Africa's market for vegetables is booming. The sector, which has become an important source of livelihood in rural areas, represents one of the best food options for achieving increased food self-sufficiency, food security, improved nutrition, foreign exchange earnings, and ensuring the generation of increased incomes and employment.[116] Diversifying and increasing horticultural production will help farmers to overcome malnutrition and poverty by augmenting household consumption and also create new market opportunities for smallholders. Moreover, vegetable value chains can offer new income and employment opportunities in the trading and processing sectors.[117][118]

Horticulture is both a cash and staple crop.[119] In Kenya, horticulture contributes one-third of the country's agriculture GDP. The total value of horticultural production reached USD 1.4 billion in 2017, of which USD 1.1 billion was exported, representing a 13.6 percent increase in comparison to the previous year.[120] The sector represents the third major source of foreign exchange, after tourism and tea.[121] In Uganda, the horticulture sub-sector contributes 14.4 percent of the national GDP. Vegetables account for the largest percentage of horticulture exports in Tanzania. The horticulture industry is dominated by small-scale farmers and mainly vegetable producers, who account for almost 70 percent of vegetable produce. The industry has less than 40 large-scale growers/exporters (off-takers) with the majority of them located in the northern Tanzania region (Arusha and Manyara). Tanzania is among the world's top 20 producers of fresh vegetables.[122]

Figure 21 Production of vegetables (left) and area harvested for vegetables (right)



Source: FAOStat

East Africa is a big supplier of vegetables to Africa. 20 percent of all production of fresh vegetables in Africa originates from Ethiopia, Kenya, Rwanda, Uganda, and Tanzania. The productivity and cultivation area of fresh vegetables has remained constant in the region during the 2015-2018 period,

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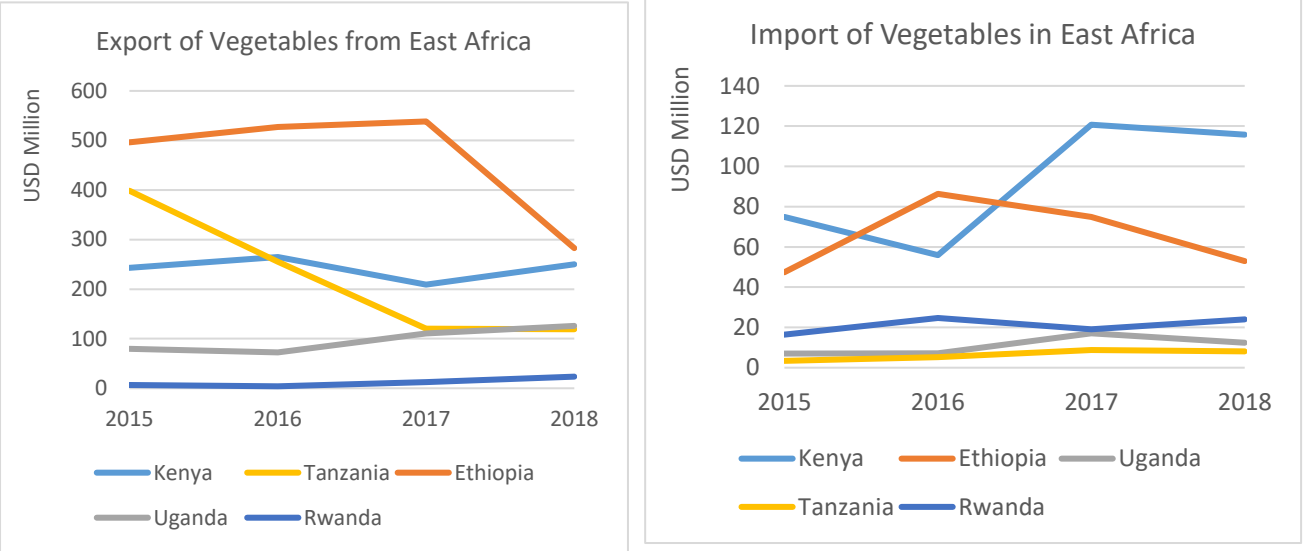
[115] Vegetables considered are from HS code 6 to 14
[116] Matchmaker Associates (2017a). Horticulture study Phase 1: Mapping of production of fruits and vegetables in Kenya. Kingdom of the Netherlands, March.
[117] Teshome, A., & Jochen, D. (2016). Horticulture value chains in Ethiopia: Opportunities for better nutrition and new market access? Available at http://www.tropentag.de/2016/abstracts/full/309.pdf
[118] For an overview of existing market information systems, see Annex 4.
[119] Both Vegetables and Fruits
[120] Fintrac Inc. (2012). Global Competitiveness Study: Benchmarking Kenya's Horticulture Sector for Enhanced Export Competitiveness. USAID, Kenya Horticulture Competitiveness Project.
[121] WTO (2019). Trade Policy Review – Kenya. World Trade Organisation, WT/TPR/S/384, Geneva.
[122] According to FAOSTAT.

with productivity being around 30 tonnes per hectare per year over a total harvested area of 780 thousand hectares.

Figure 22. Import and Export of Vegetables to East Africa



Source: ITC TradeMap

East Africa's trade in vegetables is strong, but it has shown some declines. Imports of vegetables in East Africa increased from USD 149 million in 2015 to USD 213 million in 2018. On the other hand, exports from East Africa have shown a declining trend, falling from USD 1.2 billion in 2010 to USD 801 million in 2018. This decline was mainly attributed to the shrinking exports of Ethiopia, which fell from USD 538 million to USD 283 million from 2017 to 2018. This was mainly caused by the droughts of 2017 and 2018.[123] In addition, the increasing tariffs, the incidence of non-tariff measures, and increasing Sanitary and Phytosanitary (SPS) requirements in major target markets such as the U.S. and the EU are behind the declining exports of East African vegetables over the years.[124]

Ethiopia and Kenya the region's key exporters of vegetables. In just ten years, Ethiopia's exports of vegetables rocketed from USD 74 million in 2007 to USD 538 million in 2017. In 2018, Kenya's total exports of vegetables reached USD 250 million, a 19.7 percent increase in comparison to the previous year. Between 2001 and 2018, the sub-sector experienced a CAGR of over 4 percent. The EU has been the main driver of Kenya's boost in the export of vegetables, having absorbed between 80 and 90 percent of the country's total exports of vegetables.

Tanzania and Uganda, however, have an insignificant level of exports of vegetables despite their large production. In Tanzania, this is mainly due to the current business arrangements that include Tanzanian export companies as subsidiaries of Kenyan conglomerates, and these exports are not recorded in Tanzania's export data and fail to show Tanzania's actual position in the export market.[125] Also, a majority of the small-scale farmers have limited chances to conduct export business themselves, mostly because they are poorly connected to the regional and international markets. Producers have now started to form groups to produce as contract farmers or out-growers to these large export firms based out of Kenya. In Uganda, the producers lack appropriate infrastructure for

[123] O. Anyadike (2019). Drought in Africa leaves 45 million in need across 14 countries, The New Humanitarian. June 2019. Available at: https://www.thenewhumanitarian.org/analysis/2019/06/10/drought-africa-2019-45-million-in-need
[124] O. I. Kareem (2019). Border Measures and Africa's Agri-Food Trade: Export Markets Comparative Analysis, Trade and Development Policy research network. WTO Agricultural Symposium, June 2019. Available at: https://www.wto.org/english/tratop_e/agric_e/s2_4_olayinka_idowu_kareem_symposium_presentation_27062019_pm.pdf
[125] Matchmaker Associates (2017b). Synthesis Report - Horticultural Tanzania & Kenya.

marketing and post-harvest handling, considering the highly perishable nature of vegetables. Also, Uganda's horticultural exports, especially to the EU, have encountered numerous challenges as a result of harmful organisms and high levels of pesticide residues, due to a breakdown in the quality assurance system at all levels of the horticulture value chain in the country.

Overall, the top five destinations for East African exports are the United Kingdom (UK), India, Kenya, Somalia, and Pakistan. In 2018, the UK imported USD 121 million worth of vegetables, followed by Kenya and India, with imports worth USD 94 million and USD 91 million respectively. In previous years, India was the largest export destination for East African vegetables with exports as high as USD 295 million.

In 2018, vegetables traded within the East African region consisted mainly of dried vegetables, potatoes, roots and tubers, leguminous vegetables, tomatoes, carrots, and onions. Dried vegetables were the most popular with exports worth USD 6.1 million. Amongst fresh vegetables, potatoes worth USD 5.2 million were exported and absorbed within the region, followed by roots and tubers worth USD 3.8 million, in 2018. Overall, there has been an increase in the export of vegetables, destined for countries within the East African region.

Table 20. Top vegetable exports within EAC

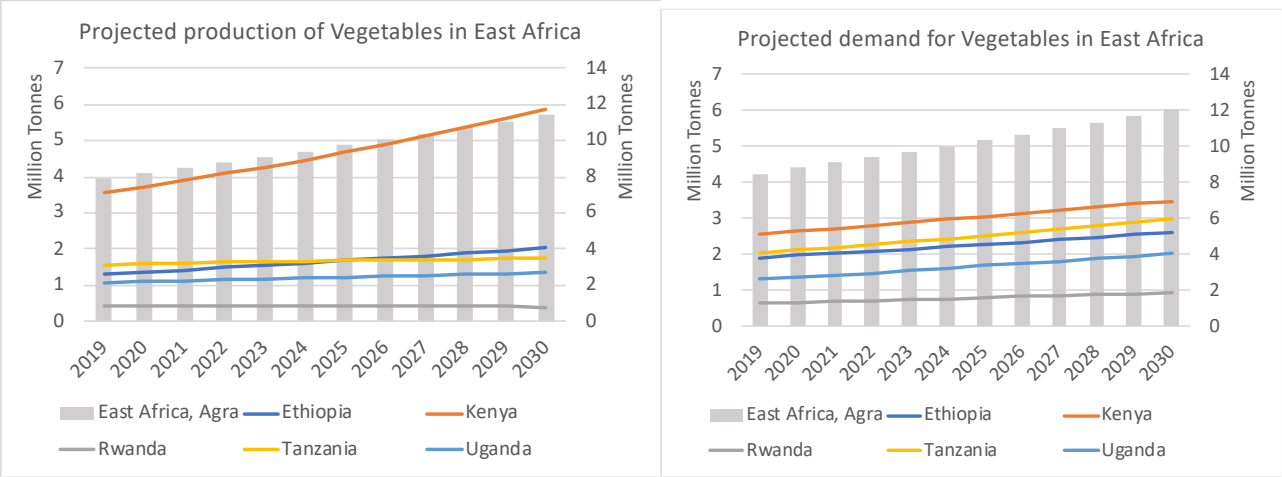
HS Code	Product Label	Exported Value (USD Millions)			
		2015	2016	2017	2018
'0712	Dried vegetables, whole, cut, sliced, broken, or in powder, but not further prepared	1.4	2.4	4.3	6.1
'0701	Potatoes, fresh or chilled	4.6	6.7	14.3	5.2
'0714	Roots and tubers of manioc, arrowroot, salep, Jerusalem artichokes, sweet potatoes, and similar ...	2.2	2.5	5.3	3.8
'0708	Leguminous vegetables, shelled or unshelled, fresh or chilled	3.2	4.2	11.1	3.4
'0702	Tomatoes, fresh or chilled	0.2	2.4	3.9	2.8
'0706	Carrots, turnips, salad beetroot, salsify, celeriac, radishes and similar edible roots, fresh ...	1.2	1.1	2.0	2.7
'0709	Other vegetables, fresh or chilled (excluding potatoes, tomatoes, alliaceous vegetables, edible ...	0.3	0.2	0.4	2.0
'0703	Onions, shallots, garlic, leeks, and other alliaceous vegetables, fresh or chilled	0.7	0.3	1.1	0.5

Source: ITC Trademap

Among all five studied countries, only the local production of vegetables in Kenya is expected to be at a surplus. In Kenya, production is projected to rise to nearly 6 million tonnes whereas demand is expected to increase to 3.5 million tonnes in 2030. The surplus of 2.5 million tonnes can be exported.

In the other four East African countries, a deficit for vegetables is expected. Cumulative demand in Ethiopia, Rwanda, Tanzania, and Uganda is expected to reach 8.5 million tonnes whereas cumulative production will be at a deficit of around 5.5 million tonnes.

Figure 23 Production vs Demand for Vegetables in East Africa



Source: IFPRI

Key regional competitiveness drivers and challenges

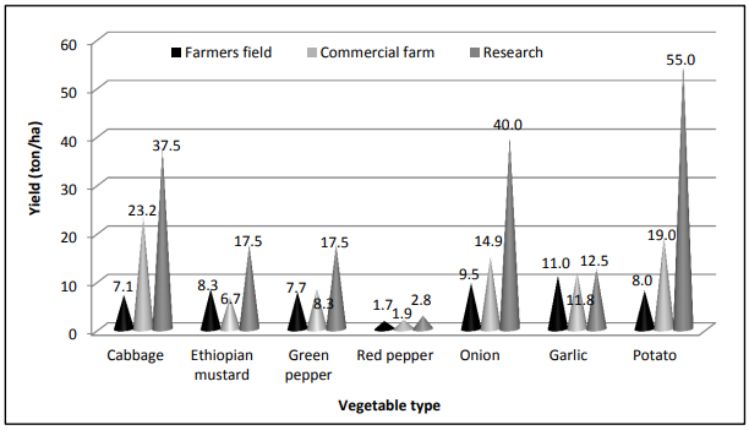
The region's competitiveness in the production of vegetables is high. The advantages lie in its favorable climate, proximity to European and Middle Eastern markets and abundant and cheap labor, the size of its domestic market, and the numerous river basins affording the great potential for irrigation and hydropower generation.[126] Additionally, the sector is supported by multiple national governments: Ethiopia launched its Growth and Transformation Plan (GTP), Tanzania introduced its Horticultural Development Strategy, Kenya established its National Horticulture Policy in 2012.[127] As highlighted by JICA (2017), "[as] *the global middle class grows, its demand for higher quality and more-diverse food increases. Increased consumption of fruits and vegetables can be attributed to more households becoming health conscious. [..] industry operators have increased their output to meet this growth in global demand. Considering this scenario, processed fruits and vegetables can be a Key Growth Driver in Kenya."* This can also apply to the rest of East Africa.

Overall, the production of vegetables varies from smallholder farming for home consumption to large-scale commercial state and private farms solely serving the market. Increasing awareness of the nutritional and health benefits of vegetables combined with rising prices of livestock products have propelled the role of vegetables in fighting hunger and malnutrition in the region.

However, production is still below its potential. The productivity of crops is very low compared to the potential yield obtained in the research centres and on farmers' field technology verification studies. The latter could be five times higher than the former.[128]

[126] Ashebre, KM. (2015). Opportunities and Potential in Ethiopia for Production of Fruits and Vegetables: A Graduate Senior Seminar Paper. African Journal of Basic & Applied Sciences 7 (6): 328-336, 2015.
[127] Reddy, R., & Kanna, N. (2016). Value Chain and Market Analysis of Vegetables in Ethiopia – A Review. International Journal of Economics and Business Management, 2016, 2(1),90-99.
[128] *Ibid*

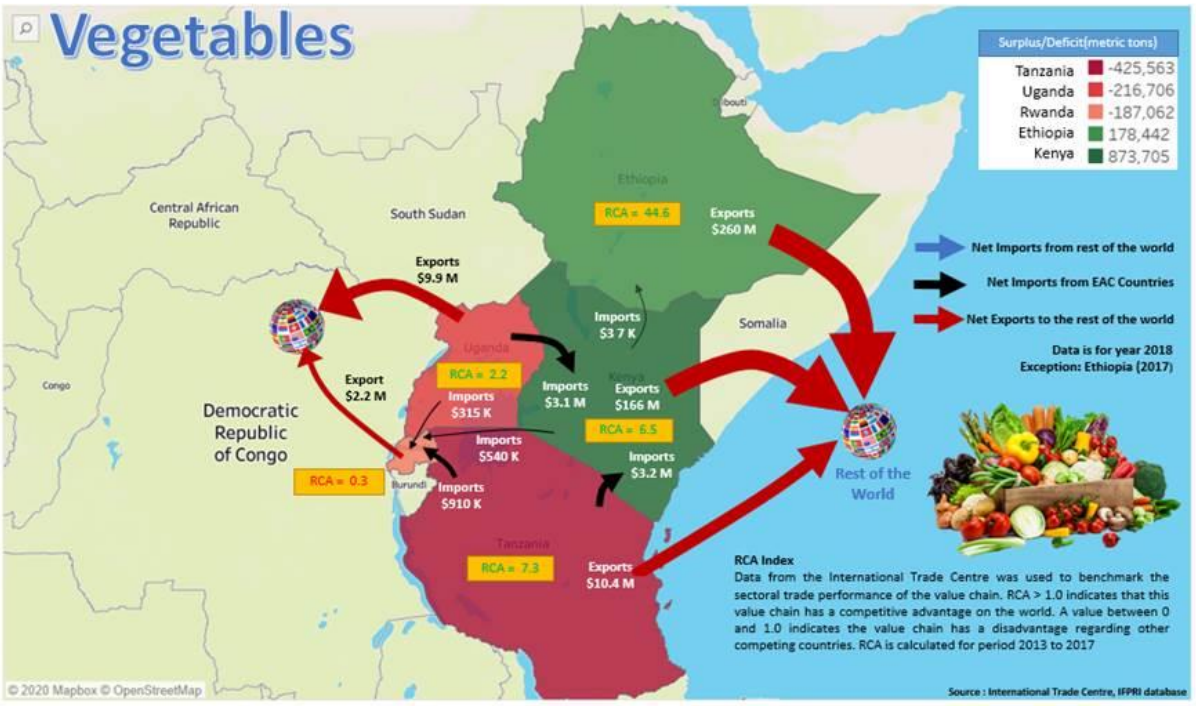
Figure 24. Productivity of some vegetables under farmers, commercial, and research fields



Source: Emana et al. (2015)129

Except for Rwanda, where the production of vegetables is limited, East Africa is very competitive in the vegetable trade. The RCA ranges from 2.2 (Uganda) to 44.6 (Ethiopia). Internal demand is reduced, as reflected by the significant production surplus of Ethiopia and Kenya. Most of the production is destined for exports to the Rest of the World. In Tanzania, despite the internal deficit, the export market seems more attractive for producers, who prefer to supply foreign demand.

Figure 25. Analysis of the competitiveness of EAC vegetables and movement across countries



Source: Analysis by International Economics Consulting Ltd.

[129] Emana, B.; Afari-Sefa, V.; Dinssa, F.F.; Ayana, A.; Balemi, T. and Temesgen, M. (2015). Characterization and Assessment of Vegetable Production and Marketing Systems in the Humid Tropics of Ethiopia. Quarterly Journal of International Agriculture 54 (2015), No. 2; DLG-Verlag Frankfurt/M.

Value Chain Stakeholder Analysis

The production of vegetables in East Africa has been established for years, and the value chain is varied and diverse. The value chain comprises large state farms supplying fruits and vegetables to the numerous small producers growing a small range of vegetables, both for the local and regional markets.[130]

In Tanzania and Uganda, the vegetable supply chains are mainly informal with farmers isolated from the majority of end-consumers, thus giving them little control over input costs or the price received for their goods.

In Uganda, these supply chains are determined by the existing different farm types; subsistence farmers, small-scale commercial farmers, and large-scale commercial farmers and their markets. The subsistence farmers have the shortest supply chain, with just the farmer and the buyer. For the main urban and regional markets, locally based traders will collect vegetables from small-scale commercial farms and distribute them to other market intermediaries.[131]

In Tanzania, traders buy goods from farmers and sell them to the village markets, supermarkets in urban areas, regional markets, national markets, and export markets. Middlemen link farmers and traders, providing a source of market and price information. The trader connects to the general market and then a broker further links the general market with restaurants and hotels that ultimately reach the tourists.[132] Table 21 highlights the key players in the Tanzanian horticultural value chain:

Table 21 Main stakeholders in Horticultural value chains in Tanzania

Stakeholders	Description
Primary actors	
Input Suppliers	**Input suppliers** like By-Trade, Yara, Minjingu, and Balton are important partners for the horticulture farmers as they provide a range of pesticides, fungicides, and fertilizers necessary to cope with increasing demand among horticulture farmers. The agro-dealers located in rural areas close to farmers are stocking inputs that farmers often demand.
Producers	**Small scale farmers** are those having plot sizes that are below 2 acres. They practice a mix of commercial and subsistence production. They are dominant in agri-production, especially in vegetable production, where they account for 70 percent of vegetable producers. **Large-scale farmers** are those having farms of at least 12 hectares. Tanzania's horticulture industry has less than 30 large-scale growers, the majority of them located in northern Tanzania (Arusha and Manyara).
Horticultural Association	The Tanzanian Horticultural Association (TAHA) is an apex private sector member-based organization that facilitates the development and inclusive growth of the horticultural industry in Tanzania. It aims to promote and develop the horticulture sector, while addressing the general and specific needs of its members.
Marketing	The off-take model operates through a contract farming system where private organizations enter into a contract with farmer associations or groups. The key players in the HomeVeg Business Model include Private Organizations like HomeVeg itself, small-scale producers, Input Suppliers, and Service Providers, Transporters, Exporters, Airport Authorities, and Clients (in the export market).

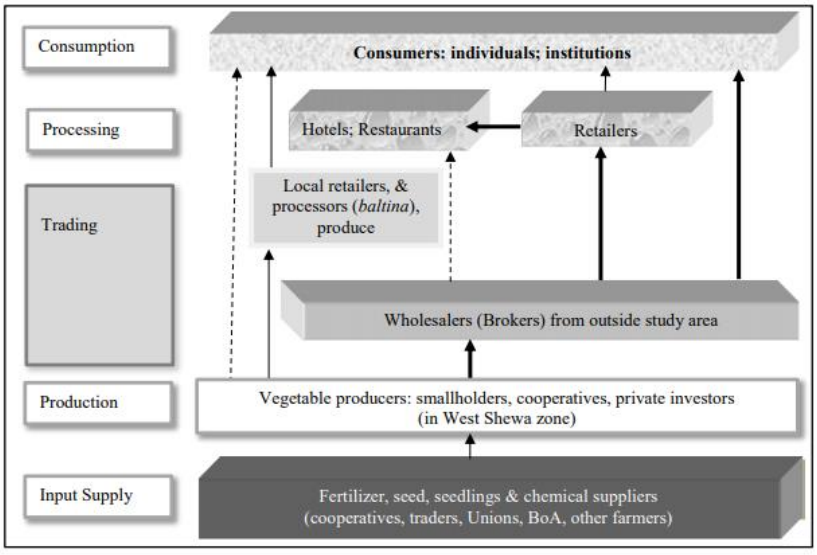
[130] Hunder, NF. (2017). Opportunity, Problems and Production Status of Vegetables in Ethiopia: A Review.
[131] Olga van der Valk (2005). Partnership for Market Access; towards a sustainable market-oriented horticultural sector in Uganda.
[132] VSO (2015). Value Chain Analysis of the fruit and vegetable market for smallholder farmers in Zanzibar. Available at: https://www.vsointernational.org/sites/default/files/VSO%20Value%20Chain%20Analysis%20CASH.pdf

Stakeholders	Description
	Through contract farming, HomeVeg promotes and helps small-scale producers to form groups where group members are initially trained vigorously on group dynamics, farming techniques, and extension services.
Transportation	The TAHA Fresh Logistics Company is a liability partnership between the Tanzania Horticulture Association and some of the top horticulture producers and exporters in Tanzania. Established in 2008 by TAHA and funded by USAID, it provides logistical services to the horticultural industry in Tanzania.
Value Chain Enablers	
Research Institutes	The Sokoine University of Agriculture (SUA), the World Vegetable Centre, the Horticultural Tengeru Institute, the Selian Agricultural Research Institute, and the Mikocheni Research Institute are among the institutes that support the horticultural producers and processors with research-related services for their compliance to standards.
Government Departments and Agencies	Responsible ministries and government agencies include; The Ministry of Agriculture Livestock and Fisheries (MALF), Ministry of Transport, Ministry of Industry and Trade (MIT), Tanzania Revenue Authority (TRA), Tanzania Airport Authority (TAA), Energy and Water Regulatory Authority (EWURA), Tanzania Port Authority (TPA), Tanzania Civil Aviation Authority (TCAA), Local Government Authorities (LGAs), Tanzania Pesticide Regulatory Authorities (TPRA), Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA). The standards-related matters for processed products are taken care of by the Tanzania Bureau of Standards (TBS) and the Tanzania Food and Drugs Authority (TFDA).

Source: Matchmaker Associates (2017b)

Ethiopia and Kenya follow a similar value chain for vegetables. The main market actors of vegetable production include producers/farmers, wholesalers, retailers, and consumers. The majority of the vegetables' production is by small and medium farmers, who grow one or two crops as primary cash crops. The next step in the value chain are traders, brokers, and wholesale traders. The major channel is where producers sell vegetables especially to wholesalers, who then resell to retailers and consumers (Figure 26).

Figure 26. Vegetables value chain in Ethiopia



Source: Emana et al. (2015)

A list of stakeholders and contact details is presented in Annex 3.

Key findings on value chain

Despite the existing potential for trade and food security, there are a number of constraints that hinder the growth of the vegetable value chain:[133]

Lack of appropriate infrastructure for marketing and post-harvest handling, such as cold chain, cold storage in markets, warehousing, etc., leads to high post-harvest losses. It also leads to significant market price fluctuations. The majority of the traders lack formal offices, and the low levels of membership in associations imply a low level of cooperation and coordination amongst them. This situation is also showcased by the fact that traders do not combine truck shipments. At the wholesale markets, traders usually lack storage space – only 15 percent of the traders have storage separate or near the market, especially cold storage, which forces them to sell all their stock within one day causing market price volatility.

Lack of information and storage hampers the producers' ability to set their desired price. The majority of the vegetables' production is by small and medium farmers, who grow one or two crops as primary cash crops. These, generally, have limited access to price information, consumer preferences, and lack of on-farm storage facilities, which give them no bargaining power against buyers, as they do not know the market prices and have to sell their products almost immediately. Additionally, producers are usually dependent on the traders for transport and selling price, which positions traders in a privileged position. For example, in Tanzania, farmers are isolated from end-consumers with respect to prices and, therefore, depend on umbrella farmer organizations that are working to establish alternative routes to market for farmers by facilitating direct access to the general market. The majority of the small-scale farmers do not have chances to conduct export business mostly as they are poorly connected to the regional and international markets.

Most of the traders do not own trucks, and instead, have to rent from transporters. This last group suffers from an excessive number of police checkpoints and roadblocks along trade routes, extortion from the police (though this is improving), and inadequate parking space and congestion in the markets.

A set of institutional constraints affect the region's vegetable production. Those include lack of access to improved, pest and disease-resistant, varieties, lack of a functional vegetable seed certification/regulatory systems, ultimately resulting in the use of uncertified poor-quality seeds by farmers, the fragmented nature of vegetable farms obstructing the establishment of coordinated market linkages, and lack of policy initiatives to address the issue. For example, lack of pest management control has hampered Uganda's horticultural exports, especially to the EU. A breakdown in the quality assurance system at all levels of the horticulture value chain in the country has also resulted in harmful organisms and high levels of pesticide residues, thus affecting exports.

National Policies relating to the horticultural sector

Tanzania Horticultural Development Strategy (2012- 2021)

The strategy gives a roadmap for transforming the horticulture sector in Tanzania through achieving the seven pillars of its strategic initiatives that include: the promotion of horticulture; strengthening industry linkages and mobilizing human resources; addressing land, policy, and infrastructure bottlenecks, expanding long-term financing and investment, and expanding the production baseb by directly addressing the constraints in the horticulture industry and expanding the market for horticulture in Tanzania.

[133] According to Hunder, NF. (2017), *ibid*; Ashebre, KM. (2015), *ibid*; VSO (2015). Value Chain Analysis of the fruit and vegetable market for smallholder farmers in Zanzibar.

Kenya National Horticulture Policy (2012)

This policy aims to accelerate and sustain the growth and development of the horticultural industry in Kenya through specific strategic interventions in areas of agricultural inputs, crop management practices, planting material, urban and peri-urban agriculture, etc. Under this policy, the Government will:

- establish special horticultural economic zones and provide incentives for investment;
- enhance compliance with standards and product safety through sensitization;
- promote the use of integrated pest and disease management;
- enhance the capacity of researchers and other stakeholders to match the changing industry needs; and
- continue, in collaboration with the private sector, to undertake measures that will make inputs more accessible to farmers.

Uganda "Enhancing the Capacity of Uganda's Fruit and Vegetable Sector to Comply with Phytosanitary Requirements" project 2018-2022

The project aims to improve the market access of fresh fruits and vegetables (FFV) from Uganda to the EU, as well as other high-end and regional markets for the country's FFVs, with its key purpose being to improve compliance with international phytosanitary standards for production and export. Some of the outcomes of the project are:

- Diagnostic mapping of partners and the formation of a multi-stakeholder platform, identifying priority areas for capacity building and input on inspection and certification.
- A capacity development plan to include the training of inspectors, farm scouts, farmers, transporters, and traders on pest management, conducting inspections, and managing pack houses.
- A specific phytosanitary survey and monitoring system will be developed and made operational in the country.
- A marketing strategy on exporting Uganda FFVs to increase exportation to new and existing markets.
- Awareness and support of project systems and outputs for inspection and certification will be raised.
- Streamlining the inspection and certification system based on public-private partnerships.

Recommendations

Based on the above considerations and analysis of the situation, recommendations specific to the vegetable value chain in East Africa is shown in the table below.

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Timeline***	Potential Partners
Establish input and extension services clusters/centres to distribute production inputs (certified seeds, pesticides, and fertilizers), cultivation good practices, and agricultural technologies (crop rotation, sanitation, crop/residue destruction, pest control, post-harvest handling, etc.)	Improved quantity and quality of production	Producers	Medium	High	Low	Short	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF
Establish producer associations and other formal institutions. Introduce schemes to extend production support and credit facilities for producers to acquire production equipment (e.g., tools, irrigation equipment, storage facilities, etc.)	Strengthen market power and product knowledge base for the producers; Improved quantity and quality of production	Producers	Medium	Medium	Low	Medium	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF
Provide market research, training, and extension service system to facilitate new growth opportunities for the vegetable sector. Develop new or promote the use of existing market information systems to improve the information flows among value chain actors	Remote and rural producers have access to market and other production-related information to better planning of production and mitigation measures and efficient participation in the value chains	Producers collectors, wholesaler, retailers	High	Medium	Low	Short	Ministries/ Departments of Agriculture, FAO, IFAD, USAID, UKAID, BMGF, Private Sector
Raising awareness and training on the adoption of Good	Improved quality of products to	Producers,	High	High	Medium	Medium	Ministries/ Departments of Agriculture,

Recommended Interventions	Expected outputs	Potential Targets in the VC	Priority Level *	Impact *	Investment Level**	Timeline***	Potential Partners
Agricultural Practices (GAP) and Good Handling Practices (GHP) in the production and processing of vegetable products	match market demands and potential exports	Processors					FAO, IFAD, USAID, UKAID, BMGF
Improve the logistics infrastructures (rural electrification, rural road network). Provide incentives for the private sector to provide co-funding for infrastructural improvements that directly enhance value chain efficiency (e.g. storage facilities, cold chain, transportation facilities, etc.)	Reduced post-harvest loss and loss incurred along the value chain, thus reducing overall costs; Enhanced linkage from producers to end-consumers	Producers, Collectors, Wholesalers, Retailers	High	High	(Very) High	Long	Ministries/ Departments of Agriculture, World Bank, IFC, IFAD, Private Sector

**For Regional Food Trade; ** Investment level: Low (0-5 million); Medium (5-15 million); High (>15 million); ***Timeline (Short 0-2 years, Medium 3-5, Long 5+). Notes: BMGF = Bill & Melinda Gates Foundation.*

Source: Author's compilation

References

Afun-Ogidan Dolly, van Seters Jeske, and Rampa Francesco (2012). Regional approaches to food security in Africa, ECDPM Discussion Paper n° 128c

Afun-Ogidan, D. (2012). Regional integration for food security in East Africa: the role of CAADP. GREAT Insights, Volume 1, Issue 4. June 2012. Maastricht: ECDPM.

AGP-LMDP (2013). Value chain analysis for Ethiopia: meat and lives animals; hides, skin and leather; dairy. Agricultural Growth Project – Livestock Market Development Programme. Available at https://www.usaid.gov/sites/default/files/documents/1860/AGPLMD%20Value%20Chain%20Analysis.pdf

AGRA (2013). Establishing the Status of Post-Harvest Losses and Storage for Major Staple Crops in Eleven African Countries (Phase I), Alliance for a Green Revolution in Africa, Nairobi.

Allen, S. (2012). Food security in East Africa from a trade facilitation perspective. GREAT Insights, Volume 1, Issue 7. September 2012. Maasttricht: ECDPM

Ashebre, KM. (2015). Opportunities and Potential in Ethiopia for Production of Fruits and Vegetables: A Graduate Senior Seminar Paper. African Journal of Basic & Applied Sciences 7 (6): 328-336, 2015.

Assefa, Y. (2018). Africa Trading: Five Takeaways on Trade-Based Solutions for Food Security. DAI.

Ayalew, W (2006). Getting the incentives right: concerns associated with expansion of cattle export markets in Ethiopia. Ethiopian Journal of Animal Production 6(2):99-103.

Bizimana, J.; Bessler, D. A.; & Angerer, J. P. (2013). Impact of Market Information System (E-Soko) on Beans Markets Integration: Case of Rwanda.

CASA (2020). Beans Sector Strategy – Uganda. Casa Uganda Country Team. Available at https://www.casaprogramme.com/wp-content/uploads/CASA-Uganda-BeansSector-analysis-report.pdf

CGIAR (2015). Technical report: Structure of the Cooking Banana Value Chain in Uganda and Opportunities for Value Addition and Postharvest Losses Reduction. Expanding Utilization of Roots, Tubers and Bananas and Reducing Their Postharvest Losses. Available at https://www.rtb.cgiar.org/wp-content/uploads/2015/08/RPS/2/3.pdf

CTA (2017). Mapping Livestock Value Chains in the IGAD Region.

Daly, J., Hamrick, D., Gereffi, G. & Guinn, A., (2016). Maize Value Chains in East Africa. International Growth Center, F-38202-RWA-1.

Deloitte (2019). Africa Construction Trends Report 2019. Available at https://www2.deloitte.com/za/en/pages/energy-and-resources/articles/africa-construction-trends.html

E. Birachi (2012). Value chain analysis of beans in eastern and southern Africa: Building partnerships for impact through research on sustainable intensification of farming systems. CIAT. November, 2012. Available at: https://core.ac.uk/download/pdf/132642347.pdf

EAC (undated). Constraints and challenges of the EAC Agriculture sector. https://www.eac.int/agriculture/livestock-and-fisheries.

EAFF (2012). Eastern Africa Livestock Strategy. Eastern Africa Farmers Federation.

Eastern Africa Farmers Federation (EAFF) (2012). Eastern Africa Livestock Strategy, August 2012.

ECDPM (2017). Fabien Tondel, Understanding the political economy of the EAC in the agricultural sector Private sector ambitions facing political headwinds.

Emana, B.; Afari-Sefa, V.; Dinssa, F.F.; Ayana, A.; Balemi, T. and Temesgen, M. (2015). Characterization and Assessment of Vegetable Production and Marketing Systems in the Humid Tropics of Ethiopia. Quarterly Journal of International Agriculture 54 (2015), No. 2; DLG-Verlag Frankfurt/M.

EPCDM (2013). Bananas and Bottlenecks: Piloting Regional Value Chain Cooperation for Food Security, 18-10-2013

Fabien Tondel (2017), Understanding the political economy of the EAC in the agricultural sector Private sector ambitions facing political headwinds, ECDPM

Famine Early Warning Systems Network (FEWS NET) (2018). Tanzania Market Fundamentals Summary.

FAO (2013). Investing in African Livestock: business opportunities in 2030-2050. World Bank, FAO, ILRI, AU-IBAR.

FAO (2014). Food Loss Assessments: Causes and Solutions Case Studies in Small-scale Agriculture and Fisheries Subsectors, Kenya. Banana, Maize, Milk, Fish, 2014.

FAO (2019). National gender profile of agriculture and rural livelihoods – Ethiopia. Country Gender Assessment Series, Addis Ababa. 84 pp. Licence: CC BY-NC-SA 3.0 IGO

Farmer, E. & Mbwika, J. (2012). End Market Analysis of Kenyan Livestock and Meat: A Desk Review. USAID, microREPORT #184, March.

FEWS Net (2019). Kenya Food Security Update: August 2019. Famine Early Warning Systems Network.

Fintrac Inc. (2012). Global Competitiveness Study: Benchmarking Kenya's Horticulture Sector for Enhanced Export Competitiveness. USAID, Kenya Horticulture Competitiveness Project.

Fleming, P. (2019). How food cold chains are improving lives and livelihoods in Asia and Africa. Greenbiz, 11 April 2019. Available at:

Government of Kenya (2019). Agricultural Sector Transformation and Growth Strategy, 2019-2029, Ministry of Agriculture, Livestock, Fisheries and Irrigation, Nairobi.

Hunder, NF. (2017). Opportunity, Problems and Production Status of Vegetables in Ethiopia: A Review.

ITC (2016). Kenya: Value Chain Roadmap for Pulses 2016-2020. International Trade Centre, Geneva.

ITC (2016). Pulses Sector Investment Profile Kenya

ITC (2020). ITC Trademap (database). Available at https://www.trademap.org/

J. Daly, D.Hamrick, G.Gereffi, A. Guinn (2016). Maize value chains in East Africa, International Growth Centre, October 2016. F-38202-RWA-1

JICA (2017). Project for Master Plan on Logistics in Northern Economic Corridor – Final Report. Japan International Cooperation Agency, March.

Joachim, D.; Matemu, A.; Ndakidemi, p. (2018). Potential of cooking bananas in addressing food security in East Africa. International Journal of Biosciences, Vol. 13, No. 4, p. 278-294.

Karamura D.A., Karamura E.B. and Tinzaara W. (editors) (2012). Banana cultivar names, synonyms and their usage in Eastern Africa, Bioversity International, Uganda

Kareem, O. I. (2019). Border Measures and Africa's Agri-Food Trade: Export Markets Comparative Analysis, Trade and Development Policy research network. WTO Agricultural Symposium, June 2019. Available at: https://www.wto.org/english/tratop_e/agric_e/s2_4_olayinka_idowu_kareem_symposium_presentation_27062019_pm.pdf

Kassa, L. (2015). UAE Imposes Indefinite Ban on Ethiopian Meat Exports. Fortune, October 5. Available from: https://addisfortune.net/articles/uae-imposes-indefinite-ban-on-ethiopian-meat-exports/

Kebede, E. (2020). Grain legumes production and productivity in Ethiopian smallholder agricultural system

Kilimo Trust (2015). Building Blocks of Trade in Food: Kilimo Trust Biennial Report - July 2012 – June 2014

Kilimo Trust (2017). Characteristics of Maize Markets in East Africa: Regional East African Community Trade in Staples (REACTS)

Kilimo-Trust (2012). Banana Value Chain(s) in the East Africa Countries: consumption, productivity and challenges. Kampala, Uganda: Kilimo Trust.

Kornher Lukas (2018). Maize markets in Eastern and Southern Africa (ESA) in the context of climate change, The State of Agricultural Commodity Markets, 2018

Matchmaker Associates (2017a). Horticulture study Phase 1: Mapping of production of fruits and vegetables in Kenya. Kingdom of the Netherlands, March.

Matchmaker Associates (2017b). Synthesis Report - Horticultural Tanzania & Kenya.

National Institute of Statistics of Rwanda (NISR) (2019). Rwanda Statistical YearBook 2019, December 2019

Njeru, T. N. (2017). Why Kenya's short-term fixes won't resolve its maize supply crisis. The conversation, October 24. Available from: https://theconversation.com/why-kenyas-short-term-fixes-wont-resolve-its-maize-supply-crisis-85548

O. Anyadike (2019). Drought in Africa leaves 45 million in need across 14 countries, The New Humanitarian. June 2019. Available at: https://www.thenewhumanitarian.org/analysis/2019/06/10/drought-africa-2019-45-million-in-need

Olga van der Valk (2005). Partnership for Market Access; towards a sustainable market-oriented horticultural sector in Uganda.

Peter Ranum (2014). Annals of the New York Academy of Sciences, Global maize production, utilization, and consumption, March 2014

Reddy, R., & Kanna, N. (2016). Value Chain and Market Analysis of Vegetables in Ethiopia – A Review. International Journal of Economics and Business Management, 2016, 2(1),90-99.

Selina Wamucii (undated). Four Countries, Four East African Banana Agendas. Available from: https://www.selinawamucii.com/four-countries-four-east-african-banana-agendas/

Shahidur Rashid (2010). Maize Value Chain Potential in Ethiopia: Constraints and opportunities for enhancing the system, IFPRI, July 2010

Short C., Mulinge W. & Witwer M. (2012). Analysis of incentives and disincentives for maize in Kenya. Technical notes series, MAFAP, FAO, Rome

SNV (2012). The Beans Value Chain in Kenya. SNV, HIVOS and Solidaridad, August. Available from: http://www.fao.org/3/a-at264e.pdf

Teshome, A., & Jochen, D. (2016). Horticulture value chains in Ethiopia: Opportunities for better nutrition and new market access? Available at http://www.tropentag.de/2016/abstracts/full/309.pdf

The International Trade Administration (ITA), U.S. Department of Commerce (2019). Rwanda Country Commercial Guide. Available at https://www.export.gov/article?id=Rwanda-Agriculture.

Tinzaara, W.; Ocimati, W.; Kikulw, E; Otieno, G.; Stoian, D.; Blomme, G. (2018). Challenges and opportunities for smallholders in banana value chains. Oct 2018

TTCANC (2020). Joint Norther and Central Corridors Performance Report. Northern Corridor Transit Transport Coordination Authority & Central Corridor Transit Transport Facilitation Agency. Available at http://www.ttcanc.org/documents/Joint_NCTTCA_and_CCTTFA_Corridors_Report_ENGLISH.pdf

Uganda Bureau of Statistics (2020), 2019 Statistical Abstract.

UNDP (2012). A Value Chain Analysis of the Dry Bean Sub-sector in Uganda. Development of Inclusive Markets in Agriculture and Trade (DIMAT) Project.

United Republic of Tanzania (URT) (2015). Tanzania Climate Smart Agriculture Programme Coordinated by Ministry of Agriculture Food Security and Cooperatives and Vice President's Office, Dar-es Salaam.

USAID (2016). Rwanda Early Generation Seed Study. USAID.

USAID (2018). Postharvest loss assessment of Green Bananas in Rwanda. USAID.

USAID Feed the Future (2019). Global Food Security Strategy. East Africa Regional Plan 2019-2024. Feed the Future.

VSO (2015). Value Chain Analysis of the fruit and vegetable market for smallholder farmers in Zanzibar.

VSO (2015). Value Chain Analysis of the fruit and vegetable market for smallholder farmers in Zanzibar. Available at: https://www.vsointernational.org/sites/default/files/VSO%20Value%20Chain%20Analysis%20CASH.pdf

WTO (2019). Trade Policy Review – Kenya. World Trade Organisation, WT/TPR/S/384, Geneva.

WTO (2019). Trade Policy Review: East African Community. Report by the Secretariat. World Trade Organisation, Geneva.

Zenebe Woldua, Ali Mohammedb , Derbew Belewc , Zekarias Shumetad , Adam Bekelee (2015). Assessment of Banana Production and Marketing in Ethiopia, International Journal of Sciences: Basic and Applied Research (IJSBAR), Volume 24, No 3, pp 283-307

Zinabu Ambisa, Bikila Tesfa, Temsgen Olani and Diriba Abdeta (2019). Review on the Production and Marketing of Banana in Ethiopia, World Journal of Agriculture and Soil Science, April 2019.

Annexes

1. Common Challenges to the Agricultural Sector

The table below summarises the common challenges to the agricultural sector in East Africa via the study of five value chains.

Summary of Challenges	Value Chains
Low use of certified seeds, poor soil management, and inadequate use of pesticides and fertilizers	*Beans, Maize, Vegetables*
Big post-harvest losses	*Beans, Maize, Vegetables*
Lack of linkages between research and the seed supply system	*Beans, Maize, Vegetables*
Poor quality extension services.	*Beans, Maize, Vegetables*
Lack of organized marketing and information dissemination systems	*Beans, Maize, Vegetables*
Weak disease and pest control mechanisms	*Beans, Maize, Vegetables*
Lack of coordination of policies related to beef at the regional level	*Beef*
Low genetic potential	*Beef*
High levels of calf mortality and morbidity / inefficient veterinary and animal health extension services, shortages of medicines, poor quality control of medicines and other supplies	*Beef*
Low-quality standards low biosafety levels in abattoirs, poor disease surveillance, and a lack of a national traceability and identification scheme	*Beef*
Poor animal feed/ insufficient grazing grounds and irregular supply of feed supplements	*Beef*
Lack of adequate infrastructure for the processing of beef	*Beef*
Weak Stakeholder/Operator Networks	*Beef*
Limited access to key inputs for improved cultivation (fertilizers, pesticides, farm machinery and implement, quality planting materials)	*Bananas*
Cultivation of Banana plans in unsuited areas	*Bananas*
Low quality/quantity product due to poor transport, handling, insect damage, poor storage, and display facilities, mechanical damage leading to softening of the bananas, breakages, and bruises	*Bananas*
Lack of strong networks amongst farmers	*Bananas*
Lack of appropriate processing equipment	*Bananas*
Long supply chain resulting in losses in quantity and quality of the product as well as lower prices	*Bananas*

Source: IEC

2. Regional Policy Overview

The main objective of the EAC in the agricultural sector is to achieve food security and a greater rationalization of production. As highlighted in the EAC Treaty, Member States should aim to increase their agricultural productivity and output to reduce hunger and poverty and to achieve food and nutrition security in the region. This has been reflected in a number of policy documents:

1. The 2006 East African Community (EAC) Agriculture and Rural Development Policy (ARDP).
2. The 2006 EAC Agriculture and Rural Development Strategy (ARDS).
3. Food Security Action Plan (FSAP).
4. Comprehensive Africa Agriculture Development Programme (CAADP).

The EAC ARDP 2005-2030 constitutes the common agricultural policy of the EAC. It indicates the general orientation of EAC policy in this sector and provides a framework for public intervention in favor of agricultural development and related sectors at the regional level. **This is complemented by the EAC ARDS,** which outlines specific interventions in four thematic areas (production, trade, supporting infrastructure and services, and natural resources management) over the period 2005-2030; it also contains provisions for institutional arrangements supporting the implementation of the ARDP. The overall objectives of the aforementioned documents are the achievement of food security and rational agricultural production with a set of specific objectives.

The Food Security Action Plan (FSAP), adopted in 2011, is one of the key instruments developed to operationalize the EAC-ARDP. This covers numerous intervention areas such as agricultural production, agro-food processing, research and innovation, agricultural inputs, plant and animal disease control, food quality and safety, trade, agricultural risk management, emergency preparedness, and response in arid and semi-arid regions and pastoralists communities. Some of the key policies developed under this framework are:

Table 22 Major components of the FSAP

Intervention	Implementation status
EAC Food Security and Nutrition Policy (FSNP)	FSNP Implementation Strategy was formulated in 2016
EAC Livestock Development Policy	Includes an initiative to strengthen the regional livestock data system. Approval Pending
EAC Protocol on SPS Measures	Approved in 2009 and endorsed by the Council of Ministers in 2010. Ratification of the Protocol is underway. The Aflatoxin Prevention and Control project is being implemented; the Smartfish project is underway; the seed harmonization process is underway; the harmonization of veterinary vaccines is underway.
EAC Strategy on prevention and control of transboundary animal and zoonotic diseases – EAC Emergency Preparedness and response plan for pastoralists in arid and semi-arid areas in the region	N/A
EAC Food balance sheet framework	A regional strategic food reserve is envisaged as the next step
EAC Agricultural Development Fund	The Agricultural Development Fund Framework and Modalities have been drafted

Intervention	Implementation status
East African Agro-industry and Agro-enterprise Development Programme (E3ADP)	The FAO Technical Cooperation Programme has supported the formulation of the E3ADP The East African Agro-industry and Agri-enterprise Investment Strategy (E3AIS) was adopted in 2014

The CAADP is an agricultural program of the New Partnership for Africa's Development (NEPAD). Created in 2003, the CAADP aims to improve food security, nutrition, and increase incomes in Africa's largely farming-based economies. The main targets of the CAADP are: (i) to raise agriculture growth to at least 6 percent per year; and (ii) to increase public investment in agriculture to at least 10 percent of the national budget per year.

CAADP identifies four key pillars for food security improvement and agricultural investment: (1) Sustainable Land and Water Management; (2) Market Access; (3) Food Supply and Hunger; and (4) Agricultural Research. The CAADP is centered around defining national and regional plans - also known as Compacts. At the EAC level, the Regional Compact aims at addressing the issues of regional nature that impact the Member States. Such issues are Trade facilitation and mutual recognition arrangements in order to facilitate access to markets for agricultural products in the EAC region; control of cross-border/transboundary diseases and pets; harmonization of SPS measures; trade policy harmonization on importation/exportation of inputs from outside EAC; harmonization of standards / technical specifications; harmonization of policies on use and management of shared ecosystems/resources; and the development of regional information management and sharing systems.[134]

Following the adoption of the regional CAADP Compact, the EAC embarked on the formulation of an EAC Regional Agricultural Sector Investment Plan (RASIP) intending to channel public and private to the Compact. This Investment Plan provides a results framework for all state and non-state actors to align their interventions and activities towards the objectives of the RASIP. It indicates three levels of results/objectives.[135]

Table 23 Objectives of the EAC RASIP

Intervention level	EAC agricultural policy's goals and objectives
Highest Level	Contribute to economic growth, improve food and nutrition security conditions, reduce poverty, strengthen resilience and create a range of economic opportunities in and around the agricultural sector.
Intermediate level	Enhancing agricultural productivity, improving the competitiveness of regional agro-food products, easing intra-regional trade and the performance of markets, and increased production and value addition through the development of the agro-food industry and value chains, improving the resilience of livelihoods and the management of agricultural risk, and managing natural resources more sustainably.
Lowest level	Strengthen the capacities of various actors and institutions contributing to the systemic transformation of the agricultural sector, notably agricultural producers, market operators, the agro-food industry and traders, households working in and around the agricultural sector (notably women and the youth), and various actors managing natural resources

However, the implementation of such policies and strategies is facing challenges, as highlighted by Tonsel (2017) below:

[134] Afun-Ogidan Dolly, van Seters Jeske, and Rampa Francesco (2012). Regional approaches to food security in Africa, ECDPM Discussion Paper n° 128c
[135] Fabien Tondel (2017), Understanding the political economy of the EAC in the agricultural sector Private sector ambitions facing political headwinds, ECDPM

- There is little indication of how the EAC agricultural policy will:
    - support the capacities of actors of change;
    - provide incentives for public and private actions aligned with its objectives at different levels;
    - conduct policy and institutional reforms required to attain its objectives.
- A number of results indicators seem difficult to measure and/or unlikely to reflect desirable social, economic, financial, and institutional changes required to achieve the transformative agenda of the EAC agricultural policy.
- The EAC Secretariat is ill-equipped to fulfill its role and responsibilities, especially to ensure that regional policies are implemented.
- There are no significant regional financial instruments in place to support the Member States or non-state actors in implementing regional policies, or for the Secretariat to implement regional interventions.
- The EAC is planning to establish an Agricultural Development Fund to (co-)finance projects, but at this time it does not have any financial instruments to support investments or provide incentives to states and non-state actors playing a role in the regional agricultural and food security strategy.
- Limited institutional capacity of the Secretariat (by the few human and financial resources) to follow through on the monitoring and enforcement of regional agreements and protocols
- The Secretariat has been severely constrained in its ability to reach out to national policymakers, notably agriculture ministries, and non-state actors to sensitize them about the FSAP, CAAPD, and related policies.
- No consistent consultation framework between the East African Legislative Assembly (EALA) Committee on Agriculture, Tourism and Natural Resources (ATNR), farmers' representatives, other business and civil society actors concerned with the agricultural sector, and representatives of Member States (for example, national CAADP Focal Points).
- The financial commitment of 10 percent of the budget allocation according to the Maputo declaration was not achieved by EAC member states.
- Cumbersome, costly, and time-consuming cross-border trade procedures (customs and certification procedures notably) have been hampering cross-border shipments of goods (which explains the high level of informal cross-border trading).
- IGAD, ECCAS, and COMESA have also developed agricultural and food security policies, posing the problem for complementarity, coherence, and effectiveness of these different regional policies with however weak institutional mechanisms to facilitate coordination and harmonization.
- The strongest tensions arose between the continental institutions and the RECs, especially when the latter had already made substantial strides towards developing their regional agricultural policies and associated mechanisms
- Low impacts of non-state actors on CAADP-related policy planning were due to weak organization of farm and rural interests, lack of political will, mistrust between bureaucrats and non-state actors, bureaucratic interests in preserving control over budget allocations, and lack of incentives to commit resources to dialogues and negotiations with non-state actors.
- The lack of involvement of non-state actors in agricultural policy planning has probably contributed to the investment deficit in agro-food value chains observed in the region, in comparison to the ambitious investment plans outlined by public institutions

- Large-scale infrastructure projects financed by Chinese actors have been carried out outside EAC policies/programmes, through bilateral agreements with national governments to implement the national infrastructure policy agenda. However, these projects may have caused coordination failures among EAC countries and sectors.
- Member states exhibit little real interest in the regional dimension of agricultural policy in the EAC. Their attention is much more on their national agricultural development strategies and agricultural policies even though the regional CAADP Compact and investment plan aimed to support these.

3. List of Stakeholders in Agricultural Value Chain in East Africa

Top Agricultural Traders/Offtakers in EAC

Country	Name	VC Segment	Crop(s)	Website	Contact details
Kenya	Bidco Africa	Manufacturers	Cattle feed, Poultry Feed, Sow meal, Vegetable oil, and fats	https://www.bidcoafrica.com/	Tel No: 067 2821000
Kenya	Delmonte Kenya Limited	-Producers -Manufacturers	Tomatoes, Beans, Corn, Peas, Carrots, Potatoes, Beets, Asparagus, Fruits (Mangoes, Mandarin oranges, asparagus, pineapples, pears, etc.)	https://www.delmonte.com/	Tel No: 020 2141601
Kenya	Kakuzi PLC	-Producers -Suppliers	Avocado, Macadamia, Blueberry, Tea	https://www.kakuzi.co.ke/	Tel No: 254 722 205895 / 254 722 205896/ 254 722 205342 Email address: mail@kakuzi.co.ke Customer service: Brendon Scott, Chief Operating Officer bsott@kakuzi.co.ke Sustainability: Dr. Wilson Odiyo, Assistant General Manager Corporate Affairs wodiyo@kakuzi.co.ke
Kenya	Kenya Nut Company	Processors	Macadamia nuts, Cashew nuts, Coffee, Tea	https://www.kenyanut.com/	Tel No: 0733 622892 Email address: info@kenyanut.com
Kenya	East Africa	Producers Suppliers	Vegetables (Cabbage, Cauliflower, Broccoli, Collard, Onions, Sweet pepper, Sweet melon,	https://easeed.com/	Tel No: +254 722207747/ +254734333161

Country	Name	VC Segment	Crop(s)	Website	Contact details
	Seed Company		Squash, Tomato, Watermelon, Carrot, Butternut, Cucumber, Lettuce, Radish, Peas, Spinach, Zucchini, Swiss chard, Turnip Herbs (Celery, dill, fennel, Mint, sage, marjoram, Parsley, Thyme)		Email address: info@easeed.com
Kenya	Kenya Seed Company -Kenya, Tanzania, and Uganda	Producer Supplier	Maize, wheat, pasture, sorghum, sunflower, finger millet, legumes, rice, groundnuts, sim sim, horticultural crops	https://kenyaseed.com/	1. Kenya Tel No: +254722205144/ +254726141856 2. Uganda: Tel No: +256 (414) 250544 / +256 752 2505444 Email: info@simlaw.co.ke 3. Tanzania Tel No: +254 (20) 2215067 / 83 or +254 (20) 2602191 / 93 Email: admin@simlaw.co.ke
Kenya	Brookside Dairies	Processor	Milk and milk products (butter, cheese, yogurt, cream)	https://www.brookside.co.ke/	Tel No: 020 2354677, 0730 631 000, 067 5861000 Email Address: maziwa@brookside.co.ke
Kenya	Finlay Flowers Ltd	Manufacturer Supplier	Tea, Coffee, botanical products (herbal powder, tea herbal concentrate, fruit veg powder, compound herbal concentrates and powder mixes, natural sweetener)	https://www.finlays.net/about-us/overview/	Tel No: +254 704 320300 / +254 722 205860
Kenya	Unilever Tea Kenya	Producer Supplier	Tea	https://www.unilever-ewa.com/	Tel No: +254 (0) 709 050 600/ +254 (0) 709 050 800
Kenya	Sasini PLC	Producer Processor Supplier	Coffee Avocado Macadamia nuts, Dairy products	https://sasini.co.ke/	Tel No: (+254-020) – 3342166 (+254-020) – 3342171/2, 3342258 Email Address: info@sasini.co.ke

Country	Name	VC Segment	Crop(s)	Website	Contact details
Kenya	Williamson Tea	Producer Processor Supplier	Tea	https://www.williamsontea.com/	Email address: customerservice@williamsontea.com
Kenya	Rea Vipingo	Producer Supplier	Sisal	https://www.reavipingo.com/	Tel No: (+254) 20 6007091 / 6007169 Email Address: info@reavipingo.co.ke
Kenya	Mumias Sugar	Producer	Sugar cane products (white and brown sugar)	http://mumias-sugar.com/	Website: http://mumias-sugar.com/ Tel No: +254 711 094 000 | +254 734 600 334/5 Email Address: msc@mumias-sugar.com
Uganda	Equator Seed Company	Supplier	Maize, Dry Beans, Sorghum, Tomatoes, Watermelon, Carrots, Zucchini, Bell peppers, Cabbage, Onions, Okra, Pumpkin Eggplant	https://equatorseeds.com/index.html	Tel No: +256 782620830/+256774595651
Uganda	Fica Seeds	Producers and Suppliers	Seeds (maize, sorghum, rice, soybean, beans, groundnuts, serenut, millet, sesame, cassava) Fertilizers	https://www.accesstoseeds.org/about/	Tel No: +256 414 566 631/+256 782 451 995/ +256 700 566 631 Email Address: info@ficaseeds.com

Public agricultural companies listed on the Nairobi Securities Exchange

Country	Company	VC segment	Crops	Website	Contact details
Kenya	Kakuzi	Producer Supplier	Avocado, Macadamia, Blueberry, Tea	https://www.kakuzi.co.ke/	Tel No: 254 722 205895 / 254 722 205896/ 254 722 205342 Email address: mail@kakuzi.co.ke Customer service: Brendon Scott, Chief Operating Officer bsott@kakuzi.co.ke Sustainability: Dr. Wilson Odiyo Assistant General Manager Corporate Affairs

Country	Company	VC segment	Crops	Website	Contact details
					wodiyo@kakuzi.co.ke
Kenya	Sasini	Producer Processor Supplier	Coffee Avocado Macadamia nuts, Dairy products	https://sasini.co.ke/	Tel No: (+254-020) – 3342166 (+254-020) –3342171/2, 3342258 Email Address: info@sasini.co.ke
Kenya	Kapchorua Tea Company Ltd	Producer Manufacture Supplier	Tea	https://ktga.or.ke/kapchorua-tea-co-ltd.html	Tel No: +254-053-643012
Kenya	Limuru Tea PLC	Producer Supplier	Tea	https://www.unilever-ewa.com/	Tel No: +254 (0) 709 050 600/ +254 (0) 709 050 800
Kenya	Williamson Tea	Producer Processor Supplier	Tea	https://www.williamsontea.com/	Email address: customerservice@williamsontea.com
Kenya	Rea Vipingo Plantantions	Producer Sisal	Sisal	https://www.reavipingo.com/	Tel No: (+254) 20 6007091 / 6007169 Email Address: info@reavipingo.co.ke
Kenya	Eaagads	Producer Processor Supplier	Coffee	https://www.eaagads.co.ke/	Tel No: +254 (020) 8011041 Email Address: info@eaagads.com

World's top agribusinesses with a presence in Kenya

Country	Company	Vc segment	Crops	Website	Contact details
USA	Cargil	Processor supplier	Tea, wheat, maize, barley, soybean meal	https://www.cargill.com/worldwide/kenya	Tel No: +254 20 51 47 700
Singapore	Wilmar International	Production Processor distributor	Palm oil, sugar cane, animal products, edible food products, industrial agri-products (oleochemicals and biodiesel)	https://www.wilmar-international.com/	Tel No: Email Address:1. info@wilmar.com.sg 2. enquiry-africa@sg.wilmar-intl.com

Country	Company	Vc segment	Crops	Website	Contact details
France	Louis Dreyfus Commodities	Producer Processor Supplier Brokers	-Animal feed and pet food -Cereals, coffee, edible oils, fruit juices, pulses, sugar, rice	https://www.ldc.com/	Tel No: 041 222 39 58 Email Address: mom-allusers@ldcom.com

Chambers/Associations of Agriculture in EAC

Country	Name	Website	Contact (Email or Phone)
EAC	Eastern Africa Grain Council	http://eagc.org/about-us/	Tel: +254 733 444 035 / +254 710 607 313 Email: grains@eagc.org
Burundi	Confederation of Associations of Agricultural Producers for Development	www.capad.info	Tel: +257 22217902/ +257 79952176 Email: capad_shirukubute@yahoo.fr
Kenya	Kenya Agrobusiness and Agroindustry Alliance	http://kaaa.co.ke/	Tel: +254-20-237-1307
Kenya	Agriculture and Food Authority	www.afa.go.ke	Phone: +254-722200556/734600944 Email: info@afa.go.ke
Kenya	Kenya National Chamber of Commerce and Industry	https://www.kenyachamber.or.ke/	Tel No: +254 782 392 700 Email: info@kenyachamber.or.ke
Uganda	Uganda Agribusiness Alliance	https://agriprofocus.com/organisation/uganda-agribusiness-alliance	Tel No: steve.hodges@ugandaagribusinessalliance.com
Uganda	Young Farmers Federation of Uganda	https://unyfa.org/	Phone: +256 393241565 / +256 774 532 670 Email: unyfa2016@gmail.com / info@unyfa.org
Uganda	Association of Uganda Professional Women in Agriculture and Environment	http://aupwae.net/	Phone: 256-41-342035/0312-270564 Email: info@aupwae.net
Tanzania	Sustainable Agriculture Tanzania	https://kilimo.org/	Email: info@kilimo.org Phone: +255 (0)754 925 560; Email: janet.maro@kilimo.org Phone: +255 (0) 655 219060 Email: alex.wostry@kilimo.org

4. List of Market Information Systems in Africa

Name of the system	Lead Implemented (Company or donor)	Country/Region coverage	Commodities covered	Variables collected	Data collection methodology	Dissemination methodology
AMIS G20 Agricultural Market Information System http://www.amis-outlook.org/home/en/	Governed by a Steering Committee that includes: FAO, GEOGLAM, IFPRI, IFAD, International Grains Council, OECD, UNCTAD, World Bank Group, WFP & WTO	G20 countries (including South Africa) + Spain and 7 other major countries in the agricultural sector (Egypt, Japan, Kazakhstan, Nigeria, Philippines, Saudi Arabia, Thailand, Ukraine & Vietnam).	Global food supplies mainly wheat, maize, rice, and soybeans	Unit supply, opening stocks, production, food use, feed use, closing stocks (Yearly)	Mainly based on the *FAO Food Price Index, Cereals Price Index, Sugar Price Index, Vegetable Oils Price Index, Dairy Price Index, Meat Price Index.*	Through the dashboard, information can be obtained on a yearly basis
GIEWS FMPA (Food Price and Monitoring Analysis) Tool https://fpma.apps.fao.org/giews/food-prices/tool/public/#/home	Governed by FAO	Worldwide coverage	Food supplies (including bread, cassava, maize, meat, milk, palm oil, potatoes, rice, sugar, and wheat)	Commodity coverage, Unit of measure and Prices in USD & home currency,	Data sourced from each country's respective Ministry and their agricultural institutions/organizations	Through the tool, weekly, monthly retail, and wholesale prices.
InfoTrade https://infotradeuganda.com/	Led by FIT Insights Group	Uganda	Food supplies such as Mushroom, cabbage & shea oil	Sharing of information on production, market, and payment transaction (in terms of prices, volume & quantity)	Data collected from 25 major markets across the country	Has monitoring dashboards, and can provide weekly reports as well as historical information
Regional Agricultural Trade Intelligence Network (RATIN) https://ratin.net/	Led by USAID	Regional coverage in East Africa for 5 countries (Burundi, Kenya, Rwanda, Tanzania & Uganda)	Maize, Mixed Beans (Red beans, yellow beans, black beans, etc), Millets & Peas	Market prices, border volumes,	Through Border observation technique, Tracking technique, and Stocktaking techniques	Dashboards providing information relating to warehouse grain storages, early marketing, and trade info
Afrique Verte Internationale (AVI) http://www.afriqueverte.org/index.cfm	Main donor: European Commission	Burkina Faso, France, Guinea, Mali & Niger,	Food supplies (cereals, grains, rice)	Technical information regarding prices, grain operators, farming season, and overall food situation	Data collected by field animators from AcSSA (in Niger), AMASSA (in Mali), and APROSSA (in Burkina Faso)	Monthly bulletin issued electronically

Name of the system	Lead Implemented (Company or donor)	Country/Region coverage	Commodities covered	Variables collected	Data collection methodology	Dissemination methodology
National Association of Producer Organizations of Ivory Coast (ANOPACI)	Funded by Members' contribution	Ivory Coast	Agricultural products	Consumer & wholesale prices, average trend of market products	Via interviews done by animators of Village Information Points (VIP)	Disseminated through radios (main) and billboards
National Society for the Management of Food Security Stock (SONAGESS) https://sonagess.bf	Government of Burkina Faso	Burkina Faso	Agricultural products (cereals, protein & oil products)	Warehouses & stock management cost, Prices, (producer, wholesale & consumer prices)	Data collected via interview covering over a 48 markets	Disseminated through paper/electronic format and over the radio (weekly basis)
Observatoire du Marche Agricole (OMA) http://www.oma.gov.ml/	Assemblée Permanente des Chambres d'Agriculture du Mali (APCAM)	Mali	Products in Agro-Industry	Prices (wholesale and consumer) & Production capacity	Via interviews and Observation by reporters	Via monthly bulletins and disseminated over the radio & on TV
Ethiopian Commodity Exchange (ECX) https://www.ecx.com.et/	Government in partnership with its Members	Ethiopia	Agricultural products	Prices, Volume of trade & Warehousing cost	Via monitoring transaction changes for products	Via website, Electronic ticker board, Print media, TV & Radio
SIMA Mozambique	Governed by Ministry of Agriculture	Mozambique		Price, Transport Costs, Availability of product flow	Via interviews and Observation by reporters	Via weekly bulletin (Quimbe Quimbe), radio & notice boards https://cgspace.cgiar.org/handle/10568/57537
Kenya Agricultural Commodity Exchange (KACE)	In partnership with West Media Limited (WML)	Kenya	Agricultural products	Prices, Demand & Supply of various commodities traded,	Via interviews and observation by reporters	Via website, Electronic ticker board & Print media
Esoko Ghana https://esoko.com/	In initial partnership with USAID	Ghana	Agricultural products	Price	Via the mobile app tool "Insyt" – (mobile surveys)	Providing market prices through SMS

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