



EAST AFRICAN COMMUNITY



East African Community
Fruits and Vegetables Value Chain Strategy
and Action Plan 2021-2031



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Fruits and Vegetables Value Chain Strategy
and Action Plan 2021-2031**

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List of Acronyms and Abbreviations

ACP	African Caribbean and Pacific
AECF	Africa Enterprise Challenge Fund
AEZ	Agri-Export Zones
AGOA	African Growth and Opportunity Act
ALVs	African Green Leafy Vegetables
ARSO	African Organization for Standardization
ASPF	Agricultural Sector Policy Framework
AUC	African Union Commission
BCAs	Biological Control Agents
BRA	Burundi Revenue Authority
CAADP	Comprehensive Africa Agriculture Development Programme
CAGR	Cumulative Annual Growth Rate
CBC	Century Bottling Company
CBT	Cross Border Trade
CET	Common External Tariff
CIF	Cost Insurance & Freight
CoC	Certificate of Conformity
COMESA	Common Market for Eastern and Southern Africa
DRC	Democratic Republic of Congo
EAC	East African Community
ECOWAS	Economic Community of West African States
EPA	Economic Partnership Agreement
EPZ	Economic Processing Zones
EU	European Union
F&Vs	Fruits and Vegetables
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct investment
FNSAP	Food and Nutrition Security Action
FTA	Free Trade Area
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GMP	Good Manufacturing Practices
GS	Generalized System of Preferences
GVCs	Global Value Chains
HACCP	Hazard Analysis and Critical Control Point
HS	Harmonized System
HVA	High-Value Agriculture
ICBT	Informal Cross Border Trade
IDF	Import Declaration Form
IIDS	Integrated Industrial Development Strategy
UNIDOSTAT	UNIDO Statistical Database
IP	Intellectual Property
IPM	Integrated Pest Management
IPR	Intellectual property rights
IRs	Intermediate Results
ISM	Import Standards Mark
ITC	International Trade Centre
KRA	Kenya Revenue Authority

LDC	Least Developed Countries
LED	Local Economic Development
LGV	Leafy Green Vegetables
LVAC	Local Value-Added Content
MAPs	Medicinal and Aromatic Plants
MDAs	Ministries Departments and Agencies
MIS	Marketing Information System
MSME	Micro, Small, and Medium Enterprises
MFN	Most Favoured Nation
MRL	Maximum Residue Levels
MVA	Manufacturing Value Addition
NCDs	Non-Communicable Diseases
NQFs	National Qualification Frameworks
NSAs	Non-State Actors
NTB	Non-Tariff Barriers
OSBP	One-Stop Border Post
PPP	Public-Private Partnership
PVs	Private Voluntary Standards
R&D	Research and Development
RIVA	Regional Industrial Value Addition
RRA	Rwanda Revenue Authority
RQFs	Regional Qualification Frameworks
RVCs	Regional Value Chains
SADC	Southern Africa Development Community
SALL	Sameer Agriculture Livestock Ltd
SCT	Single Customs Territory
SCAFS	Sectoral Council on Agriculture and Food Security
SCTIFI	Sectoral Council on Trade Industry Finance and Investment
SEAMPEC	Support to East African Market Driven and People-Centred Integration
SGR	Standard Gauge Railway
SIDP	Sustainable Industrial Development Policy
SMEs	Small and Medium Enterprises
SPS	Sanitary and Phytosanitary
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TBT	Technical Barriers to Trade
TDV	Tanzania Development Vision
TMEA	Trade Mark East Africa
TFA	Trade Facilitation Agreement
TRA	Tanzania Revenue Authority
TVET	Technical and Vocational Education Training
TWG	Technical Working Group
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
URA	Uganda Revenue Authority
USA	United States of America
VAT	Value Added Tax
WITS	World Integrated Trade Solution
WTO	World Trade Organization

Foreword



The East African Community (EAC) has developed and adopted the ***"EAC Fruits and Vegetables (F&V) Value Chain Strategy and Action Plan, 2021-2031"***. It aims at providing a regional roadmap to steer the development of the fruits and vegetables sub-sector. The sub-sector directly supports employment, provides diversified nutrition and food security with bal-

anced and healthy diets and provides opportunities for processing.

Fruits and vegetables sub-sector in the region plays a significant role in the economic development of EAC Partner States economies, variably contributing between 20% and 36% of agricultural Gross Domestic Product (GDP). Fruits and vegetables exports from Sub-Saharan Africa grew significantly between 2002 and 2018 with trade volumes increasing by a Compounded Annual Growth Rate (CAGR) of 12%. The imports to emerging markets, such as the East Asian market, also experienced a CAGR of 10.1%. At the regional level, trade in F&V products is estimated at around 1.3 million tons per year, with a high proportion of fresh products (87%), and modest pro-

cessed products (13%). There is significant potential for value addition in the sub-sector as currently the F&V sector suffers from limited processing technologies contributing about 8% of regional manufacturing GDP and up to 14% manufacturing value-added (MVA).

Despite the potential, the regional F&V sub-sector production base across the EAC is fragmented, small holder dominated, with low productivity. Other challenges include; climate change variability, diseases and pests, supply chain seasonality, limited business development services, limited quality infrastructure, limited processing technologies for value addition, high post-harvest losses, and underdeveloped logistical infrastructure, amongst others. To counter the challenges and harness the opportunities in the sub-sector, the EAC has adopted this regional strategy and action plan to be implemented over a 10-year development period. Using a market-led approach, the strategy aims to enhance the sub-sector into a longterm competitive regional enterprise with activities that are capable of sustainably contributing to the regional economic development and integration.

The Strategy and Action Plan proposes interventions that will lead to: an increase in production capacity for fresh and processed F&Vs; strengthening of research, development and innovation, and processing technologies; development and improvement of

packaging services; promotion of market access and trade facilitation; and promotion of nutritional and medicinal indigenous fruits and vegetables among others.

The implementation of this Strategy and Action Plan is set to drive growth of the sub-sector in the region. The Strategy therefore sets measurable strategic objectives and incorporates actions considered essential to further support the industry's development and achieve growth targets by 2031. They include; increase in the area under fruits production in the EAC by 5 % to 10 million hectares, accompanied by 4 % increase in productivity; increase exports to the global market for fruits to increase to US\$ 350million from the current US\$ 125 million; create employment opportunities of up to 4,000,000 direct jobs; reduce post-harvest losses from the current 40% to 20%; increase the proportion of processed fruits from the current 8% to 16%; among others.

To supplement the Strategy and Action Plan and to improve quality of products in the value chain, the EAC, in collaboration with the Physikalisch-Technische Bundesanstalt (PTB), have developed the ***EAC Regional Action Plan for Quality Infrastructure in Fruits and Vegetables Value Chain (EACRAPQIF&VS), 2021-2023***. The strategic interventions outlined to improve quality infrastructure include: raising

awareness of the importance of quality; implementing good manufacturing practices and improving testing capacities and availability of testing service.

The EAC Secretariat remains committed to ensuring the growth and sustainability of this sub-sector, and in this context, welcomes key stakeholders and development partners to support its strengthening. The successful implementation of the Strategy and Action Plan requires the concerted effort of all EAC Partner States and a multi-sectoral approach, including national ministries of industry, agriculture, trade and finance, as well as national academic and research institutions, private sector players, non-state actors and international development partners. In view of the importance of the sub-sector to the people of East Africa and its' contribution to agricultural and industrial development, I urge all the stakeholders to take appropriate measures as outlined in the strategy for its successful implementation.



Hon. (Dr.) Peter Mutuku Mathuki
Secretary General
East African Community

Acknowledgment



The adoption of the “East African Community Fruits and Vegetables Value Chain Strategy and Action Plan 2021-2031” comes at a time when the world is gearing up the development of global valuechains. The fruits and vegetables (F&V) sub-sector is important to the region, due to its multi-sectoral nature of contributing to food security, nutrition and

economic development through value addition. As EAC fruits and vegetables markets become increasingly integrated, the products become more widely available throughout the year, helping stabilize prices and potentially increasing household incomes and increasing processing and trade.

This document has been developed by a consultancy team comprising a regional consultant and EAC Partner States national F&V focal points and was guided by technical and policy inputs by various national, regional and international stakeholders. In this regard, the EAC Secretariat wishes to acknowledge the participation, contribution and dedication of the EAC Partner States participating during national consultative workshops, interviews and focus group discussions. Key national stakeholders were drawn from private sector fruits and vegetables processors, National Ministries responsible for Industrial Development, Agriculture and East African Community Affairs, National Horticultural Associations, National Manufacturing Associations, National Agriculture and Food Authorities, National Research Institutes and Organizations, Agricultural Research organizations, National Bureaus of Standards, Small Industries Development Organizations, Private sector Foundations, Academia among others.

The invaluable technical and financial support provided by the Federal Republic of Germany, through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) under the GIZ-EAC Support to East African Market-Driven and People Centered Integration Programme (SEAMPEC) implemented by the Regional Industrial Value Addition Project (RIVA) is highly acknowledged and appreciated. Further the Secretariat wishes to acknowledge the support provided in the area of Quality Infrastructure by Physikalisch-Technische Bundesanstalt (PTB), German Metrology Institute and data and information provided by the Europe-Africa-Caribbean-Pacific Liaison Committee (COLEACP). Last but not least, the Secretariat wishes to recognise the tireless efforts of the EAC staff from the productive sectors on the successful stewardship of the development of this strategy.

In conclusion, I wish to emphasize that the Secretariat will ensure a coordinated and collaborative approach by all the relevant departments of the EAC Secretariat (Agriculture, Industry and Trade), Partner States’ national ministries and institutions fruits and vegetables processing associations, as well as development partners, to successfully implement this document. This coordination will seek to synergize and harness existing national, regional and international initiatives, towards strengthening value addition in the fruits and vegetables sub-sector. The EAC Secretariat will take the lead responsibility in mobilizing and optimally deploying the necessary resources, including personnel, for the successful implementation of the strategy, while the Partner States will drive the implementation in their respective countries through their national budgets.

A handwritten signature in blue ink, belonging to Hon. Christopher Bazivamo. The signature is stylized and fluid, with a long horizontal stroke extending to the right.

Hon. Christopher Bazivamo
Deputy Secretary General
(Productive and Social Sectors)
East African Community

Executive Summary

This document presents an East African Fruits and Vegetables Value Chain Strategy and Action Plan 2021-31. The Strategy and Action Plan has been developed by the GFA Consulting Group, as part of technical assistance to the East African Community under the project "Support to Regional Industrial Value Addition (RIVA) in the EAC", which is being implemented by GFA Consulting Group on behalf of the GIZ project entitled: "Support to East African Market Driven and People-Centred Integration "(SEAMPEC).

The role of the F&V sub-sector in the EAC

The F&V sector plays a significant role in the EAC economies although its overall share in manufacturing is still very small (4 to 12 percent¹) as is the manufacturing value added per capita. Due to its growing importance, the sector is of strategic importance to the socioeconomic development of the region. The F&V sector represents 20-36 percent of the Agriculture GDP in the EAC Partner States.² The sector has the potential for huge and provides a promising economic opportunity for reducing rural poverty in the EAC. The most direct contribution is through generating higher incomes for farmers. Studies have found that farmers engaging in F&Vs, earn significantly higher incomes than farmers producing other products because horticulture products are high-value products.

The F&V sector is of prime interest to all EAC national governments because it is a labour-intensive sector as compared to staple food production. The sector provides the potential for addressing employment challenges, especially among youth and women. Significant employment opportunities are created through crop growth periods, (planting, weeding, and harvesting) about twice the labour input per hectare of cereals, and more off-farm jobs in processing, grading, packaging, delivery to exporters 'factories or collection centres, and marketing. Most of the off-farm employment opportunities accrue in the value-added processing activities up the value chain.³ Additionally, as many of the F&V products are new to farmers, they get an opportunity to learn and upgrade their agricultural skills (like irrigation and farming methods) but also through technology transfer to the wider community, for example, on the construction of greenhouses, boreholes, or irrigation systems.⁴

The indigenous vegetables have been part of the food systems in the EAC for generations. They are the most affordable source of vitamins and minerals required for good health. The traditional fruits and vegetables found in many parts of East Africa have significant medicinal and curative potential.⁵ The F&V sector has a significant role in promoting the EAC industrialization agenda. The market for processed fruits in the EAC, is among the most promising, with sector maturity still far off into the foreseeable future.⁶

Opportunities in the EAC F&V sub-sector

Opportunities abound in the F&V sector, particularly on the trade front. The EAC produces a wide range of F&Vs, which can be exported to regional and international markets. The volume of EAC trade in the global F&Vs market is estimated at around 1.28 million tons per year. The proportion of fresh exports is 86.82%. Processed exports account for the remaining 13.18%. Overall, F&V exports increased by a Compounded Annual Growth Rate of 15% between 2006 and 2016. Vegetable exports have registered more growth at CAGR 16% compared to 15% for fruits.

The European Union accounts for the largest share (49%) of F&Vs imported from EAC to the global markets. East Asia provides a significant market share (34%) for EAC products and the Sub-Saharan market is also a prominent market player (12%). The trade in F&Vs between EAC and the European Union, is estimated at 187.23 thousand tons per year and valued at around 401 million Euro. Vegetables and edible fruits account for 95.00 and 91.32 thousand tons respectively, with the proportion of processed and fresh exports is around 37.95% and 62.02% respectively. The major F&V products exported to the EU are beans, followed by avocados and pineapples. Other important exports are brassica vegetables, peas, pepper, and leguminous vegetables.⁷

In addition, the F&V sector provides significant opportunities for processing and value addition, which can subsequently promote backward linkages - currently lacking. Investment in F&V processing can also promote vertical integration. Lack of vertical integration is a common feature in East African industries in

¹ COLEACP Market Study, 2019

² FAO 2008

³ World Bank, 2008

⁴ Ulrich, A. (2014). Export-Oriented Horticultural Production in Laikipia, Kenya: Assessing the Implications for Rural Livelihoods. Sustainability, issue 6(1), pp. 336-347

⁵ Evidence Based Complementary and Alternative Medicine, Volume 2015 ID 807158

⁶ EAC Industrialization Strategy (2012 – 2032)

⁷ COLEACP Market Study, 2019

almost all sectors. In the F&V sector, this feature is quite significant in almost all Partner States, due to the prevailing initial development process of industrialization in the region. Most of the factories are either established to substitute imports of processed fruit juice to increase value addition to raw materials without considering the inter dependence of various segments of the sector.

Challenges in the EAC F&V sub-sector

Despite the above potential, there are several challenges which inhibit the EAC from optimizing the opportunities in the sector, and thereby promote growth and competitiveness. The F&V production base across the EAC is fragmented, smallholder dominated, and with low yield per acre, as well as low productivity. The input manufacturing activities are relatively underdeveloped, with limited involvement of the private sector.⁸ There insignificant pre- and post-harvest losses - depending on the situation and the crop in question, the post-harvest loss may reach 35-60%. The F&V sector suffers from limited processing technologies for value addition. Given the fragmented nature of small-scale producers, the preservation of F&Vs is often difficult, as the raw material base is very expensive.

The packaging activities for the F&V subsector are relatively underdeveloped, the sector has not attracted significant private sector investments. The sector is also characterized by the existence of relatively small formal marketing channels in parallel to a large informal one. As such, there are no adequate linkage between the small-scale production sector and those of large commercial activities. The industry lacks coordinated efforts to expand the market share at the domestic, regional, and international levels. Market information within the F&V sector is not well integrated with other information systems – public and private. For this reason, information is not reaching the masses and at times the information is also not very useful. Furthermore, the capacity of smallholders is limiting in terms of access and use. The inability of the EAC region to guarantee a consistent and continuous domestic supply of fresh F&Vs is also a challenge. It has been argued that the need for markets to be consistently supplied with quality fruits is the reason for the lack of growth and local consumption in the fruit and vegetable supply chain.

There is limited use of Research and Development (R&D) within the EAC fruit and vegetable sector. In general, there are no “targeted” technology-based R&D efforts, which could increase the competitiveness of the sector. This is particularly the case for the small and medium-scale processing entities. In most cases, the cost of technology is high and therefore not affordable to processors and sometimes the available technology is not relevant to small and medium-scale processors. In addition, efficient and cost-effective dissemination systems for technology are still lacking. R&D efforts in the sector have not been targeted to developing: the latest processing technologies; good packing technology and packaging materials; innovative technology and relevant technologies for after-sales services.

There are limited services in the F&V value chain. Services play an important role in global value chains (GVCs) and in particular, the manufacturing processes (often referred to as “servicefication”) which creates an increasing share of value-addition. Partner States and companies that are unable to access well-priced and good quality services domestically, or from abroad, will find it difficult to participate in regional or global value chains.

The logistics and transportation infrastructure also have challenges, in particular, the post handling systems in the transport infrastructure (railways, posts, airfreight services) do not necessarily cater to the needs of perishable F&Vs – e.g., cold storage facilities, cold rooms for transit goods, and “green” belts to fast-track clearance at the ports. This leads to long delays in clearing goods on transit and therefore to more post-harvest losses. It also affects the speed at which products get to the market.

Although the EAC is operating within a common market, national regulations are not harmonized across the region. Efforts to harmonize national regulations across the EAC region have the potential to increase the competitiveness of the F&V subsector. Furthermore, there are no policies or directives specific F&V sector at the regional level.

There are several challenges related to quality infrastructure for the F&V sector in the EAC region, the set-up of the quality infrastructure institutions has not provided for the International Plant Protection Convention (IPPC) central contact point. One

⁸ ibid

reason for having the IPPC Contact Point, is for the country to keep notification documents, supporting information, and associated records for at least one year after the date of notification. There is currently no designated institution at the EAC regional level, mandated for food safety controls although, at the national level, each EAC member country has its food control system. Food safety chemical and microbiological laboratories are currently limited in number and performance in most EAC member countries. In particular, the EAC Partner States have not outlined or specified such laboratories for food control purposes. Although standards and Technical Regulations are available within the EAC, many of which are harmonized, the participation of the private sector in Standards Committees is limited. The certification and guarantee systems in the EAC are generally weak, while the number of management and food safety standards adopted in the fresh F&V industry is very large. These mostly widely applied standards for F&V packaging and processing include HACCP, ISO 9000, and BRC Global Standard.⁹

To counter the above challenges, the EAC Fruits and Vegetables Value Chain Strategy and Action Plan propose eight (8) strategies as follows:

1. Increase production capacity for fresh and processed F&Vs
2. Strengthen R&D, innovation, and processing technologies
3. Develop and improve packaging services
4. Promote market access and trade facilitation
5. Improve safety and quality infrastructure
6. Build local skills and knowledge base
7. Strengthen the coordination, institutional and policy framework
8. Promote nutritional and medicinal indigenous fruits and vegetables

Development outcomes/targets for the sector (10-year timeline)

1. Increase the area under fruits production in the EAC by 5 percent to 10 million hectares, accompanied by 4 percent increase in productivity.

2. Vegetable production in the EAC to increase by 5 percent of area cultivated to 45 million hectares, from the current 32.8 million hectares with productivity increasing by at least 3 percent.
3. Intra-EAC trade in fruits and vegetable products increases from the current USD 9.9 million to 25 million in 2031.
4. Exports to the global market for the vegetable increase to USD950million from the current USD 416 million.
5. Exports to the global market for fruits to increase to USD350million from the current USD 125 million.
6. Employment opportunities were created along the value chain to the tune of 4,000,000 direct jobs, at the end of 2031.
7. Reduction in post-harvest losses from the current 40% to 20% in 2031.
8. Increase in the proportion of processed fruits from the current 8% to 16% in 2031.
9. SME entrepreneurs trained and supported, particularly in improving productivity, quality standards linking to the global supply chain.
10. Increase GDP contribution by fruits and vegetables from the current 36 percent to 50 percent in 2031.

Implementation budget

The successful implementation of the EAC Regional Fruit and Vegetables Value Chain Strategy and Action Plan (EAC-RF&VSAP) is estimated at **USD 18.29** million for the first period (2021–2024). Based on these estimates, the total budgetary requirement for the implementation of the 2021–2031 plan amounts to **62.00 million**.¹⁰

Quick wins

To jumpstart this Strategy, the EAC needs to implement the selective set of "quick-win" activities which are estimated to cost around **USD 11,140,000**.¹¹ It is hoped that these initial activities will create momentum for the subsequent implementations throughout the Strategy period.

⁹ There are several enterprises providing training in Food Safety Management systems as well as Good Agricultural Practices.

¹⁰ See Annex 1, p. 94

¹¹ See Table 18, p. 71



Chapter 1

Introduction

This document presents an East African Fruits and Vegetables Strategy and Action Plan 2021-2031. The Strategy and Action Plan were developed as part of the implementation of the recommendations made in the EAC Agro-Processing Value Chain Study conducted in 2015 and the subsequent directives of the Sectoral Council on Trade Industry Finance and Investment (SCTIFI). The directives required the EAC Secretariat to prepare a detailed Strategy and Action Plan for the implementation of the study recommendations.¹²

It is in this regard, that the EAC requested technical assistance from the GFA Consulting Group under the project "Support to Regional Industrial Value Addition (RIVA)". The project is being implemented on behalf of the GIZ project under "Support to East African Market Driven and People-Centred Integration (SEAMPEC)". The program, to support the development of the Strategy and Action Plan.

¹² The value chain study recommended for the development of F&V strategy, facilitation of local value addition and development of food safety and quality control standards in the value chains, among other measures.



Chapter 2

Background and Conceptual Framework

2.1 Rationale

The development of the East African Fruits and Vegetables Value Chain Strategy and Action Plan 2021-2031 is part of ongoing initiatives to implement the objectives and deliberations contained in the key regional policies and strategies, namely: the EAC Industrialization Policy and Strategy; the 5th EAC Development Strategy, and; the EAC Agriculture and Food Security Strategy and Action Plan. These are briefly highlighted below.

2.1.1 EAC Industrialization Policy and Strategy (2012-2032)

The EAC Industrialization Policy aims to transform the manufacturing sector in the EAC through higher value addition and product diversification, based on the comparative and competitive advantages of the region. The overall objective of the East African Industrialization Policy (2012-2032) is to enhance industrial production and productivity and to accelerate the structural transformation of economies of the EAC region to enable sustainable wealth creation, improved incomes, and a higher standard of living for the Community.

2.1.2 The 5th EAC Development Strategy

The 5th Development Strategy for the East African Community, for the period 2016/17-2020/21 is the first regional Development Strategy under the EAC Vision 2050. It outlines the broad strategic development objectives that the Community will pursue in line with the Treaty for the Establishment of the East African Community and the EAC Vision 2050. Formulation of the Strategy considered the obligations of the Community within the development frameworks at intra- and inter-regional, continental, and global levels (EAC Partner States, COMESA, SADC, AU Agenda 2063, and the Post-2015 UN Development Agenda).

It is important to note that the EAC has initiated a process of developing the 6th Development Strategy that also prioritizes agricultural and industrial development.

2.1.3 East African Community Food and Nutrition Security Action Plan (2019-2024)

The goal of the EAC Food and Nutrition Security Action Plan (FNSAP) 2018-2022 is to contribute to the elimination of hunger, malnutrition, and extreme poverty in the East African region by the year 2022. This will be achieved through three interrelated objectives and six intermediate result areas as follows:

- To improve sustainable and inclusive agricultural production, productivity, and trade of crops, animal and animal resources, fisheries, aquaculture, apiculture, and forest products.
- To strengthen resilience among households, communities, and livelihood systems by promoting sustainable utilization of natural resources, environmental conservation, and uptake of disaster risk reduction with enhanced post-harvest value addition.
- To improve access and utilization of nutritious, diverse, and safe food through increased investment in nutrition.

2.2 Role of the F&V Sub-Sector in Promoting the Agriculture Agenda of the EAC

Agriculture is one of the most important sectors in East Africa, with about 80 percent of the population of the region living in rural areas and depending on the sector for their livelihood. The sector is also an important source of employment for the urban population. Agriculture plays a key role in economic growth, poverty reduction, food security, and employment. The agriculture sector contributes between 24 and 44% of GDP in the five Partner States. As a key driver for the East African economies, it can therefore contribute towards major regional priorities, such as eradicating poverty and hunger, boosting intra-regional trade and investments, rapid industrialization and economic diversification, sustainable resource and environmental management, and creating jobs,

human security and shared prosperity.¹³ Agriculture is also important for promoting food security. Countries in the East African Community are facing significant food security challenges, as of February 2017, approximately 6.5 million people in the East African Community faced food security crisis.¹⁴

Fruits and vegetable production provides a promising economic opportunity for reducing rural poverty and unemployment in the EAC, it is also a key component in farm diversification strategies. The F&V subsector is increasingly recognized as essential for food and nutrition security. Fruits and vegetables play an important role in providing essential vitamins, minerals, and dietary fibre to the EAC population. These are key components of good health. The indigenous vegetables have been part of EAC food systems for generations, they are the most affordable source of the vitamins and minerals needed for good health. The region is a natural habitat for more than 45,000 species of plants, of which about 1,000 can be eaten as green leafy vegetables or fruit, which happen to be the mainstay of traditional diets.¹⁵ The traditional fruits and vegetables found in many parts of East Africa have significant medicinal and curative potential.¹⁶

The F&V sector provides significant opportunities for processing and value addition, which can subsequently promote backward linkages, that are currently lacking. In particular, the fruit juice subsector generally lacks strong backward linkages, partly due to the absence of organized marketing systems. Poor backward linkages are attributed to several factors, including poor access to raw materials, sustained capital investment, degree of vertical integration, and human resources.

Investment in F&V processing can also promote vertical integration. Lack of vertical integration is a common feature in East African industries in almost all sectors. In the F&V sector, this feature is quite significant in almost all Member States, due to the

prevailing initial development process of industrialization in the region. Most of the factories are either established to substitute imports of processed fruit juice to increase value addition to raw materials without considering the interdependence of various segments of the sector starting from fresh fruits up to the final product.

2.3 Role of the F&V Sub-Sector in Promoting the Industrialization Agenda

Under the EAC Industrialization Policy and Strategy 2012-2032, the F&V sector was earmarked for development as part of the broader agro-processing sector. In particular, processed fruits remain prominent on the agenda and therefore warrant the effort to address information asymmetries, which hamper growth in investment as well as intra-EAC exports. The processed fruits market in the EAC is among the most promising, with sector maturity still some way off into the future.¹⁷

The share of F&V in manufacturing is very small (4 to 12 percent), as is the manufacturing value-added per capita, this is dominated by foods and beverages, and offers the opportunity for a stronger effect on sector competitiveness, employment, and value addition. F&V products export trade flows, indicating the potential for intra-regional trade in processed products, are also low in terms of the value of key products compared to overall exports from EAC to the Rest of the World.

The current capacity for agro-processing of F&V varies in terms of industry concentration, level of actors, technology, and development. The sub-sector scores the highest total attractiveness of 8.21 and the highest total strategic feasibility of 6.82, and a relatively high Local Value-Added Content (LVAC), despite significant challenges such as high post-harvest waste of up to 40 percent (with only about 8 percent being processed).¹⁸

¹³ The value chain study recommended for the development of F&V strategy, facilitation of local value addition and development of food safety and quality control standards in the value chains, among other measures; East African Community Secretariat 2018

¹⁴ East African Business Council, 2018

¹⁵ International Journal of Agricultural Sustainability

¹⁶ Evidence Based Complementary and Alternative Medicine, Volume 2015 ID 807158

¹⁷ EAC Industrialization Strategy (2012 – 2032)

¹⁸ ITC (2016). Investment Profile, Agro-processing and light manufacturing in the EAC



Chapter 3

The Approach

The methodology for developing the Strategy and Action Plan involved a combination of desk reviews and extensive stakeholder consultation. As part of the secondary literature review, efforts were made to collect relevant information at Partner State and regional level, including sector policies and strategies; existing studies conducted at national and regional levels as well as other relevant industry documents and literature.

Findings from the secondary literature review were complemented by international literature to incorporate lessons learned from international best practice. As part of this exercise, specific best cases of small- to medium-scale F&V agro-processing enterprises in each Partner State were selected and analysed. All information collected from secondary sources was synthesized and summarized to delineate their strategic implications to the assignment.

To complement the findings of the literature review, key stakeholders were consulted in order to assess the dynamics on the ground, as well as validating some of the findings. This included information from

the Partner States and in-depth expert interviews. This information was collected by respective National Focal Persons. Field interviews were collected using a Questionnaire Guide.

Information from field interviews and secondary literature were subsequently grouped, synthesized and key findings clustered into their respective thematic areas. The collected information was used to prepare national reports, which were ultimately consolidated into the regional F&V Strategy and Action Plan.

To promote buy-in and ownership from the stakeholders, the Consultants facilitated relevant meetings at appropriate stages. These included: an inception meeting, national consultative meetings, and a regional validation meeting.

A team of consultants comprising: A regional Lead Consultant, a Quality Infrastructure Expert, and National Focal Persons from all EAC Partner States, was mobilised.



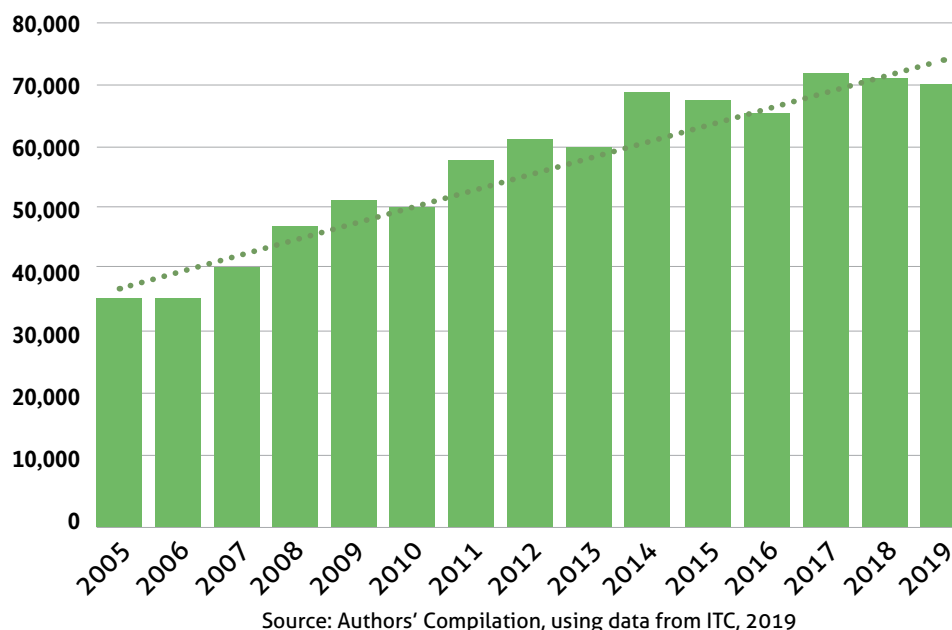
Chapter 4

Situational Analysis of the F&V Sub-Sector

4.1 An Overview of Global Trends

Global demand for vegetables has increased significantly over the past 15 years. The value of exports has increased from 39 million USD in 2005 to almost 80 million USD in 2019. The European market is a good example, demonstrating the growing importance of fruits and vegetables, they are one of the most important categories in European supermarkets today. A wide range of fresh products are imported into Europe from developing countries: Exotic, more expensive fruit that has become more popular with European consumers in recent years, such as blueberries, avocados, mangoes, and pomegranates, all helped push these values higher. Besides a large number of bananas, they also import out-of-season products (e.g. green beans).¹⁹

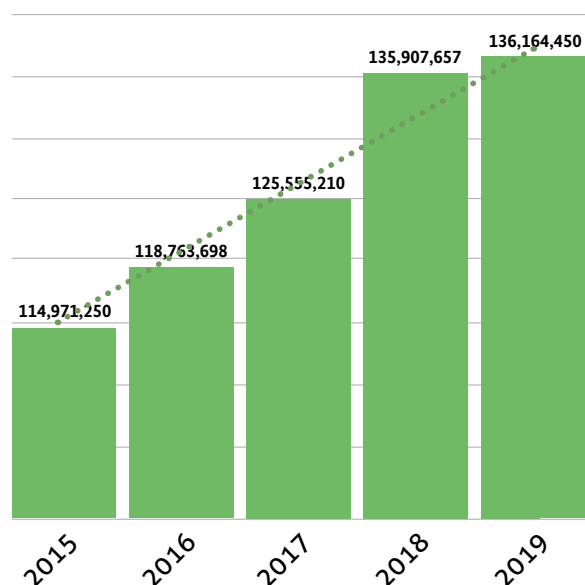
Figure 1: World vegetable imports (USD thousand)



Analysis of time series data shows an overall increase in the global consumption of edible fruits. This trend is represented by the growth in total export value for these products over the past five years. On average, the cumulative growth is estimated at 4%.

¹⁹ CBI, the Centre for the Promotion of Imports from developing countries, Ministry of Foreign Affairs, Netherlands, 2019

Figure 2: World edible fruits imports (USD 000)



Source: Authors' Compilation, using data from ITC, 2019

4.1.1 Demand for processed fruits and vegetables

(a) Fruit and vegetable juices²⁰

The global fruit juice market reached a volume of 46.3 billion litres in 2019, registering a CAGR of 1.8% during 2014-2019. The market is expected to witness stable growth during the next five years.²¹ The global fruit and vegetable juice market is projected to reach USD 173 billion by 2024, growing at an estimated CAGR of 3.17% during the forecast period. Growth in the fruit and vegetable juice market is driven by increasing demand for healthy food from an increasingly health-conscious consumer base.²²

On a geographical front, Europe enjoys the leading position in the global fruit juice market. The fast-paced modern lifestyle and high-income levels of the consumers in the region has led to a rise in demand for on-the-go fruit juices. Europe is followed by North America, Asia Pacific, Latin America, and the Middle East and Africa.

The Middle East and Africa is the fastest-growing region of the global market for fruit and vegetable juices. The current average per capita consumption of fruit and vegetable juices in the Middle East and Africa region is comparatively lower than that of the developed regions, but is increasing at a quick pace. Education play an important role in determining the health status of consumers in this region, a shift towards healthier fruit and vegetable juices instead of carbonated energy drinks is surfacing in the region. One of the potential reasons for the growth of this market in South Africa, is the government's awareness campaign which is focused on orienting consumers toward healthier food consumption habits. The fruit and vegetable juice market in Saudi Arabia has benefited from excise taxes imposed on carbonated and energy drinks in 2017. People above the age of 45 prefer juices with no added sugar, 100% juice content, and vitamins and minerals.

The growing popularity of cold-pressed juices is one of the key segments influencing the growth of the juice market across the world. Cold-pressed juices preserve the vitamins, minerals and enzymes that are lost during the heating and oxidizing phases of the traditional fruit juicing processes. Very few consumers are aware of the benefits of fruit and vegetable mixed juices, particularly in developing countries.²³

²⁰ Fruit juice refers to a non-fermented beverage which is obtained by mechanically squeezing or macerating fruits. Different types of fruit juice offer varied health benefits, for instance, avocado juice boosts natural energy in the body; watermelon juice keeps the body hydrated and improves metabolism; papaya juice caters healthy digestion; lemon juice fights viral infections, and pineapple juice reduces cholesterol levels. This, coupled with the refreshing taste and longer shelf-life of fruit juice, makes it one of the most widely consumed beverages across the globe.

²¹ Fruit Juice Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2020-2025

²² Reportlinker.com "Global Fruit and Vegetable Juice Market - Growth, Trends and Forecast, (2019-2024)

²³ This has forced vendors of mixed juices in such markets to come up with marketing and advertising activities to increase consumer awareness about the benefits of mixed juice products.

Fruit juices fortified with functional ingredients offer new product opportunities to companies that can develop and market functional fruit juice products by understanding consumer preferences to meet consumer expectations. Omega-3, fibre, bioactive compounds, vitamins, and probiotic bacteria are some of the functional ingredients that offer immense product opportunities for the juice industry. Vitamins are added to fruit juices to increase the nutritional profile of fruit juice products. Vitamin D, vitamin E, vitamin A, and vitamin C are some of the popular vitamins added to fruit juices. Various government initiatives are being undertaken across the globe to increase the consumption of fortified food and beverages, particularly in developing countries such as China and India.²⁴

(b) Vegetable concentrates

The global vegetable concentrates market is expected to grow significantly in the next decade. The market is expected to register a CAGR of 4.50% between 2020 and 2025. This rise in market value can be attributed to the increased preferences for ready-to-eat food products and the rising number of restaurants and hotels in developing countries.

Vegetable concentrates are most widely used in soups, sauces, and puree, vegetables-based foods, vegetable-based baked, and confectionery goods, such as vegetable patties, and vegetable-based mixtures. With the increase in the hectic lifestyle of the people around the world, vegetable concentrates can be added as a substitute for natural vegetables thereby, cutting the cooking time of the consumers, which in turn boosting the market.²⁵

Studies on consumption patterns across the globe have shown an increased demand for "Ready-to-Eat Foods". The factors, such as increased demand for ready-to-eat foods, usage as a substitute for vegetables because of the paucity of time with the new age professionals and increase in the opening of hotels and restaurants in the developing economies, are increasing the applicability of the vegetable concentrates in the global market. Furthermore, the increase of use of fruit and vegetable concentrate as a healthy additive, is adding to the popularity and increased consumption among athletes, sportspersons, and youth at a fast pace. Tanzania can use these emerging market trends as an opportunity for promoting trade and investment. The demand for these products is significant, and contribution to industrialization is huge.²⁶

According to Data Bridge Market Research, the fruit and vegetable concentrate market is witnessing significant growth in developing economies during the forecast period of 2020-2027 due to factors such as rising demand for convenience foods, rising initiatives to promote healthy activities, changing consumer lifestyle along with rising demand of natural ingredients, all of which will help boost the growth of the market.

Increasing initiatives by the governments in promoting healthy activities, the rising popularity of convenience food, surging number of international trade along with rising demand for natural ingredients and changing consumer lifestyle, is likely to enhance the growth of the fruit and vegetable concentrates market in the forecast period of 2020-2027. On the other hand, rising applications in emerging markets and rising preferences towards healthier alternatives will further boost various opportunities that will lead to the growth of the fruit and vegetable concentrates market in the above-mentioned forecast period.

(c) Organic pulps and purees

Pulps and purees are the foodstuffs made from the various vegetables or fruits by several processes such as blending, pressing, or sieving. These ready cooked, processed and heat-and-eat products are mainly prepared from strawberries, apples, peaches, and so on. Fruit pulp and purees are processed fruit products that are helpful in the preparation of various food, beverages, cosmetics, and other products. Pulps and purees are used for making jams, marmalades, jellies, sweets, drinks, and fillings of baked goods.

The market for organic pulps and purees is estimated at around USD 2,248 million in 2019 and is projected to reach up to USD 3,500 million in 2026, with a Compound Annual Growth Rate of 6.5%, over the forecast period (2020-2026). The production of organic groceries has been on the rise over recent years as the consumer demand for organic food has risen dramatically on the backdrop of a series of high-profile scares about food

²⁴ *ibid*

²⁵ <https://www.mordorintelligence.com/industry-reports/vegetable-concentrates-market>

²⁶ The vegetable concentrates market is segmented by product type, application, and geography. Based on product type, the market is segmented into pastes and purees, pieces and powder. Based on application, the market is segmented into beverage, confectionery, bakery products, soups and sauces, and other applications.

safety.²⁷ In recent years, consumer inclination towards organic pulp and purees has increased considerably, due to continuous urbanization, growth of nuclear families, and the rapid rise in dual-income households, as well as the growing awareness about the health benefits associated with organic food products worldwide. Due to the absence of synthetic and chemical fertilizers, organic food does not cause any health-related issues.

Organic pulp and purees are particularly used in infant food as they have numerous health benefits. The adoption of organic pulp and purees in infant food is rising at a faster rate which is likely to boost the market growth of organic purees over the forecast period. The rapid rise in dual-income households and growing disposable income is driving the growth of the global organic pulp and purees market. In recent years, there has been a notable growth in dual-income households. The main factor in this increase has been the successful efforts of the government and firms in promoting female labour force participation in a tight labour market. An increase in the number of working women, due to changing lifestyles and urbanization, resulted in superior demand for baby food products. Stringent government regulations and guidelines on chemicals and artificial ingredients application in several food products will provide a strong outlook for organic pulp and purees market expansion.²⁸

The organic pulp and purees market is segmented into fruits and vegetables. The fruits segment dominates the organic pulp and purees market owing to its use as baby food, as the taste, consistency, and nutritional aspects of fruit pulps are a suitable food for infants.²⁹ It is envisaged that the growing demand for fruit pulp in baby food and organic food products will boost revenue growth of the global fruit pulp market.

The main fruit family types on the global fruit pulp market include berry fruits, exotic fruits, and orchard fruits. Berry fruits include blueberry and strawberry, while exotic fruits are the likes of mango, papaya, apple, guava, passion fruit, and pineapple. Orchard fruits include peach, kiwi, and pear. Most of these types of fruits are used as pulp in baby food, as the taste and consistency of fruit pulp is suitable as infant food. This is driving the popularity of fruit pulp and consequently boosting revenue growth of the global fruit pulp market. Of these fruit family types, the exotic fruit segment is expected to be the largest in terms of revenue, reaching an excess of USD 600 million in 2017. In terms of volume consumption, the exotic fruit segment reached 675,280 MT in 2017. With an estimated 57% market share in 2025, the exotic fruit segment is anticipated to lead the global fruit pulp market throughout the forecast period.

4.1.2 Consumption Patterns

The global food economy has changed substantially within the last decade, leaning more towards high-value agriculture (HVA),³⁰ which are non-traditional food crops such as vegetables, fruits, flowers, houseplants and foliage, condiments, and spices. In recent years, there has been a big shift from massive consumption of traditional foods to more consumption of fruits, vegetables, and other high-value products, including processed foods. As a result, global fresh fruit and vegetable imports have been growing at more than 5% annually since 2010, driven by double-digit growth in demand from China, India, and the Middle East.³¹ Globally, HVA is the fastest-growing segment of the agricultural value chain. Because of these developments, agriculture is diversifying towards high-value food commodities and the food marketing system is moving towards vertical coordination. This trend suggests a “value opportunity” for F&Vs from the global perspective.

Empirical evidence suggests that HVA products are the fastest-growing components of international agricultural trade. For example, the export value (about all agricultural exported crops) of traditional tropical products, like coffee, cacao, tea, and sugar from developing countries, fell from 40% to 19% between 2000 and 2015. In the same period, the export value of horticultural products from developing countries increased from 16% to 21%. Further analysis shows that between 2015 and 2019, the total export value for HVA³² grew much faster than that of traditional exports.³³ Their Cumulative Average Growth Rates (CAGR) are 4% and 1% respectively. This is a further testimony of the growing dominance of HVA in the global agriculture commodity trade.

²⁷ The processes used in production of organic pulp and purees prohibit the use of chemicals such as herbicides, synthetic fertilizers, antibiotics, and hormones, among others. Instead, organic production purely involves the combination of best environment practices, a high level of biodiversity and the application of high animal welfare standards.

²⁸ Infinium Global Research Analysis, 2019

²⁹ <https://www.infiniumglobalresearch.com>

³⁰ High value crops refer to non-traditional food crops such as vegetables, fruits, flowers, houseplants and foliage, condiments and spices.

³¹ ITC, Trade Map

³² Commodities included in this analysis are: vegetables, fruits, spices and herbs

³³ Traditional exports included in the analysis are coffee, cocoa, cereals, sugar and tea

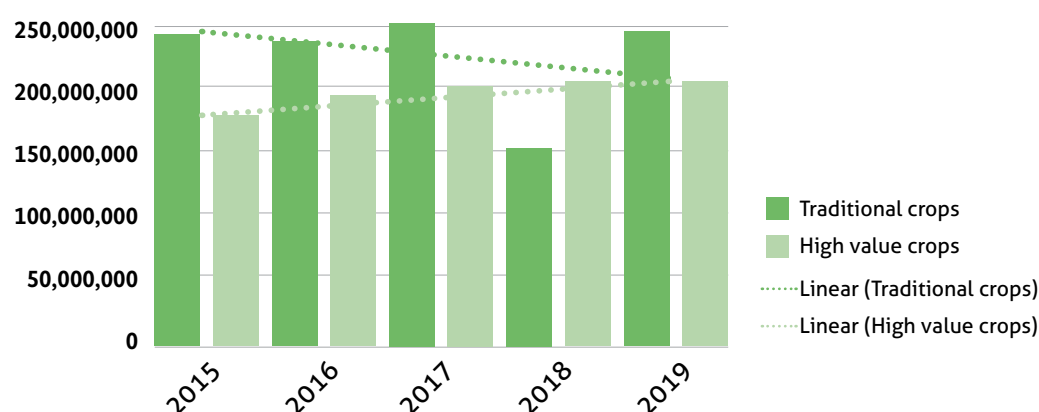
Table 1: Comparison between traditional and high value crop export values (000'USD)

Product	2015	2016	2017	2018	2019	GAGR
Traditional crops	240,644,049	237,784,551	253,060,986	152,724,569	246,493,703	1%
High value crops	176,281,181	186,986,289	199,447,337	205,186,224	203,282,159	4%

NB: High-value commodities included in this analysis are: non-indigenous vegetables, fruits, spices, and herbs. Traditional exports included are coffee, cocoa, cereals, sugar, and tea

Source: Authors' Compilation, using data from ITC, 2019

The above trend is further depicted in the figure below.

Figure 3: Global trends in export value for traditional and high-value crops

Source: Authors' Compilation, using data from ITC, 2019

The above analysis implies that HVA has moved from a "niche" phenomenon to the "mass" market. Furthermore, horticulture is now the "real driver" of the growth of agricultural exports.

The key drivers of increased consumption of fruit, vegetables, and other high-value products are:

- Altered consumer preferences and growing health awareness both at the global level and in developing countries.
- Growing demand for high-value agricultural products within developing countries
- The restructuring of food marketing channels. This is affecting the industrialized as well as the developing countries markets
- HVA commodities have a higher gross margin per unit of available resources (land, labour, capital, human capacity) than other products within a given location and context

4.2 African Context

Fruits and vegetables are a significant component of agricultural farming systems in Africa and have recently moved into the focus of research organizations, development partners, and policymakers. Beyond income-generating opportunities for producers, F&V production for domestic and export markets is an important driver for growth, due to employment opportunities in production, processing and trade. It is estimated that most of the F&V produced in Africa is from the Sub-Saharan region.³⁴

Fruits and vegetable exports from Sub-Saharan Africa have grown significantly over the past 15 years. Overall, trade volume has increased by double digits in the major markets. Most of the trade expansion has happened within the SSA region itself, where trade volumes have increased by a compounded annual growth rate (CAGR) of 12%. The East Asian market has also grown substantially at CAGR 10.1%. This is considered as an emerging market.

³⁴ CABI, Annual Review, 2019

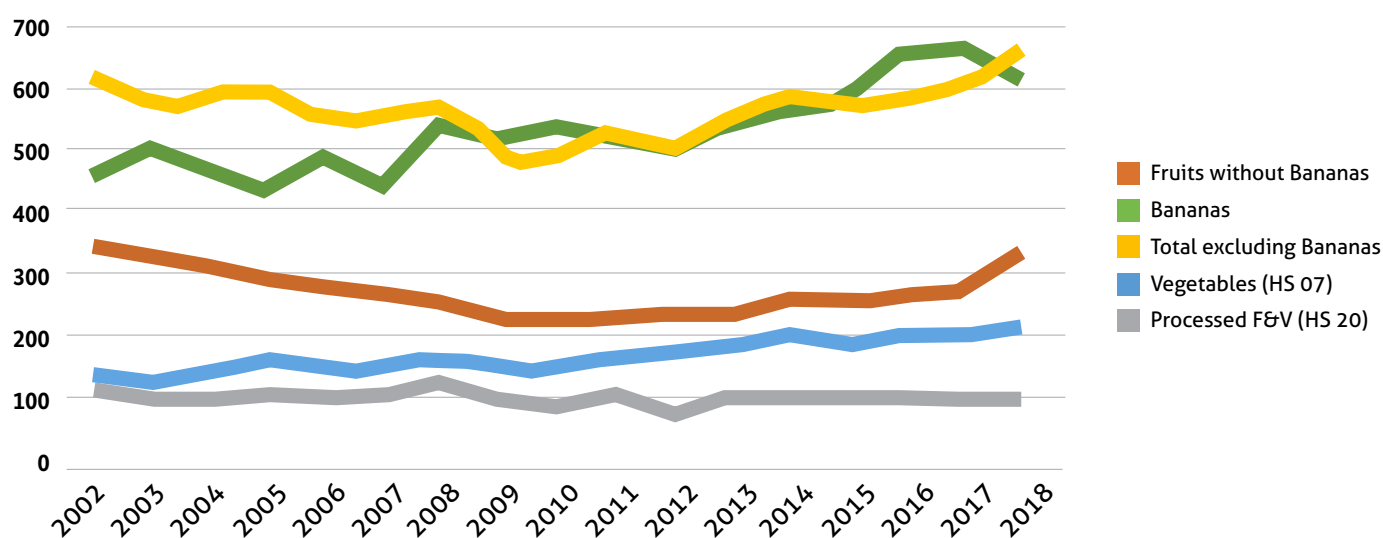
Table 2: Market expansion rate for SSA fruit and vegetables

Market segment	Compounded Annual Growth Rate (CAGR)
Sub-Saharan Africa to Sub-Saharan Africa	12.0%
Sub-Saharan Africa to East Asia	10.1%
Sub-Saharan Africa to European Union	1.7%

Source: COLEACP database, 2019

Trade with the European Union has also expanded, although not at the same levels as other markets, however, this traditional market remains attractive for products from Sub-Saharan Africa.

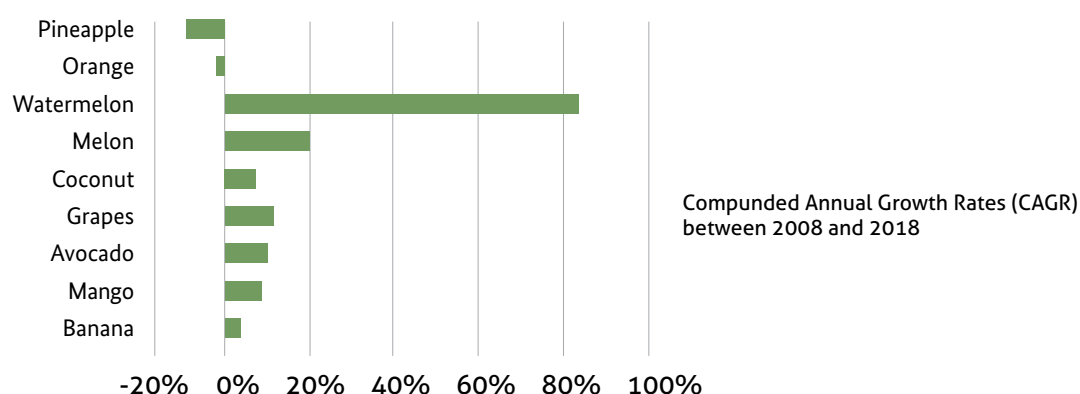
Figure 4: Sub-Saharan Africa's trade in fruits and vegetables with the EU (000" tons)



Source: COLEACP market study, 2019

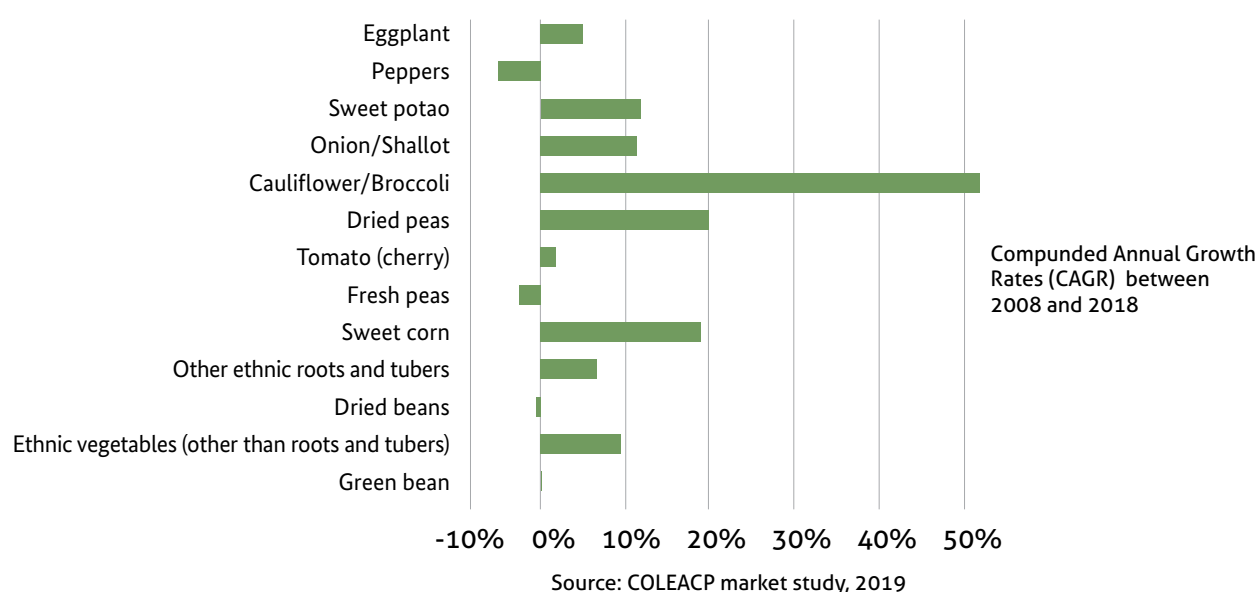
Watermelon, melon, grapes, avocados, mangoes, coconuts, and to some little extent bananas are the edible fruit products in most demand from SSA. A comparative analysis of growth rates for major exported fruit products is presented below.

Figure 5: Main fruits exported from SSA to the European Union



The figure below presents the vegetable products most in demand by the European Union from SSA, including the magnitudes of their respective growth rates between 2008 and 2018.

Figure 6: Main vegetable exported from SSA to the European Union



4.3 Status of the F&V Sector in the EAC Region

This section presents an assessment of the F&V sector in the EAC region. It first presents the overall status of the sector in the region, in which key drivers of competitiveness are examined. These include production and productivity trends; technological trends and developments; status of investment in the sector; policies, regulations, and institutional framework. This assessment also presents an overview of trade performance in specific market segments, including the global fresh and processed F&V markets; trade between EAC and the European Union and the intra-regional trade. Lastly, an assessment of the F&V sector in the individual partner States is presented.

4.3.1 Economic importance of the F&V sector

The fruits and vegetable sector plays a significant role in the EAC economies. This sector represents 20-36 percent of the Agriculture GDP on average and contributes a large share of employment opportunities. There are significant employment opportunities in the horticulture sector across the EAC countries, in Tanzania, for example, the horticulture sub-sector employs about 2.5 million people, which makes the industry a major employer within the agriculture sector.³⁵ In Uganda, although exact figures are lacking, it is obvious that the horticulture industry generates a significant number of jobs. Approximately 3,000 small-scale farmers grow fresh fruits and vegetables for export, and many more smallholders base their livelihoods on the production of fruits and vegetables for the domestic, regional, and international markets. In addition, the input supply, transport, marketing, packaging, and handling operations offer other job opportunities.³⁶

The fruit and vegetable sub-sector in the EAC region can significantly influence the economy of the region due to the following features:

- The market prospects are very high (short and long-term), global demand is steadily growing and the horticulture sub-sector has already established well-functioning internationally operating supply chains in some Partner States;
- The potential for value addition is very high (relatively little processing is required to achieve significantly higher prices and reduce losses);
- Due to its labour intensity, the employment potential and the political interest is high;
- Negative environmental effects are relatively low;

³⁵ Embassy of the Royal Kingdom of Netherlands (2017): Mapping of the Production of Fruits and Vegetables in Tanzania, Match-Makers Associates.

³⁶ *ibid*

- The sector can have a very positive impact on poverty reduction and food security;
- Due to a very high proportion of informal trade, the potential for improving formal trade is also high, both nationally and regionally;
- Vertical regional integration can significantly improve the competitive advantage of the EAC region on international markets;
- The fruits & vegetable sub-sector is very diverse, with several individual value chains which have a very high potential for quick-wins;
- Various national policies, strategies, and sector-specific regulations are already in place in the EAC Partner States and require regional harmonization.

Production and productivity trends

The EAC produces a wide range of vegetables, including various unique Asian vegetables, baby corn, baby marrow, beetroots, beans, cabbage, carrots and baby carrots, cauliflower, eggplant, kale, leeks, onions, shallots, okra, peas, potatoes, spinach, and tomatoes to name a few. A wide range of fruit is cultivated, albeit at differing levels of intensity. These include tropical fruits like citrus, mangoes, pineapples, avocado, jackfruit, and guavas, but also those suited to temperate climates (the highlands) such as apples, pears, peaches, plums, blackberries, and strawberries. Fruit production is generally associated with perennial crops, which require longer periods before they can be harvested.³⁷

Production activities are conducted by both commercial and subsistence farmers. At small-scale farmer level, fruits and vegetables are produced in small amounts simultaneously and are dependent on the season. In contrast, the large commercial entities use irrigation systems and other modern agronomical methods, to expand their operations, thereby extending the seasonality orientation of the sector. Vegetable production has relatively lower entry barriers, but does require significant investment, such as irrigation systems. In the export-oriented production of fruits and vegetables, such as in Kenya, companies are strategically located close to airports; they have a fixed production capacity, fulfilling order-driven production targets for an established market; and activities at the various levels of the value chain are mostly supervised by or even owned by independent private companies.³⁸

Over the last 5 years, the area cultivated for fruits production in the EAC has modestly increased by 2 percent to 7.4 million hectares, with productivity and farm value of fruits produced over the same period declining by 4 percent to 28.8 million MT and declined by 12 percent to USD 8.5 Billion, as at end of 2018. Vegetable production in the EAC has insignificantly increased by 0.5 percent of area cultivated to 32.8 million hectares, with productivity marginally increasing by 1.1 percent to 59.5 million MT, and decreased farm value to USD 14.6 Billion.³⁹

Despite the data for current production volumes in all EAC countries being unavailable, the data that is available suggests that Uganda remains the largest producer of fresh fruits and vegetables in the EAC, producing an estimated 5.5 to 6.0 million metric tons per annum, up from approximately 1.1 million per annum in 2005. Kenya produced an estimated 2.83 million tons of fruits in 2012, growing to 3.1 million metric tons in 2013, 3.3 million metric tons in 2014, and reaching 3.4 million metric tons in 2015. Kenya has a planted acreage of fruits totalling approximately 162,000 Ha, compared to a total land size of approximately 630,000 Ha of horticulture. Tanzania produces 2.75 million tons but only 4% is processed.⁴⁰

Technological trends and developments

As a general rule, high-value crops should be sold fresh as often as possible, with minimum value addition. Fruits and vegetables are classified as high-value crops, which means that they already have an inherently high value as saleable products themselves. For such crops, the processing is often just a supplementary activity. Value addition for such products often consists of simple primary processing of cleaning, grading, and packing; and the increased utility of place, making it available close to consumers.

³⁷ GIZ/EAC, Agro-processing Value Chains, Final Report, February 2019

³⁸ *ibid*

³⁹ EAC Secretariat, 2019

⁴⁰ ATEAS, 2019

The vast majority of fruits and vegetables marketed within the EAC region are simply moved from farm to market, which is already a value-added activity. The export markets for fruits and vegetables are strongly based on selling primary processed produce, a fresh product that has been cleaned, graded, and packaged.

Therefore, the scope for value addition in the fruit and vegetable sector within EAC is high. If appropriate farming practices are undertaken, very little processing will be required to achieve significantly higher prices and reduce losses. Opportunities also exist for utilizing local and appropriate processing technologies (e.g. solar dryers) to increase the shelf-life of fruits and vegetables.

In addition to the above, the issues of value addition in the F&V subsector need to be looked at from a different angle. This is particularly critical, given the growing importance of processed fruits and vegetables in the global market. Currently, the processed fruits market in the EAC is among the most promising, although the industry is still at a nascent stage. Consequently, there is a need to improve technological innovation in this space, if EAC has to capture this premium market.

Status of investment in the F&V subsector

This section presents key trends in the resources invested in the F&V sub-sector. For this assignment, the resources are measured in terms of Foreign Direct Investment (FDI's). The objective of the analysis is to highlight key opportunities presented by the FDI inflow in the region.

Foreign Direct Investment is one of the measures for economic growth and economic transformation. The EAC Partner States have continued to promote investment opportunities to attract FDIs into the various priority sectors. The importance of FDI to EAC, is the injection of foreign capital, human capital, technology transfer, and increased productivity to promote a competitive domestic sector and provide important innovation and linkages with domestic firms.⁴¹ There is, therefore, a need for concerted government efforts to attract FDI into areas of high employment and productivity, such as the F&V subsector.

Although there are several private investments in agro-industry and related industries in the EAC region, reliable data on the magnitude and type of these investments at the country and regional level is not readily available. Nevertheless, Kilimo Trust⁴² (2013) mapped over 2,320 agro-industry registered enterprises in the EAC region. Of these enterprises, 67% manufacture food products, and more than half of these enterprises are concentrated in Kenya. Most of the food agro-processing enterprises are small to medium-scale enterprises⁴³ and mainly process coffee, maize, tea, and dairy.⁴⁴ A few large and multi-national companies like Delmonte, Britannia Allied Industries, Century Bottling Company (CBC), Sameer Agriculture Livestock Ltd (SALL); Meru millers, and Bakhresa, are still some of the biggest players in the F&V subsector.

The analysis presented in the previous sections, suggest increasing opportunities for investment in the fruit juice processing activities in the EAC. From a market entry perspective, the current business operators already invested in fruit juice processing, need to showcase their product range more through branding, re-branding and expanding their presence in regional supermarket retail chains. The EAC fruit juice market is increasing as a result of a growing population, growing economic output, and an expanding middle class.

The compounded annual growth rate (CAGR) of the processed fruit juice sectors in Tanzania, was estimated at 7%¹², Uganda⁴⁵ 12.8%, and Rwanda 6.8%. Mass grocery retail sales in Tanzania grew by 6% from 2014 to 2019. Despite stiff competition from local suppliers due to home-based advantage (managing fragmented production and distribution and also the dominance of local ownership of fruit juice production centres), opportunities for low-cost, high-quality products abound. These opportunities are observed for fruit-based jams, the manufacture of baby food, and fruit purees.⁴⁶

In Kenya, where the net MVA contribution of processing and preserving of fruits and vegetables has been relatively flat or on the decline, the market potential is significantly based on the growing purchasing power

⁴¹ EAC Trade and Investment Report, 2018

⁴² Kilimo Trust (KT) is a not-for-profit organization working on agriculture for development across the East Africa community – in Kenya, Rwanda, Tanzania, Uganda and Burundi.

⁴³ UNIDO (2011). Agribusiness for Africa's prosperity. Kandeh K. Yumkella, Patrick M. Kormawa, Torben M. Roepstorff and Anthony M. Hawkins (Eds). UNIDO, Austria, 347pp.

⁴⁴ Kilimo Trust 2013. Analysis & Design of a Regional Agricultural Markets Development Programme in the EAC Region: EAC Regional Beans Sub-Sector Report

⁴⁵ Figures available included carbonated drinks, soft drinks and other beverages. The authors adjusted the figures to reflect only the fruit juice component

⁴⁶ Apple, Banana, Mango, Avocado purees. These are not strictly fruit juices but derivatives of fruits

of Kenyan consumers; large firms like Del Monte Ltd and Fresh Squeeze Ltd, continue to compete for more market share with several other small bottlers.⁴⁷

In Uganda, imports of processed fruit juices have been on the decline, but still range between 15 and 18 million litres per annum. Uganda has seven (7) certified fruit juice processors, including Britannia Allied Industries, Century Bottling Company (CBC), and Sameer Agriculture Livestock Ltd (SALL); all are dominant players controlling between 40 and 55% market share. Despite their tight market control, there still is room for tradable juices on the market. Uganda's weekly per capita consumption of fruit juice is highest among health-conscious⁴⁸ consumers, at 3.08 litres with the highest expenditure of USD 6.4. In Uganda, mango is the frequently bought flavour of juice as indicated by over 67% of the consumers.⁴⁹

Policies, regulations, and institutional frameworks

There are several policies, regulations, guidelines, and programs that affect the F&V sector in the EAC region. In general, the value chain operates in an enabling environment that is improving over time, but the environment is not yet effective in facilitating the competitiveness that allows actors to seek and expand opportunities. In particular, there are few effective institutional coordination mechanisms amongst actors.

Examples of specific policies and procedures are provided below:

Laws and regulations of import and export of F&V products

Export and import procedures and regulations on unprocessed agricultural produce and manufactured goods.

Table 3: The main requirements relating to trading in manufactured goods within the EAC region are:

Requirements	Explanation
The EAC Rules of Origin (2015)	The goods must come from/obtained or be produced from one of the EAC Partner States to qualify for zero-tariff/duty under the EAC Rules of Origin.
Product Quality Standards	To protect consumers from sub-standard and harmful products, manufactured products/goods are required to meet quality standards.
Domestic Taxes- that is Value Added Tax (VAT) and Excise Tax	The major domestic taxes charged on manufactured goods/products are Value Added Tax (VAT) and Excise Tax. The main difference between these taxes is that VAT is refundable in some cases while Excise Tax is not refundable. A trader is required to pay these taxes (VAT and Excise Tax) before goods are cleared for sale in the importing country

Source: Authors compilation from secondary sources, 2020

The Import Clearance Certificate/ Certificate of Conformity is obtained from the appointed government agency responsible for ensuring product quality standards in two situations: a) Situation 1: When the Government Standards Agency in the importing country recognizes or accepts the 'mark of quality from the country where the trader comes from; OR b) Situation 2: A sample of the product (s) is laboratory tested and found to meet the required product quality standards.

Exporting and importing procedures for processed fruit juices

The process of importing or exporting processed fruit juices is largely the same across the EAC and includes the following procedures and steps:

Exporting processed fruit juices

When exporting processed fruit juice, various steps and procedures are followed, these range from obtaining the relevant documentation for exporting, to obtaining an export health certificate (given that juice is a food product) to obtain an export certificate. For exports to other EAC markets, or to countries that have a prefer-

⁴⁷ For example: Eyekatch productions Ltd, Avenue Fresh EPZ Ltd, Chiquita Kenya and others

⁴⁸ Other segments, price sensitive versus convenience seekers

⁴⁹ Apple (38%), pineapple (29%), orange (28%), passion (13%), and strawberry (13%)

ential arrangement with the exporter's country (e.g. COMESA, EU, and the USA), a certificate of origin is issued in addition to the export health certificate and export certificate. The Certificate of Origin confirms that the goods in a particular export consignment, have been produced, manufactured, or processed in the particular country where the exporter is based and that they meet the 'originating criteria' set for eligibility purposes.

Importing processed fruit juices

All imports to EAC Partner States are required to have an Import Declaration Forms (IDF); a Certificate of Conformity (CoC) from the PVoC agent for regulated products; an import standard mark (ISM) when applicable; and valid pro forma invoices from the exporting firm. To import any commodity into any of the EAC Partner State countries, an importer is expected to enlist the services of a clearing agent, who will process the import documentation, electronically, through the relevant customs office (such as Kenya Revenue Authority (KRA), Uganda Revenue Authority (URA) Rwanda Revenue Authority (RRA, Tanzania Revenue Authority (TRA) or Burundi Revenue Authority (OBR). An import declaration fee (IDF) of 2.25% of the Cost Insurance & Freight (CIF) value subject is payable. Customs will assess duty payable, depending on the value of the item(s) and the duty rate applicable asset in the EAC tariff book.

Each of the EAC revenue authorities operates an electronic trade portal/single window/system, as a trade facilitation tool, which informs and updates each importer on what the regulatory and documentary requirements are for both the import and export of a given product. A development worth noting is that since the EAC Partner States signed the WTO Trade Facilitation Agreement (WTO TFA), there are ongoing efforts to document all the processes and steps required to import or export a product, and thereafter simplify/shorten them as a measure to facilitate trade and reduce the cost and time involved in the import/export processes. As part of this initiative, the EAC Trade Information Portal (TIP) has been created. The TIP gives access to step-by-step guides on licenses, pre-clearance permits, and clearance formalities, for the most traded goods within, to and from the EAC. The TIP is linked with national trade portals in Kenya, Rwanda, Tanzania, and Uganda.

Market access regulations

Access to the EAC market

Under the Protocol on the Establishment of the East African Customs Union, all the EAC Partner States have committed to eliminating customs duties, other charges of equivalent effect, and non-tariff barriers from being imposed on imports of Processed Fruit Juice originating from any of the EAC Partner States. This means that as long as a Processed Fruit Juice product qualifies for 'originating from EAC' status, it should circulate freely within the EAC territory.

The East African Community Customs Union (Rules of Origin) Rules, 2015 set the origin criteria, against which goods from any EAC Partner States are assessed. Under Rule 4 'Origin criteria', Processed Fruit Juice shall be accepted as originating in an EAC Partner State if they are:

- Wholly produced in the Partner State, which means that the raw material (i.e. fruit) that makes up the processed juice is exclusively or mainly from within the territory of the Partner State;
- Produced in the Partner State, incorporating materials which have not been wholly obtained there, provided that such materials have undergone sufficient working or processing in the Partner State. For Processed Fruit Juice, the Rules of Origin provide that for them to be accepted as originating in any Partner State, the value of all the non-originating materials used does not exceed 70% of the ex-works price of the product.

In addition, under Article 15 of the Customs Union Protocol, processed fruit juice originating from any of the EAC Partner States, should be accorded 'National Treatment' whilst in the territory of another Partner State. This means that no Partner States shall: (a) enact legislation or apply administrative measures which directly or indirectly discriminate against the same or like products of other Partner States; or (b) impose on each other's products any internal taxation of such a nature as to afford indirect protection to other products. Furthermore, the Protocol on the Establishment of the East African Customs Union, protects the EAC market by imposing a 25% Common External Tariff (CET) in respect of all categories of Processed Fruit Juice imported into the EAC Territory.

Regional and international trade policy agreements

The F&V subsector in the EAC region, can benefit from several international trade policies and agreements. The East Partner States, like many African countries and the LDCs and have preferential access into the EU (EU-ACP⁵⁰ trade agreements) and United States of American (AGOA)⁵¹ markets. The EAC Partner States are members of various international trade agreements:

As a member of the World Trade Organization (WTO): EAC Partner States have access to more than 90% of world markets with Most Favoured Nation (MFN) treatment. Individual countries are also members of several regional trade organizations and a signatory to multilateral and bilateral trade agreements, some of which provide trade benefits to the regional industry.

ACP-EU Trade Agreement: This agreement, signed in 2000 between the European Community and the African, Caribbean, and Pacific states (ACP), gives the EAC Partner States access to the EU market.

Common Market of Eastern and Southern Africa (COMESA): Most EAC Partner States are members of COMESA, a regional economic co-operation organization, which has been working to reduce trade barriers applied to goods produced within and traded amongst the 19 member countries. Under COMESA, a Free Trade Area has been in effect since 2000.

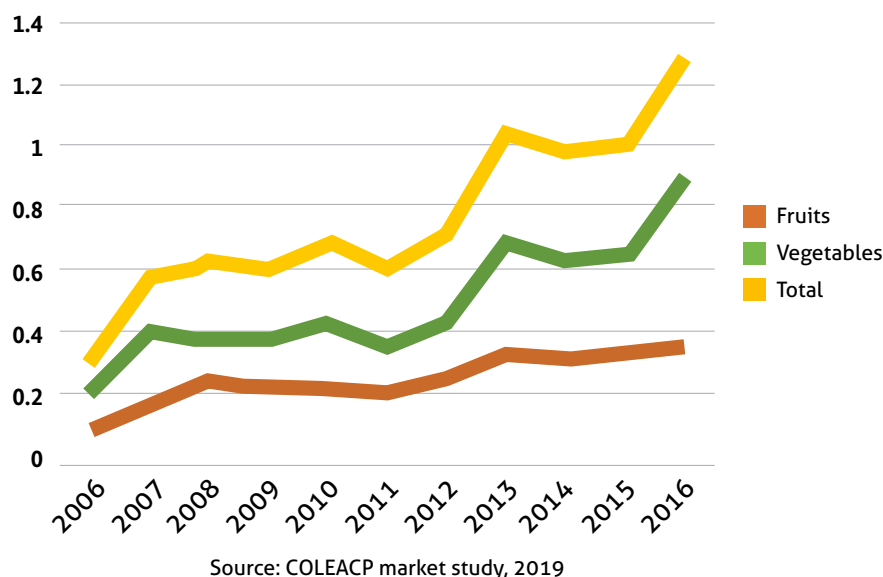
African Growth and Opportunity Act (AGOA): The Act aims to assist the economies of Sub-Saharan Africa through granting trade preferences. Certain goods of EAC Partner States can be exported to the United States duty-free, which is an important support mechanism for cotton, leather and horticulture sub-sectors.

4.3.2 Analysis of EAC trade performance in specific market segments

EAC participation in the global F&V markets

In the global F&Vs market, the volume of EAC trade is estimated at approximately 1.28 million tons per year. The proportion of fresh exports is 86.82%. Processed exports account for the remaining 13.18%. Overall, F&V exports increased by a Compounded Annual Growth Rate of 15% between 2006 and 2016. Vegetable exports have registered more growth at CAGR 16% compared to 15% for fruits.

Figure 7: EAC global F&V exports (million tons)

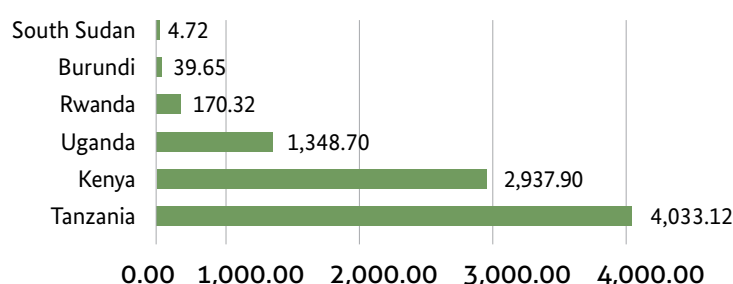


The proportion of exports to the global market from EAC countries are presented below. Overall, Tanzania has the largest export by volume, followed by Kenya, however, when it comes to value, Kenya exports are of higher value compared to Tanzania. This relationship is presented in the following figures.

⁵⁰ African, Caribbean and Pacific Group of States

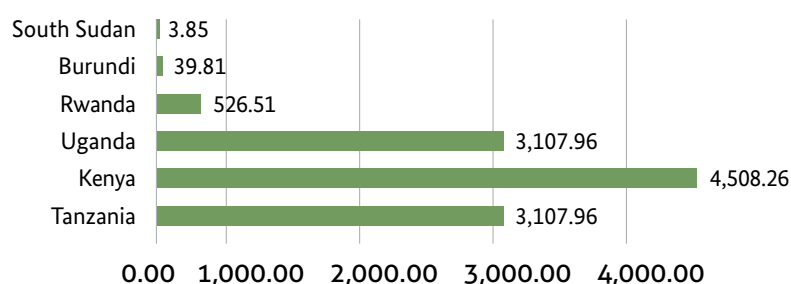
⁵¹ African Growth and Opportunity Act

Figure 8: Volumes of F&Vs exported by EAC countries to the global markets (000'tons)



Source: COLEACP market study, 2019

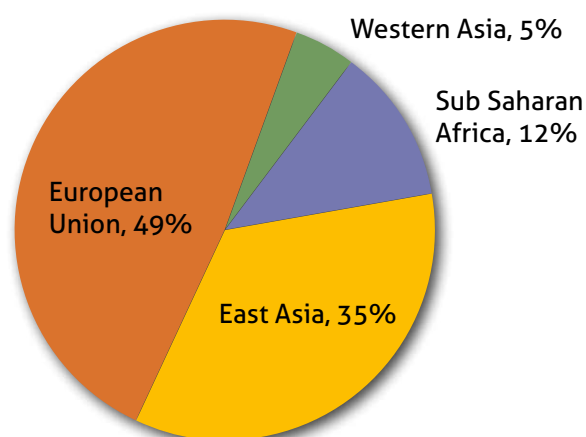
Figure 9: Value of F&Vs exported by EAC countries to global markets (million Euros)



Source: COLEACP market study, 2019

The European Union accounts for the largest share (49%) of F&Vs imported from EAC to the global markets. East Asia also provides a significant market share (34%) for EAC products. The Sub-Saharan market is also a prominent market player (12%).

Figure 10: Proportion of EAC export value by importing country (Euros)



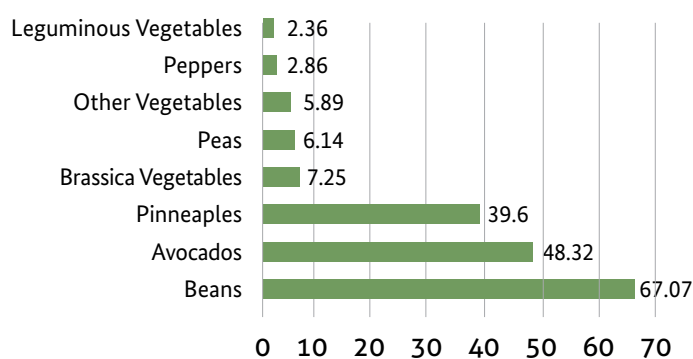
Source: COLEACP market study, 2019

Trade between EAC and European Union

The EAC trade in F&Vs with the European Union, is estimated 187.23 thousand tons per year and valued at approximately 401 million Euro. Vegetables and edible fruits account for 95.00 and 91.32 thousand tons, respectively. The proportion of processed and fresh exports are approximately 37.95% and 62.02% respectively.

The major F&V products exported to the EU are beans, followed by avocados and pineapples. Other important exports are brassica vegetables, peas, pepper, and leguminous vegetables. Their relative shares are presented in the following figure.

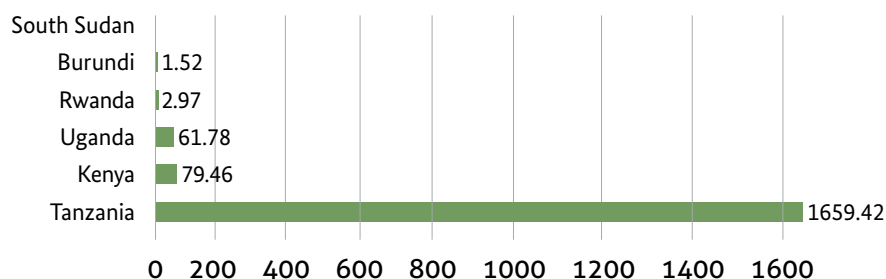
Figure 11: Volumes of EAC exports to the EU by product type (000' tons)



Source: COLEACP market study, 2019

Of all the EAC countries, Kenya is by far the largest exporter of F&Vs to the European Union. Exports from Kenya are estimated at 1,659,420 tons compared to Tanzania (79,460 tons) and Uganda (61,780 tons). Rwanda, Burundi, and South Sudan export relatively lower volumes.

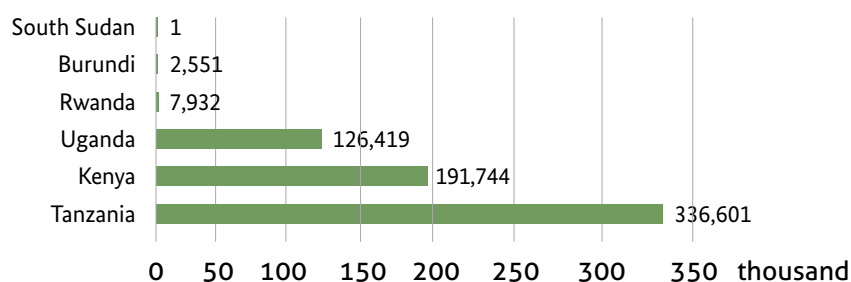
Figure 12: Volumes of F&Vs exported from EAC to the EU by country (000 tons)



Source: COLEACP market study, 2019

The biggest share of the value of F&V exports to the EU accrues to Kenya, owing to the large volume of exports. This is followed by Tanzania and Uganda.

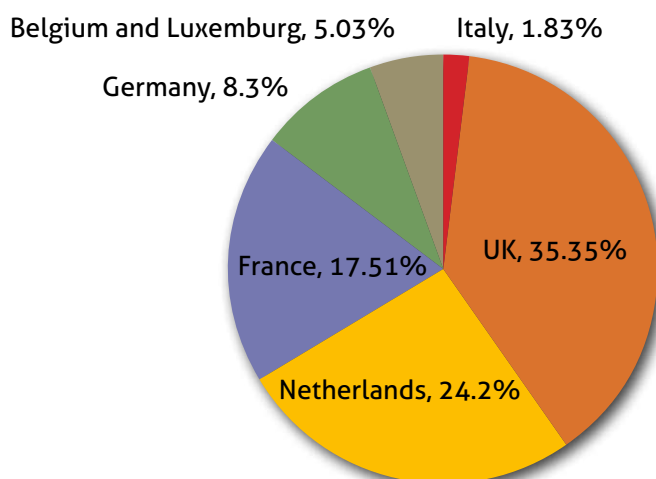
Figure 13: Value of F&Vs exported from EAC to the EU by country (000 Euros)



Source: COLEACP market study, 2019

The major markets for the EAC exports in the EU are the United Kingdom (38%), the Netherlands (26%) and France (19%). Other players including Germany, Belgium, Luxemburg, and Italy, absorb relatively lower volumes although, in aggregate terms, they are also important players.

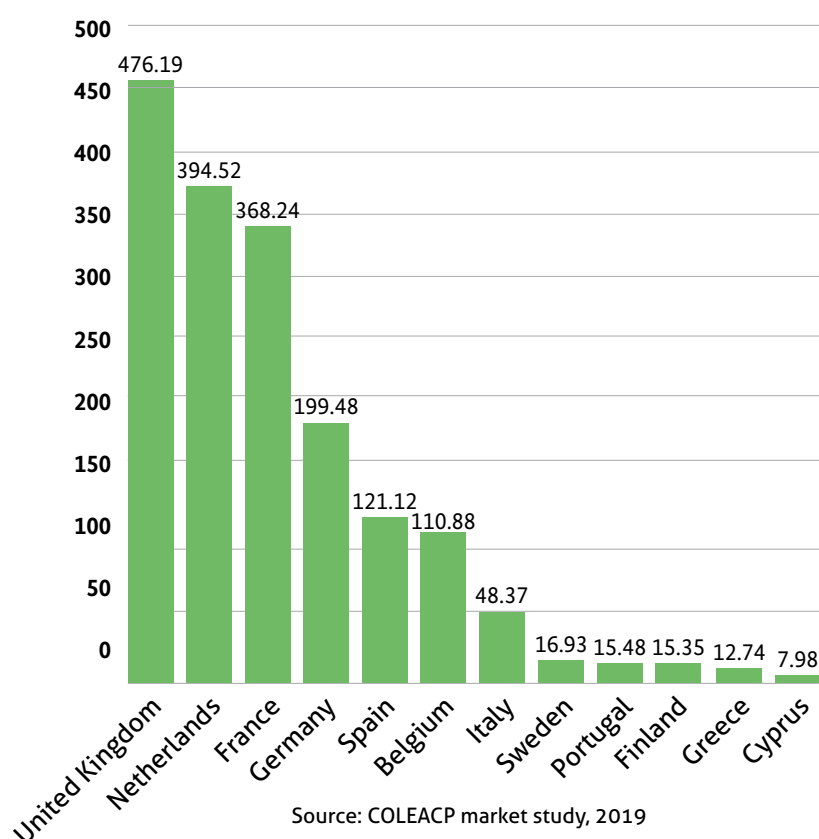
Figure 14: EAC export value of F&Vs by importing country (Euros)



Source: COLEACP market study, 2019

The respective volumes of EAC exports to the EU, by the importing countries, are presented below.

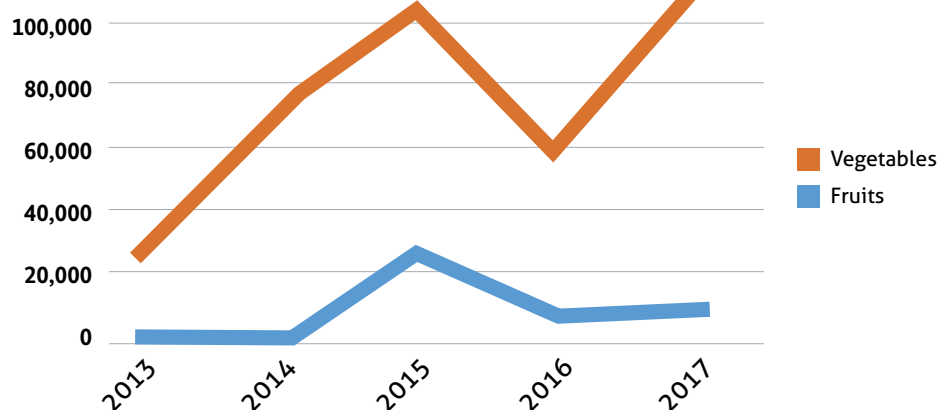
Figure 15: Volumes of EAC's F&V exports to the EU by importing country (000' tons)



The intraregional trade

Market opportunities for fresh fruits and vegetable sub-sectors across the EAC vary by country. The following figures provide an overview of the inter-regional trade of fruits and vegetables. The value of total exports for fruits has been steadily growing over the last five years, more than doubling the amount. The tradable number of vegetables is significantly higher compared with fruits, despite the strong fluctuations in the recent past.

Figure 16: Value of interregional trade (in thousand USD)



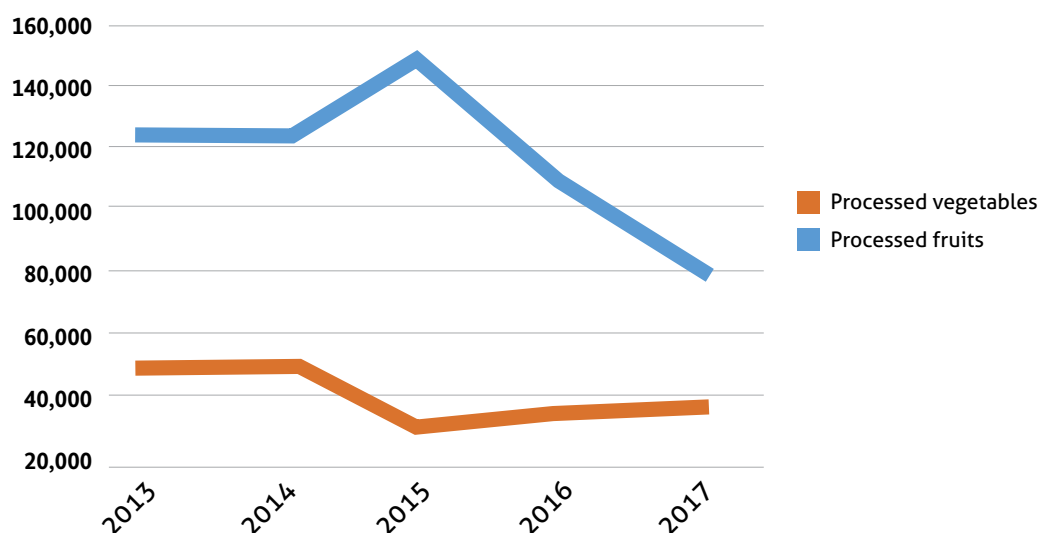
Source: ITC Trade Map (2018), <https://www.trademap.org/Index>

The processed F&V market segment

The total value of exports for processed fruits increased from USD 122 million in 2013, reaching a peak of USD 150 million in 2015, followed by a drastic decline, thereafter, reaching an all-time low of USD 79 million in 2017. In contrast, the value of total exports for processed vegetables (though declined overall) have remained relatively stable.

The above analysis implies that demand for processed fruits is lower than for processed vegetables, but overall, the total value of exported processed fruits and vegetable is significantly lower than of fresh produce. In an actual sense, most customers in the international markets prefer fresh rather than processed products. Producers in the EAC should, therefore, focus more on trading fresh or primary processed (clean, sorted, and packed) fruits and vegetables.

Figure 17: Value of EAC exports of processed F&Vs to the world (in 000' USD)



Source: ITC Trade Map (2018), <https://www.trademap.org/Index>

One critical issue to consider in regard to the above analysis, is the overall level of development of the EAC market. In particular, it should be noted that although various fruit and vegetable suppliers have already operated internationally for a significant number of years, the entire EAC market for fruits and vegetables can be considered as relatively nascent. Currently, the vast majority of fruits and vegetables marketed in the EAC region, are simply moved from farm to market. The current export market for these products is strongly based on selling primary processed produce (i.e. fresh produce, cleaned, graded, and packaged primary product).

As the market matures and local suppliers consolidate their portfolio in terms of production and marketing systems, the number of international stakeholders (buyers) will increase. Trading relationships will also gradually develop (e.g. through long-term contractual trading arrangements), therefore, significantly reducing the fluctuations shown on the previous page.

In response to the positive market signals, the horticulture sector in some EAC Partner States has already established internationally operating supply chains. This will increase the market prospect of fruits and vegetables in the medium to long-term.

Fruit juice

The analysis of the EAC fruits and vegetable market should also consider the fruit juice. This is an important niche (segment) of the value chain, which has had considerable growth in recent years.⁵² For the EAC, juicing is the predominant commercial activity accounting for over 90% of the fruit processing industry in the majority of Partner States.⁵³

Fruit processing in the EAC, is characterized by many small packers and resellers of fruit juices. There are at least two or three lead firms, in each Partner State, with industrial-scale capacity to produce fruit juices. All the lead firms have significant installed aseptic packing capacity (Tanzania –Azam, Kenya – Del Monte, and Kevian -Pick & Peel Brand).⁵⁴

There are significant imports of fruit juice to the EAC market.⁵⁵ In 2017, the EAC imported processed fruit juices worth USD13.9 million, reflecting a substantial decline (-39.6%) between 2013 and 2017. Most of the imports were destined for Kenya (37.7%) and Tanzania (24.8%). With the exception of Kenya (10% growth), all the other Partner States experienced a decline in imports of processed fruit juice(s) between 2013 and 2017; Tanzania (-37.5%), Rwanda (-37%), Uganda (-24.8%), South-Sudan (-81.1%) and Burundi (-32%) respectively.

Table 4: EAC's imports of fruit juice '2009 (processed) USD 000'

Importers	2014	2015	2016	2017	CAGR
EAC aggregation	15,676	12,794	1,306	1,283	-57%
Kenya	6,255	5,377	4,372	5,201	-6%
Tanzania	5,941	4,540	4,230	3,453	-17%
Rwanda	1,100	884	1,635	1,799	18%
Uganda	2,147	1,899	2,515	1,732	-7%
Burundi	233	94	264	398	20%
Year total	31,352	25,588	14,322	13,866	-24%

Source: ITC Trademap (2018), <https://www.trademap.org/Index.aspx>.

The data above shows that imports of fruit juices are gradually declining in the EAC region. All EAC Partner States experienced a fall in imports of processed fruit juice, with the exception of Burundi. EAC exports of fruit juices fell between 2013 and 2017 (-43.6%). During the same period, exports fell highest in Uganda and Rwanda at -87.4% and -96.0 % respectively. In 2015, the EAC region saw a surge in the export of fruit juices at an aggregate of USD71 million, with the bulk of the exports coming from Tanzania (USD40.9 million) in that year. In total, the EAC region exported fruit juices worth USD237.6 million between 2013 and 2017.

⁵² Processing of fruits in the EAC is in four categories namely drying, juicing, freezing and preservation.

⁵³ ATEAS, 2019

⁵⁴ The majority of juices (apple, mango, orange, pineapple) in the EAC are produced by mixing concentrates with sugar, aromas, and preservatives, then cold filled into plastic bottles. These products should not strictly be named "fruit juices" and their preservative content should be in line with the Codex Alimentarius general standard for fruit juices and nectars (i.e. General standard for fruit juices and nectars CODEX STAN 247-2005)

⁵⁵ Regarding imports, only Kenya makes the list for the top five suppliers, with South Africa being the lead and Netherlands, Egypt and India taking a substantial share.

Table 5: EAC's exports of fruit Juice '2009 (processed) 000' USD

Exporter	2014	2015	2016	2017	2018	CAGR
EAC aggregation	43,887	48,986	71,071	48,947	24,715	-13%
Kenya	37,576	39,034	28,358	24,839	28,376	-7%
Tanzania	1,325	6,363	40,922	20,466	1,780	8%
Rwanda	4,141	3,371	1,435	2,527	520	-40%
Uganda	840	208	355	1,115	33	-55%
Burundi	5	10	1	-	4	-5%

Source: ITC Trademap (2018), <https://www.trademap.org/Index.aspx>.

A key conclusion from the above analysis, is that although there has been a general decline in both the exports and imports of fruit juice, there is more decline in imports compared to exports. This could be an indication of increased investment in local production capacity. Going forward, the processed juice sector would appear to be more export-led though on the whole, the level of exports is falling, registering a 43.6% drop between 2013 and 2017.⁵⁶

Caution is made, however, that the data does not include other forms of non-alcoholic drinks that dominate the market. EAC should capitalize on this important gain, through opportunities presented by the “pooled” market. These are also opportunities for consolidating strategic efforts and initiatives to fully integrate the value chain within the EAC region.

4.3.3 Assessment of F&V sector in the individual Partner States

Burundi

Horticultural crops contribute to: improving the nutritional level of the population in Burundi, protecting the environment, creating jobs, diversifying sources of income, and promoting economic development in general. However, horticulture has suffered challenges of insufficient budget allocation although, in 1994, the horticultural sector represented nearly 40% percent of the GDP, or twice that of the cotton sector.

In 2005, production was estimated at 250,000 tons of vegetables and 85,000 tons of fruit. Burundi produced an estimated 7.811 million tons of fruits in 2015, 6.315 million tons in 2016, 6.362 million tons in 2017, 6.356 million tons in 2018, and 4.629 million tons in 2019. Over 55 percent of farmers plant fruit trees for their own consumption; 93 percent target both home consumption and the market, with 2.4 percent of farmers planting fruit trees to target market production only. With regard to the fruit production techniques, 61.5 percent of farmers apply organic manure (OM). The reasons given by those who do not apply these inputs are, among others: (i) lack of resources; (ii) priority for other food crops in a context of scarcity of mulch and (iii) cultivation habits. As for vegetables, Burundi produced 0.205 million tons of vegetables in 2015, 0.205 million tons in 2016, 0.091 million tons in 2017, 0.199 million tons in 2018, and 0.151 million tons in 2019.

The fruits and vegetables processed in Burundi, are mainly Maracutcha, Chili Pepper, Orange, Mandarin, Apple, Papaya, Watermelon, Carrot, Beetroots, Cucumber, Tomatoes, Banana, Pineapple, Tree Tomato, and Strawberries. These are processed into fruit juice, syrup or jam, grenadine, tomato sauce, wine, liqueur, alcoholic drink.

In Burundi, the demand for fresh fruits and vegetables is higher than for processed products, for example, in 2015, Burundi exported 39 million tons of fresh fruit to EAC Partners' markets, whereas in the exported processed fruits were only 1million tons processed.

⁵⁶ The main export markets DRC Congo, USA and Rwanda.

Table 6: Fruit juice products in high demand in Burundi (MT)

HS-Code	2015	2016	2017	2018	2019
2009	1,3	0,4	3,529	14,937	36,59
2008	1	NA	NA	NA	0,042
2002	NA	0,35	NA	NA	NA

Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics

In Burundi, the fruit juice products are in high demand. The potential export markets are Rwanda and RDC Congo.

Table 7: Fresh fruits in high demand in Burundi (MT)

HS-Code	2015	2016	2017	2018	2019
0702	472,48	308,695	NA	NA	NA
0803	596,552	843,229	NA	NA	NA
0804	981,27	1312,347	4498,204	2700,62	4727,48
0803	NA	NA	746,16	1771,685	NA
0805	NA	NA	62,155	35,45	NA
0802	3,78	1,9	7	18,1	43,5
0801	52,7	74,96	12,1	NA	NA
0809	NA	4,2	NA	NA	NA
0806	NA	NA	2	NA	NA
0808	NA	NA	NA	1,44	NA

Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics

In Burundi, the fresh fruits in high demand are 0702 (tomatoes), 0803 (bananas), 0804 (pineapple, avocado, guava), and 0805 (fresh or dried citrus). The potential export markets are Belgium, Rwanda, and Tanzania. The processed vegetables in high demand in Burundi is 2005 (other prepared or preserved vegetables). Most export markets are Rwanda and Tanzania.

Table 8: The demand for fresh vegetable in Burundi

HS-Code	2015	2016	2017	2018	2019
0709	100.231	55.044	0.24	0.4	NA
0703	116.625	62.91	74.44	8	3.65
0704	25.375	8.94	NA	NA	NA
0709	NA	75.899	NA	NA	NA
0708	15	44.3	NA	NA	10.05
0701	0.5	NA	NA	1.2	NA

Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics

The fresh vegetables in high demand in Burundi with the respective HS codes are: 0709 (other vegetables), 0703 (onion, shallots, and leeks) the potential export markets are Belgium, Rwanda, Tanzania, and DR Congo.

Kenya

The horticultural sub-sector is one of Kenya's top foreign exchange earners⁵⁷ and is also the fastest-growing agricultural sub-sector.⁵⁸ The subsector is highly capital intensive, and is practiced close to urban areas, due to the perishable nature of the product.⁵⁹ Horticulture contributes 33% of Kenya's GDP and 38% of export earnings and affects 4.5 million people directly (in production, processing, and marketing) while 3.5 million benefit indirectly.

Kenya produced an estimated 2.83 million tons of fruit in 2012, growing to 3.1 million metric tons in 2013, 3.3 million metric tons in 2014, and reaching 3.4 million metric tons in 2015.⁶⁰

Kenya has a planted acreage of fruits totalling approximately 162,000 Ha, compared to a total land size of approximately 630,000 Ha of horticulture.⁶¹ Kenya's ideal tropical and temperate climatic conditions make it favourable for producing a wide range of fruits and vegetables.⁶²

Kenya exports large quantities of fresh vegetables and fruit to the European market.⁶³ Vegetables and fruit comprise about 20% and 10% respectively of horticulture export earnings. Packing and freezing of fresh vegetables target export markets.

In addition, Kenya has the largest F&V production and processing sector within the EAC region. It has a strong focus on the production of fruit and vegetable juices. Vegetable canning and tomato ketchup production are also important. The Del Monte Company is one of the main players in the sub-sector, producing and processing fruits and juices for both domestic and export markets.⁶⁴

Kenya has witnessed a growing local demand for juice and vegetable products in recent years. The rise in demand reflects a growing middle class,⁶⁵ increased urbanization⁶⁶, and rising per capita income.⁶⁷ In 2017, Kenya imported juice of vegetables (HS '200989) worth USD1.4 million, mixtures of fruit juices (HS '200990) worth USD1.2 million, and orange juice (HS '200989) worth USD1.1 million. The demand for the juice of fruit or vegetables (HS 200989) grew by 202.2% (2013-2017). There is particular growth in demand for orange juice ('200919) at 422.2% between 2013 and 2017.⁶⁸ Products with the most significant change in the Compound Annual Growth Rate, are grapefruit juice (CAGR=121%), orange juice (CAGR=53%), and vegetable juices (CAGR=32%).

Table 9: Fruit juice products in high demand in Kenya (000' USD)

HS Code	2013	2014	2015	2016	2017	CAGR
200989 ⁶⁹	493	774	653	1,102	1,496	32%
'200990 ⁷⁰	2,357	2,256	1,832	1,171	1,216	-15%
'200919 ⁷¹	213	172	382	875	1,153	53%
'200979 ⁷²	18	123	408	273	430	121%
'200969 ⁷³	599	1,141	872	531	373	-11%

Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics.

⁵⁷ <https://informationcradle.com/kenya/horticulture-in-kenya/>

⁵⁸ <https://www.businessdailyafrica.com/datahub/Kenya-s-horticulture-exports/3815418-4121118-04ygd4/index.html>

⁵⁹ The floriculture sub-sector accounts for a significant proportion of horticulture exports.

⁶⁰ HCD Kenya (2017) Bananas account for ~ 46% while Pineapples account for ~ 15% of fruit production

⁶¹ ATEAS, 2019

⁶² Muthoka, M.N. and Ogotu, M. (2014).

⁶³ Kenya National Bureau of Statistics (KNBS),

⁶⁴ ibid

⁶⁵ The growing middle class has largely influenced changes in the consumption patterns of the general population.

⁶⁶ The share of urban population in total population increased from 25.22% in 2014 to 26.56% in 2017

⁶⁷ In 2018, the estimated GDP per capita in Kenya amounted to around 1,830.59 U.S. dollars. This is expected to increase to 2,294.24 US dollars in 2021

⁶⁸ ibid

⁶⁹ Juice of fruit or vegetables, unfermented, whether containing added sugar or other sweetening

⁷⁰ Mixtures of fruit juices, incl. grape must, and vegetable juices, unfermented, whether or not

⁷¹ Orange juice, unfermented, whether or not containing added sugar or other sweetening matter

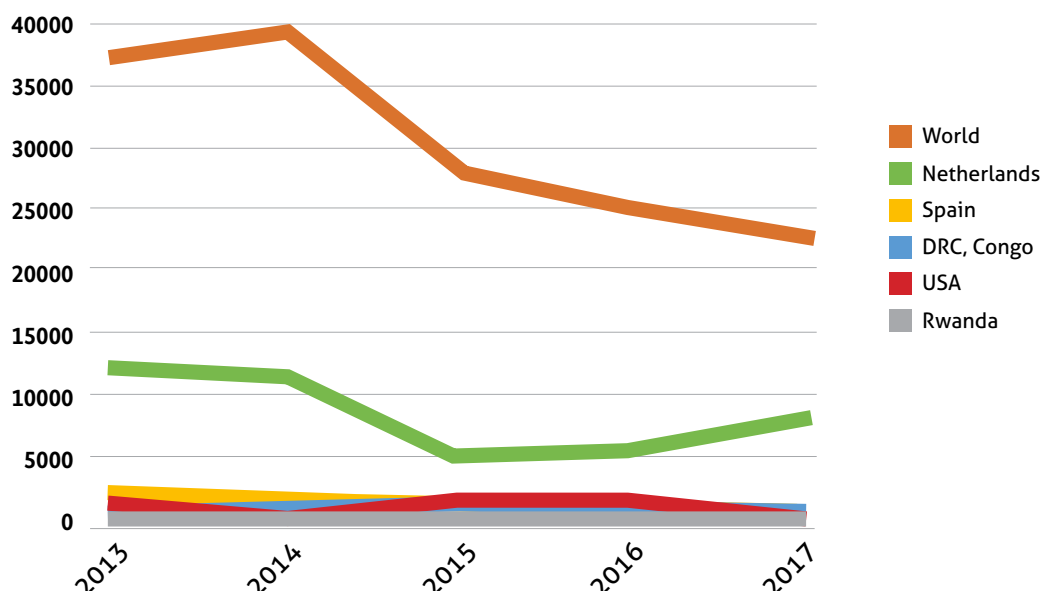
⁷² Grapefruit juice, unfermented, Brix value > 20 at 20°C, whether or not containing added sugar

⁷³ Apple juice, unfermented, Brix value > 20 at 20°C, whether or not containing added sugar

Kenya exports significant volumes of fruit and vegetable juice

Cumulatively, Kenya has earned USD152.1 million from its fruit juice exports between 2013 and 2017, most of it was destined for the Netherlands (28.1%). This is despite the sharp decline (-40%) in exports observed in the same period.

Figure 18: Kenya Exports and Markets of Fruit Juices - HS 2009 (USD 000')



Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics

Tanzania

In Tanzania, horticulture is the fastest growing sub-sector within the agricultural sector, with an annual growth rate of 9-12%.⁷⁴ This growth is more than double the overall growth rate of the agriculture sector. In 2015, horticulture contributed 38% of the foreign income earned from the agriculture sector. The export value in 2015 reached USD 545 million, compared to USD 64 million in 2005.

Tanzania is among the top 20 producers of fresh vegetables, according to FAOSTAT data, although it has an insignificant position in the export of vegetables, mainly due to the current business arrangements in which Tanzania exporting companies are subsidiaries of larger aggregations of companies, often based in Kenya, and those kinds of exports are not fully captured in the Tanzanian data.⁷⁵

The sector is dominated by small firms, with very few large companies. Overall, the aggregate production of fresh F&V in Tanzania has displayed an increasing trend over the past several years. With a Cumulative Annual Growth Rate (CAGR) of 7%, the aggregate production of vegetables has grown faster than fresh fruits (CAGR=4%). This underscores the growing dominance of the F&V subsector in the national economy.⁷⁶

There is also significant demand for processed products, particularly fruit juice products, which indicated the opportunity for production and trade within the value chain. In 2017 for example, Tanzania imported fresh juice mixtures (HS '200990) worth USD1.3 million. This was followed by the juice of fruit or vegetables (HS '20099) at USD877,000 in 2017.

⁷⁴ Kingdom of Netherlands (2017): Horticulture Study: Mapping of Production of Fruits and vegetables in Tanzania Available at <https://www.rvo.nl/sites/default/files/2017/05/Studie%20Tanzaniaanse%20Tuinbouwsector%202017.pdf>

⁷⁵ ibid

⁷⁶ ATEAS, Sector Guide for Processed Fruit Juice in The East African Community, 2019

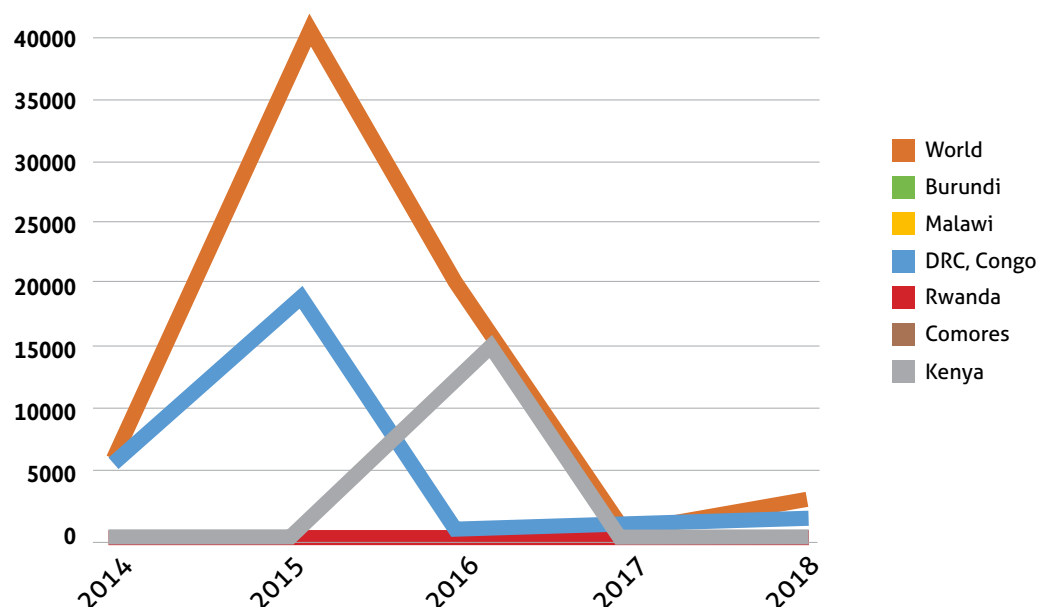
Table 10: Fruit juice products in high demand by Tanzania, (000' USD)

HS Code	2013	2014	2015	2016	2017
'200990 ⁷⁷	2,998	1,670	1,607	1,389	1,399
'200989 ⁷⁸	364	793	1,111	1,089	875
'200979 ⁷⁹	1,058	515	795	818	575
'200919 ⁸⁰	479	2,382	506	268	200
'200969 ⁸¹	89	338	168	133	135

Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics.

Tanzania produces 2.75 million tons of fruit, of which, only 4% is processed.⁸² Although the processing industry is still at an infant stage, Tanzania has started exporting fruit juices to neighbouring countries. Total exports between 2014 and 2018, are estimated at USD72 million. Most of it was destined for Congo-DRC and Comoros at 34.6% and 43.3% respectively. Tanzania's exports of fruit juices dropped by -55.6% between 2014 and 2018. The country experienced a surge in the exports of fruit juices in 2015 and 2016.

Figure 19: Tanzania's exports of fruit juices (in 000' US\$)



Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics

Uganda

Available data suggests that Uganda remains the largest producer of fresh fruits and vegetables in the EAC, producing an estimated 5.5 to 6.0 million metric tons per annum, up from approximately 1.1 million per annum in 2005.⁸³ Uganda has unexploited potential to produce fruits and vegetables, such as mangoes, citrus, pineapples and tomatoes, among others. Most of the fruits and vegetables are grown by households on a small-scale and there is limited commercial fruit and vegetable production. The harvesting periods coincide with the northern hemisphere winter, a period of peak demand for fresh fruit and vegetables in Europe. The fertile soils and conducive climate, guarantee fruit and vegetable production for the greater part of the year.

⁷⁷ Mixtures of fruit juices, incl. grape must, and vegetable juices, unfermented, whether or not ...

⁷⁸ Juice of fruit or vegetables, unfermented, whether or not containing added sugar or other sweetening

⁷⁹ Apple juice, unfermented, Brix value > 20 at 20°C, whether or not containing added sugar

⁸⁰ Orange juice, unfermented, whether or not containing added sugar or other sweetening matter ...

⁸¹ Grape juice, incl. grape must, unfermented, Brix value > 30 at 20°C, whether or not containing ...

⁸² ibid

⁸³ ATEAS, 2019

Fruit and vegetable production in Uganda is in the hands of smallholder farmers. Demand for fruit and vegetables domestically, is moderate but increasing and the growing demand for organic fruits and vegetables in Europe is a potential incentive for Uganda's farmers and processors.

In Uganda, the most demanded juice is orange juice (HS 200919). Total imports in 2017 are estimated at USD 922,000, however, its imports dropped between 2013 and 2017 (-55.3%). Juices of fruit or vegetables (HS '200989) were the next most sought after in 2017 (USD 322,000), and imports grew by 794.4% between 2013 and 2017.

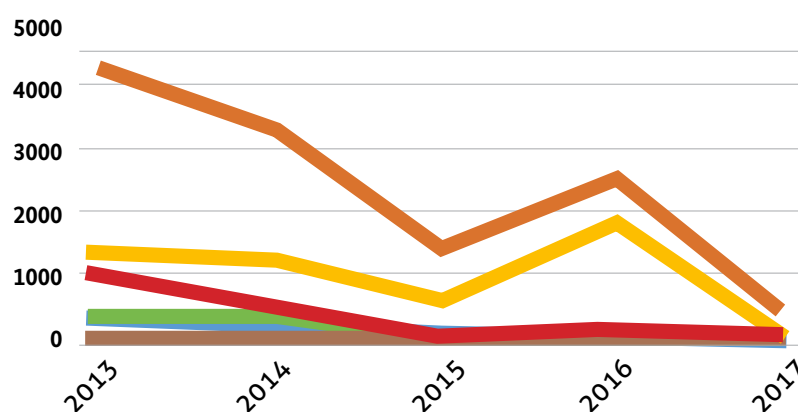
Table 11: Fruit juice products in high demand by Uganda (000' USD)

HS Code	2013	2014	2015	2016	2017	CAGR
200919 ⁸⁴	2,066	1,897	1,600	1,194	922	-18%
'200989 ⁸⁵	36	43	53	262	322	73%
'200990 ⁸⁶	128	60	100	771	172	8%
200979 ⁸⁷	56	140	84	132	116	20%
'200911 ⁸⁸	6	NA	48	70	115	109%
'200969 ⁸⁹	0	1	8	10	43	250%

Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics.

There are over 15 companies exporting fresh fruits and vegetables, largely to the EU and to the COMESA region, although still on a small scale.⁹⁰ Uganda's exports of fruit juices to the world totalled USD11.9 million between 2013 and 2017. Most of its exports were destined for South Sudan (42%) and Rwanda (18.3%) as a total between 2013 and 2017. The growth shows that Uganda's exports of fruit juices have declined significantly between 2013 and 2017.

Figure 20: Uganda's Exports of Fruit Juices HS 2009, by Export Market, (USD 000')



Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics

Uganda has a relatively low market share for almost all horticultural products, and, because buyers generally like to spread their supply base over several countries, Uganda has an opportunity for rapid growth. Based on products that are already being exported in relatively small quantities, the value of horticultural exports could grow to USD 75-100 million FOB by the end of the decade. In the long term, according to IDEA estimates, existing exports could be increased by at least ten times to USD 300 million with sufficient investment.⁹¹

⁸⁴ Orange juice, unfermented, whether or not containing added sugar or other sweetening matter

⁸⁵ Juice of fruit or vegetables, unfermented, whether or not containing added sugar or other sweetening.

⁸⁶ Mixtures of fruit juices, incl. grape must, and vegetable juices, unfermented, whether or not ...

⁸⁷ Apple juice, unfermented, Brix value > 20 at 20°C, whether or not containing added sugar or ...

⁸⁸ Frozen orange juice, unfermented, whether or not containing added sugar or other sweetening ...

⁸⁹ Grape juice, incl. grape must, unfermented, Brix value >30 at 20°C, whether or not containing ...

⁹⁰ ibid

⁹¹ Sonko, R., et al (2005)

Rwanda

The agro-processing industry in Rwanda is relatively weak, despite the importance of agriculture to the economy.⁹² Consequently, the Government of Rwanda is placing a strong emphasis on developing the horticultural sector to capture additional value. The Government considers that Rwanda has a competitive advantage in this sector and that the sub-sector can develop through value addition and diversification, such as focusing on organic and value-added products including juices and dried fruits/chilies.

Rwanda's National Horticultural Policy and Implementation Plan (2014)⁹³, seeks to increase the contribution of horticulture to the national economy. In 2013, the sector contributed 3.2% of GDP. Despite the target to increase horticulture exports ten-fold by 2018 (from USD 11 million in 2013), the figures declined to USD 5.8 million by the end of the 2016 financial year, due to poor infrastructure, limited public/private partnerships, and poor market information and strategies.⁹⁴

Almost 95% of horticultural output is by small-scale producers, making it difficult to produce large volumes with the necessary quality standards, or to meet the sanitary and phytosanitary requirements of the international market. Key constraints also include lack of adequate land to achieve economies of scale; lack of knowledge on crop cultivation, fertilizer and pest management, export procedures and requirements; and the low ratio of agronomists to farmers.

The main vegetables grown are cabbage, tomato, and eggplant. The main fruit is fruit banana, followed by avocado, pineapple, and mango. Juice production (pineapple and passion fruit) currently makes up the largest segment of fruit and vegetable processing. A small number of enterprises produce strawberry, pineapple, and gooseberry jams and preserves. A few enterprises produce dry fruits and vegetables, while others process tomato paste, ketchup, and another produce avocado oil.

There is a local demand for juice products in the Rwandan market, particularly the mixtures of fruit juices (Hs '200990). About USD 1.1 million worth was imported in 2017, however, there has been a sharp decline (-54.8%) in the demand for mixtures of fruit juices into Rwanda. There is notable growth in demand for Juice of fruit or vegetable ('200989) between 2013 and 2017 (594.3%).

Table 12: Fruit juice products in high demand by Rwanda (000' USD)

HS Code	2013	2014	2015	2016	2017	CAGR
'200990 ⁹⁵	2,456	550	647	867	1,109	-18%
'200989 ⁹⁶	53	136	134	357	368	62%
'200979 ⁹⁷	83	287	22	243	199	24%
'200961 ⁹⁸	0	2	0	0	27	NA
'200919 ⁹⁹	84	20	16	22	25	-26%

Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics.

Rwanda earned a total of USD 3.1 million from its exports of fruit juices between 2012 and 2016. Most of it (76.3%) was destined for the DRC (Congo). Rwanda's exports of fruit juices rose between 2013 and 2016.

⁹² <http://eacsof.net/upload/Rwanda/Agro-processing%20Trade%20NOTE%20-%20Rwanda-1.pdf>

⁹³ http://www.naeb.gov.rw/fileadmin/documents/National_Horticulture_Policy_and_Strategic_Plan.pdf

⁹⁴ <https://www.newtimes.co.rw/section/read/202041>

⁹⁵ Mixtures of fruit juices, incl. grape must, and vegetable juices, unfermented, whether or not ...

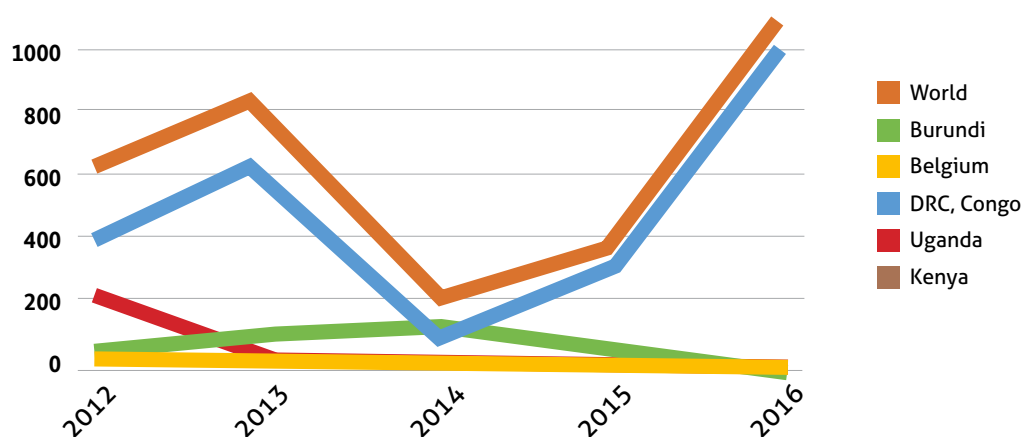
⁹⁶ Juice of fruit or vegetables, unfermented, whether or not containing added sugar or other sweetening ...

⁹⁷ Apple juice, unfermented, Brix value > 20 at 20°C, whether or not containing added sugar or ...

⁹⁸ Grape juice, incl. grape must, unfermented, Brix value <= 30at 20°C, whether or not containing ...

⁹⁹ Orange juice, unfermented, whether or not containing added sugar or other sweetening matter

Figure 21: Rwanda's exports of fruit juices HS 2009, by export market (USD 000')



Source: ATEAS database based on ITC calculations from UN COMTRADE and ITC statistics

South Sudan

Fruit and vegetable processing is currently non-existent, although large quantities of these products are grown and supplied to local urban and rural markets.

Summary

The scenario analysis presented above, has highlighted several important issues which need to be considered in the preparation of the Regional Strategy and Action Plan. From a global standpoint, demand for fresh vegetables has increased significantly over the past 15 years. There has also been an overall increase in the global consumption of edible fruits. Demand for processed F&Vs has also increased and the market is expected to witness stable growth during the next five years. Key processed products include fruit juices, vegetable concentrates, and organic pulps and purees.

A wide range of fresh and processed F&Vs are imported into the European market. Europe enjoys the leading position in the global fruit juice market, however, the Middle East and Africa is the fastest-growing region of the global market for fruit and vegetable juices. The current average per capita consumption of fruit and vegetable juices in the Middle East and Africa region, is comparatively lower than that of the developed regions, but is increasing at a quick pace.

Demand for fresh F&Vs from Sub Saharan Africa (SSA,) has also followed the same trend as the global market. Overall, trade volume has increased by double digits in the major markets. Most of the trade expansion has happened within the SSA region itself. The East Asian market has also grown substantially, this is considered as an emerging market. Trade with the European Union has also expanded, although not at the same levels as other markets. However, this traditional market remains attractive for products from Sub-Saharan Africa. The vegetable products from SSA in most demand in the European Union, are cauliflower, dried peas, sweetcorn, sweet potatoes, onion, and ethnic vegetables. The main fruits are watermelons, grapes, avocado, and mangoes.

The F&V sector plays a significant role in the EAC economies. The sector represents a significant proportion of GDP, and contributes a large share of employment opportunities due to its labour intensive nature of the sector. The market prospects are very high (short and long-term), global demand is steadily growing and the sector has already established a relatively well functioning, internationally operating supply chains in some Partner States, furthermore, the potential for value addition is very high. The sector can have a very positive impact on poverty reduction and food security. Due to a very high proportion of informal trade, the potential for improving formal trade is also high, both nationally and regionally. Vertical regional integration can significantly improve the competitive advantage of the EAC region on international markets. The F&V sector is very diverse with many individual value chains, which have a very high potential for quick wins. Finally, various national policies, strategies, and sectors specific regulations are already in place in the EAC Partner States and require regional harmonization.

The analysis has also pointed to the rapidly changing consumption patterns in which there has been a big shift from massive consumption of traditional foods to more consumption of fruits, vegetables, and other high-value products, including processed foods. These changes are being triggered by altered consumer preferences and growing health awareness, both at the global level and in developing countries.



Chapter 5

Assessment of Quality Infrastructure

Generally, EAC is equipped in terms of harmonized standards and availability of a regional SPS Protocol and some measures to effectively develop a strategy for processed fruit and vegetable sub-sector. The architecture of a quality infrastructure element, within the F&V supply chain, is geared to ensure free circulation of produce. Fundamental requirements which need to be met include protection of public health; consumer information and protection, the integrity of business transactions; environmental protection; and a need to ensure public inspections.

The EAC Standardization, Quality Assurance, Metrology and Testing (SQMT) Act (2006), was developed in line with the EAC Protocol on SQMT, which provided for regional cooperation in the areas of standards, metrology, conformity assessment, accreditation and technical regulations. The objective of the SQMT Act, was to facilitate industrial development and trade and to ensure the protection of the health and safety of society and the environment within the community. The SQMT Act also provided for the development of East African Standards (EAS).

Figure 22: Organization of quality infrastructure support to the F&V sector



5.1 Institutions for maintaining quality infrastructure

The institutions responsible for standards and conformity assessment services in the EAC Partner States are called the National Standards Bodies (NSBs). The EAC SQMT Act provides for each Partner State to designate a national quality system institution. Each EAC Partner State has an NSB responsible for the implementation of standards at the national level. The institution functions as a National Standards Body (NSB), a National Metrology Institute, a National Legal Metrology Department, and a National Accreditation Body (NAB).

The NSBs are mandated to develop and publish standards, in line with internationally recognized procedures, and give effect to the decisions and recommendations of the Council and the EASC about East African Standards. The NSBs represent the country on the EASC and in all relevant regional and international standardization organizations, such as the International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), etc.

In addition to the National Standards Bodies, there are also institutions responsible for sanitary and Phytosanitary certification and plant health institutions.

5.2 Challenges associated with Quality Infrastructure in the EAC

The quality infrastructure in the EAC region has several challenges, which can be grouped as following: specific to quality infrastructure institutions; standards and technical requirements; certification and guarantee systems; food quality; food testing infrastructure; and surveillance systems and procedures at points of entry.

5.2.1 Plant Health Institutions

The current institutional setup within the EAC Partner States, has not provided for the International Plant Protection Convention (IPPC) central Contact Point within the Secretariat, although EAC Partner States are compliant to this requirement, largely by being contracting parties to the IPPC. Due to limited capacities, phytosanitary certificates are issued upon inspection at the point of exit, without necessarily inspecting the production points of plants and plant products. In an actual sense, the National Plant Protection Organizations (NPPOs) of the Partner States should be responsible for issuing phytosanitary certificates. A number of NPPOs have limited capacities and challenges, in terms of limited trained personnel for surveillance purposes, and due to scarce field transport, specialized surveillance equipment, and tools as well as a lack of a phytosanitary protocol for various plants, surveillance services remain poor. The inspectors are also not well facilitated in terms of means of transport to and from the field and other testing capacities.

5.2.2 Sanitary and Phyto Sanitary (SPS) institutions

Food is heavily regulated through compulsory food safety standards and SPS Measures. The EAC does not currently have a Regional SPS committee, which awaits the enactment of the SPS Bill which has been initiated. There is currently no designated institution at the EAC regional level mandated for food safety controls, although at the national level, each Partner State has its food control system. For this reason, the EAC has not been able to intervene in food safety trade disputes between the EAC Partner States.¹⁰⁰ Food safety chemical and microbiological laboratories are currently limited in number and performance in most EAC member countries.

5.2.3 Standards and Technical Requirements

Standards and Technical Regulations are available within the EAC and a number of them are harmonized. However, the major challenge is that there is limited participation of the private sector in Standards Committees. Below is a description of prevailing standards and technical requirements and their implications to the F&V subsector in the EAC. Major safety parameters include: Minimum Residue Levels (MRLs) and heavy metal contaminants limits, which need to consider recent risk assessments for a particular contaminant. At the international level, the codex committee on contaminants in food, regularly reviews the permissible level of heavy metal contaminants in food products. In the context of EAC, the standards for vegetables need to be aligned to the latest risk-based limits established by the Codex Alimentarius Commission. This has not happened in the majority of countries. There are also external audit requirements to be fulfilled. These include assessments based on HACCP, export licensing approval, Social Compliance SA 8000, Quality Systems Audit ISO 9001, Health and Safety Audit, EMS, etc.

¹⁰⁰ Tanzania is the only EAC member country which currently has a single agency responsible for food safety controls. Tanzania Food and Drugs Authority (TFDA) under the Ministry of Health and Social Welfare (MHSW).

Private-sector standards are playing an increasingly important role in the marketplace as far as technical regulations are concerned. Many supermarket chains have formulated their standards, either as individual chains or on an industry-wide basis (e.g. the European supermarket sector). The major problem with private sector standards is that they are stricter than the regulations and require expensive certification, however, the product has to comply with the regulations anyway, so it doesn't matter if this is required by the private standard or not. Most Private voluntary standards (PVS) involve multidimensional food safety, occupational health and safety, environmental and, sometimes, social requirements.¹⁰¹

5.2.4 Certification and Guarantee systems¹⁰²

A large number of management and food safety standards have been adopted in the fresh F&V industry globally. HACCP, ISO 9000, and BRC Global Standard are the most widely applied for F&Vs packing and processing.¹⁰³ As food safety is a top priority in all European food sectors, it is logical to expect most buyers to request extra guarantees in the form of certification. All actors in the supply chain, such as traders, food processors, and retailers, require the implementation of a food safety management system based on hazard analysis and critical control points (HACCP).

The certification initiatives and processes across the EAC face several challenges, including unstructured producer and marketing systems – the majority being SMEs and not unified; Inadequate skills for development and implementation of effective quality assurance systems; costs of certification; availability of certification bodies; lack funds for certification process; compliance cost due to foreign certification bodies; and limited skills and professionals in certification.

5.2.5 The challenge of quality of locally consumed F&Vs

In general, the quality of locally consumed F&Vs in the EAC region products is unregulated and products could be excessively sprayed with pesticides and little attention has been paid to food testing. The root cause of this problem is that currently, more emphasis has been on the safety of crops destined for exports and less effort on the locally consumed products. Approximately 90% of horticulture products are consumed locally, with the remaining 10% being exported. This implies that the majority of East Africans are likely to consume contaminated F&V products.

The above challenges have tended to "block" the consumption of locally produced F&V products particularly by the high-end segment market outlets (e.g. tourism, and mining). This segment presents large opportunities for consumption, however, this potential has remained largely untapped. In many cases, big companies in these sectors have been importing fruits and vegetables from outside the region, due to quality-related challenges. To address this challenge, better certification schemes need to be established.

¹⁰¹ From a supplier's perspective, compliance to standards is a voluntary activity. On the other hand, technical regulations which are quite similar to standards, have to be complied with by law – noncompliance is illegal.

¹⁰² Product Certification in the EAC Certification is the procedure by which a third party gives written assurance that a product, process or service conforms to specified requirements. Product certification involves the issuance of a certificate and/or mark to demonstrate that a specific product meets a defined set of required standards. It should be noted that certification against private standards is not usually done at National Standards Body (NSB). If NSB certify, they usually do so against their national standards and not the EAS.

¹⁰³ There are several enterprises providing training in Food Safety Management systems as well as Good Agricultural Practices.

Chapter 6

SWOT Analysis

In concluding the Situational Analysis of the F&V sector in the EAC region, an attempt has been made to develop a SWOT analysis to provide a quick snapshot of the subsector in terms of its Strengths, Weaknesses, Opportunities, and Threats. This has been developed through the examination of how the subsector operates and the associated dynamics, in the context of the EAC region. The key assumption behind the analysis is that both the internal factors (Strengths and Weaknesses) as well as external factors (Opportunities and Threats) in their totality, will have a bearing on the scope for achieving the intended objective of fostering the competitiveness of the East African F&V subsector. The analysis is presented on the next page.



Table 13: SWOT analysis for F&V sector in the EAC

Strengths • Abundant availability of arable; • Labour availability; • Short production cycles (for vegetables); • Suitable climatic conditions for continuous production; • Priority sector status for most governments; • Network of manufacturing facilities available; • Vast domestic market; traditional fruits and vegetables easily saleable locally; • Good export performance pre-established for selected products; • Minimal entry barriers and business start-up procedures; • Many support organizations active in the sector.	Weaknesses • Small and weak production base, fragmented sector, the mismatch between supply and demand for processed products • High pre- and post-harvest losses – across the entire VC spectrum - harvesting, storage, packaging, transportation, and marketing • Limited availability of local expertise for commercial production of F&Vs - insufficient local skills and knowledge base • Irregular supply of necessary inputs, lack of access to capital for investment; • Low availability of adequate infrastructural facilities (storerooms, cooling houses, etc.) – leading to product deterioration • Underdeveloped infrastructure to support mass production, processing, transportation, and marketing of F&Vs • Limited processing technologies for value addition • Poor market linkages, small market share, weak info systems, low level of service provision in the sector, a large number of intermediaries along the chain • Lack of adequate quality control and testing methods as per international standards • Poor subsector coordination – e.g. inadequately developed linkages between R&D organizations and industry, • Lack of access to innovative financial services for investment in technologies.
Opportunities • Many fruits and vegetables can be grown in the EAC region, offering vast potential for agro-processing activities • Scope for establishing Agri-Export Zones (AEZ) and food parks to incentivize greenfield projects; • Rising income levels and changing consumption patterns increase local demand; • Established industrial base for the production of supporting equipment, e.g., packaging industry; • Opening of global markets; • New market destinations are emerging; • High potential for job creation; • Steady improvements in agricultural financing.	Threats • International competition; • Termination of preferential treatment; • Absence of collaborative effort within the value chain; • Strong seasonal and annual price fluctuations for fruits and vegetables; • Labour migration to urban areas seeking better employment opportunities. • Climate change variability • Human pandemics (COVID-19)



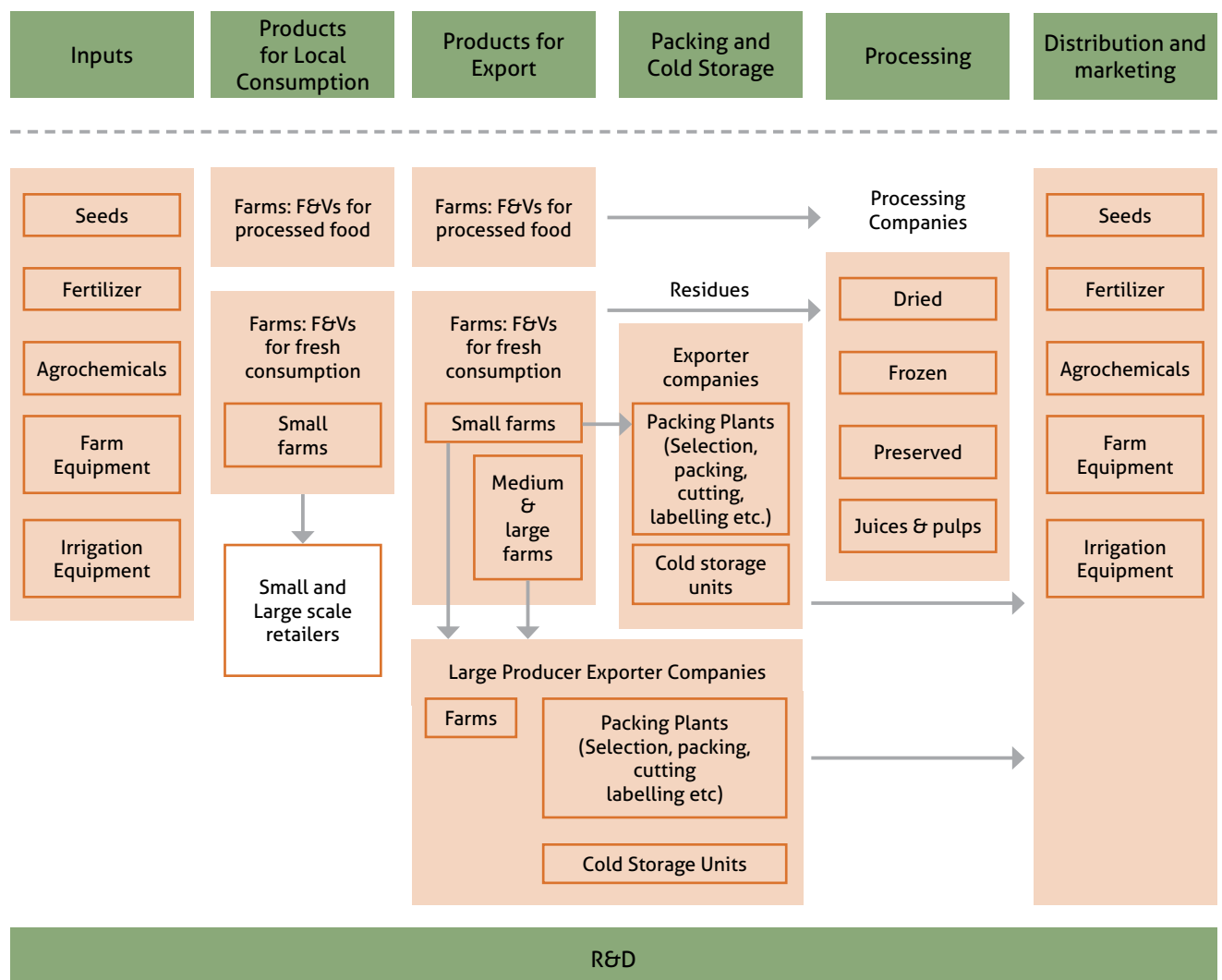
Chapter 7

Challenges

The F&V Value Chain can be grouped into six (6) general interlinked stages and/or segments, as shown in Figure 23 below. The intermediary stages range from input suppliers at the production stage, to distribution and marketing at the consumption stage, however, the complexity of the value chain differs between domestic trade and processed fruits and vegetable trade.

Despite the big growing market size and demand projections, the F&V industry faces several challenges. This analysis will focus on key challenges and limitations related to each segment of the value chain. The analysis, together with key findings and conclusions will be used to draw key interventions to be supported under the proposed F&V Strategy and Action Plan 2021-2031.

Figure 23: Value chain map for the EAC fruits and vegetables



The remainder of this section presents details of key challenges in each segment of the value chain. Other relevant challenges are also presented according to their main thematic areas.

7.1 Weak production base

The fruits and vegetables production base across the EAC is fragmented, smallholder dominated, and with low yield per acre as well as low productivity. The timely availability of farm inputs is also poor. In general, key challenges of on-farm inputs are related to their accessibility, availability, and affordability. This makes the position of smallholder F&V farmers in the EAC relatively precarious, particularly among small-holder farmers who constitute a large production share (60%-80%) of the sub-sector.

Overall, the input manufacturing activities in the F&V sector are relatively underdeveloped with limited involvement of the private sector in the multiplication of breeders and foundation seed; weak quality control mechanism for inputs; weak input procurement and distribution system; and low utilization of modern inputs in the production systems. In general, the relatively small size of the sector is not attractive to input manufacturers. This is more so for smallholder systems. The availability of good quality planting material particularly for fruits is also limited. Upstream poor fruit husbandry yields fruits with low conversion ratio, low Brix levels as well as varieties that aren't suited for industrial juice production.¹⁰⁴

In addition to the above, the F&V sector suffers from high wastage and low processing levels. For example, Kenya and Tanzania estimate that up to 40% of harvested fruits are wasted, while only about 8% is processed.¹⁰⁵ In general, post-harvest losses in the sector are occasioned by: poor transportation systems – e.g. rural roads; poor means of harvest; poor market infrastructure - transport, packaging materials, storage, etc.); hygienic conditions of the local markets and poor sorting and grading. Depending on the situation and the crop in question, the post-harvest loss may reach 40-50%.¹⁰⁶ In addition, there are specific challenges in each segment of the value chain as presented below.

Table 14: Specific value chain segment post-harvest loss challenges

Value chain segment	Specific challenges
Input suppliers	Lack of local availability of many of the most needed goods/supplies; and difficulties and high costs for importing needed postharvest tools packages, goods, and supplies. The agro Input shops rarely sell postharvest-related goods. The import taxes and customs issues create disincentives for agri-businesses.
Farmers	Lack of technical know-how on handling practices that can reduce losses; lack of access to improved containers, postharvest tools, education, credit; lack of market information; low prices during periods of high production and lack of knowledge about market options
Traders	High fuel prices and high transport costs (can limit market options), lack of access to cool storage facilities for temporary holding of unsold produce
Transporters	Huge, heavy containers; high fuel prices; poor feeder roads (contributing to vehicle and tire damage); lack of access to refrigerated vehicles; and lack of knowledge on best practices for loading/unloading vehicles
Marketers	Produce exposed to weather, sun, with subsequent high losses; lack of cool storage for unsold produce and lack of access to facilities, power, and equipment for temperature management
Extension services	High costs for travel, lack of proper accommodation; lack of suitable teaching materials on appropriate postharvest technologies; lack of information on local cost/benefits of best practices; lack of working equipment for local travel (e.g. bicycles, motorcycles) and lack of extension kits, field guides, etc.

Source: Compiled from secondary literature review, April 2020

¹⁰⁴ *ibid*

¹⁰⁵ ITC (2016). Investment Profile, Agro-processing and light manufacturing.

¹⁰⁶ Tanzania Horticulture Association (TAHA) 2019

7.2 Climate change impacts

Agricultural production, through the selection of crops and application of best-farming methods, is a climate-dependent bio-industry with notable regional agro-ecological characteristics. Climate change, usually manifesting in extreme and volatile weather forms (drought, floods, increased pest, and disease infestation, etc.), has become a very serious concern for the F&V sector in the region, and has been documented as arising from increased unsustainable human exploitation and consuming fossil fuels, deforestations, heavy unsafe crop farming practices, and industrial livestock farming, among others, that adds enormous amounts of greenhouse gases to those naturally occurring in the atmosphere, increasing the greenhouse effect and global warming.

Among climate change impacts are unpredictable extreme and volatile weather conditions that lead to premature vegetables and fruit senescence, with suboptimal biomass accumulation, increase in vulnerability to pests and diseases, and reduced and irregular harvests and deliveries of raw material to the processors. As a result, climate change translates into higher costs for F&V processors (capacity utilization and adaptation costs), among other impacts in upstream and end-stream value chain sections.

7.3 Limited access to financial services

As with the rest of the developing world, investment to support the production of agricultural produce is severely limited and the smallholder farmers, who significantly produce over 80 percent of the fruits and vegetables, experience a lack of access to finance and other business development services. Farming is a risky business, compounded by issues such as climate change, but the provision of innovative agricultural credit products and services, strengthening financial literacy, and building trust between producers and financial service providers, is key to unlocking both short and long-term productivity gains in this sector.

Because of the lack of financial support, most producers are unable to make the necessary investment in innovative technologies. For irrigating the fields, for instance, most farmers use an open canal system that scores very low in terms of efficient use of water (15%-25%), because they cannot invest in highly efficient systems such as sprinklers (80%) or drip irrigation (90%). Due to lack of access to capital and personal savings, microfinance service providers have been shown to be game-changers in this sector, providing initial capacity for investment in technologies, sustaining access to capital, and a strong business relationship required for continued sector growth.

7.4 Supply chain disruption from pandemics

The COVID-19 epidemic and resulting control measures, including population containment and movement restrictions, have disrupted operations in the sector. Notable effects have been, among others, the insufficient distribution of farm inputs, labour availability, pre-and post-harvest crop losses, supply chain disruptions (transportation network disruptions and market closures).

It has been reported (EABC, 2020) that the F&V sector is likely to incur massive losses in sales revenue from disrupted trade, and resulting idle processing capacity. The crisis has also induced a change in demand for F&V. As a result, the crisis has led to a much-needed reality check. It has shown us problems in our business-as-usual approach and emphasized linkages, risks, strengths and weaknesses. It is becoming clear that the way we produce, trade and organize our supply chains, must change if we want to minimize the short-term consequences and prepare our business for the time after the crisis or any other crisis occurrence in the future. The crisis has also shown that, moving forward, the introduction of innovative technologies to minimize post-harvest losses and to store the F&V for a long time will be much needed. For instance, drying and storage technologies and adding value to F&V by the production of by-products would reduce much post-harvest losses for the fruits and vegetable sector.

7.5 Limited processing technologies for value addition

Currently, the EAC region has not been able to capture significant premium markets, due to limited value addition to its exports beyond primary processing. Increased value addition is particularly critical, given the growing importance of processed fruits and vegetables in the national, regional, and global markets. As pointed in the previous sections, the processed fruits market in the EAC is among the most promising ones, although the industry is still at a nascent stage. Consequently, there is a need to improve technological innovation in this space if EAC is to capture this premium market.

Looking to the future, particularly with regard to fruit juice processing, the most critical challenge will be the availability and accessibility to appropriate value addition technology. This is evidenced from industry data, which shows that currently, the share of F&V in manufacturing is very small (4 to 12 percent), as is the manufacturing value-added per capita.¹⁰⁷ At the moment, the appropriate technology is not readily available. In most cases, the cost of technology is high and, therefore, not affordable to processors. Sometimes the available technology is not relevant to small and medium-scale processors. In addition, efficient and cost-effective dissemination systems for technology are still lacking. For this reason, the region will not be able to capture a significant market share in the global market space if this challenge is not addressed.

Other challenges that also need to be overcome. Across the EAC countries, poor post-harvest practices are a major contributor to the reduction in product quality and shelf-life. There is considerable scope for increased value addition, if fruits and vegetables are processed, or post-harvest handling procedures are improved. The losses occur mainly in the harvesting, handling, storage, and transportation of crops.¹⁰⁸

In addition, the preservation of fruits and vegetables for high-value crops is often difficult, as the raw material base is very expensive. However, any unsaleable fruits and vegetables can be processed into preserved forms of produce. In East Africa, the preservation of fruits and vegetables is often done in times of surplus production, or from substandard produce, thus it is dependent on the performance of the sales of fresh produce. In the long term, the preservation industry will have to establish more reliable sources of raw materials, eventually decoupling this supply channel from that of fresh sales.

7.6 Packaging

Key challenges related to the packaging of food products in the EAC include:

- High rate of change in packaging requirements necessitated by changing consumer preferences and trade-related standards, resulting in high obsolescence costs from high volumes of packaging materials required as buffer stock or to meet minimum order requirements of packaging materials producers and suppliers.
- The cost of packaging materials that meet agreed national and regional standards is often 50 – 70% of the cost of the product, making properly packaged products unaffordable for many consumers in the region.
- The need for long-distance travel on poor road infrastructure and/or delays in transit, increases the loss of products in transit, especially due to poor packaging materials used.
- The packaging knowledge and technology base in the region is still very low. There are no specialized education courses on packaging technology, a requirement for improving the packaging technologies and innovations necessary to meet consumer requirements in the region.
- Lack database of a database of packaging sector stakeholders, packaging materials available and/or underuse, converters, and manufacturers of packaging products, end of line accessories, global players and affiliates, regulators, and research institutions working on packaging.
- Investment promotion initiatives specifically targeting manufacturers of packaging materials.¹⁰⁹

It is important to address the above packaging challenges with investment, however, a phased approach to stimulating investment in packaging is proposed as presented in the strategy section of this document.

¹⁰⁷ The manufacturing value added per capita is dominated by foods and beverages and offering the opportunity for a stronger effect on sector competitiveness, employment and value addition.

¹⁰⁸ Current estimates show that post-harvest loss levels of perishable horticultural products within EAC may reach 30% or more.

¹⁰⁹ Development of Strategic Investment Framework for Agro-industries and related Agribusinesses in the EAC Sub-region. An input to development of E3ADP under FAO Project.

7.7 Marketing

The challenges for marketing the F&V products in the EAC can be grouped in several categories and thematic areas as presented below:

7.7.1 Poor market linkages

The majority of small-scale F&V farmers in the EAC are not connected to the regional and international markets and, therefore, have limited chance to conduct export business themselves. Currently, most of the F&V marketing systems are configured to sell to fragmented ready-to-eat same-day consumption segments.

The fruits & vegetable sector is characterized by the existence of relatively small formal marketing channels, in parallel to a large informal one. As such, there is no adequate linkage between the small-scale production sector and those of the large commercial activities. Some producers have formed groups to produce as contract farmers (out-growers) to large-scale export firms, but this business model has not been adopted on a scale that would warrant economies of scale through the engagement of critical mass of small producers. There are also a small number of aggregators and cooperatives who export directly.

7.7.2 Small market share

The market share for the EAC fruits and vegetable sector is still weak. The industry lacks coordinated efforts to expand the market share at domestic, regional, and international levels. The EAC currently exports less than one percent (1%) of total vegetables in the world market. Furthermore, trends of total exports over the last five years show a declining trend at a Compounded Annual Growth Rate (CAGR) of 13%. This implies that EAC is a marginal player in the world vegetable market.

Table 15: Exports of edible vegetables: A comparative analysis (USD 000")

Exporters	2015	2016	2017	2018	2019	Yearly average	CAGR	Market share
World	66,303,635	70,419,159	72,924,440	71,991,631	71,546,684	70,637,110	2%	100%
EAC Aggregation	727,813	596,442	452,317	518,432	419,319	542,865	-13%	0.77%
Kenya	242,716	264,804	209,156	250,085	224,647	238,282	-2%	0.34%
Tanzania	398,570	255,167	120,498	119,057	162,437	211,146	-20%	0.30%
Uganda	79,638	72,399	110,427	125,817	24,276	82,511	-26%	0.12%
Rwanda	6,842	3,967	12,140	23,468	7,948	10,873	4%	0.02%
Burundi	47	105	96	5	11	53	-30%	0.00%

Source: ITC calculations based on UN COMTRADE and ITC statistics

Within the world market, the market share of fruit exported from the EAC, is estimated at 0.40%. As with the vegetables, the export trends have also decreased over the past five years (CAGR 11%). It should be noted that, while the aggregate export trends have decreased at the regional level, there is a significant expansion of trade value at individual Partner States level: Kenya (CAGR =13%); Uganda (CAGR=25%), Rwanda (CAGR=69%). This may be an indication of increased investment in fruit production activities in recent years. The only exception to this is Tanzania and Burundi. The above analysis implies that EAC is still a marginal player in the world edible fruit market.

Table 16: Exports of edible fruits: A comparative analysis (USD 000’')

Exporters	2015	2016	2017	2018	2019	Yearly average	CAGR	Market share
World	104,873,508	110,974,146	119,651,357	125,843,182	124,836,210	117,235,681	4%	100%
EAC Aggregation	443,660	499,342	740,271	382,428	273,571	467,854	-11%	0.40%
Kenya	125,914	149,792	180,779	232,517	204,428	178,686	13%	0.15%
Tanzania	279,315	343,324	549,801	137,976	57,530	273,589	-33%	0.23%
Uganda	3,879	5,305	8,243	8,638	9,393	7,092	25%	0.01%
Rwanda	203	551	1189	2707	1645	1,259	69%	0.00%
Burundi	34,349	370	259	590	575	7,229	-64%	0.01%

Source: ITC calculations based on UN COMTRADE and ITC statistics

7.7.3 Inability to guarantee consistent and continuous domestic supply of fresh F&Vs

The supply of fruits and vegetables domestically within the EAC is often insufficient, inconsistent, and/or not up to standards to meet the demand of consumers, particularly the high-end market. It has also been argued that the need for markets to be consistently supplied with quality fruit, is the reason for the lack of growth and local consumption in the fruit and vegetable supply chain.

Insufficient planning between market and producers, has led to a supply-demand mismatch. Small-holder farmers face difficulties in accessing markets and in acquiring market information. Farmers rarely operate as farmer groups and endure high production costs due to the lack of scale economies. Expensive transport options prevent delivery to the market at a competitive price.

Most of the F&V farms in the EAC are too widely dispersed or have bad road conditions for buyers to source direct. Accessibility has also prohibited post-audit support activities from the relevant authorities. Extension staff have been unable to efficiently provide training, follow-up advice, and support. The consequence of the inability to find viable markets is post-harvest loss. There are insufficient pack houses and storage facilities in rural areas, dramatically reducing the shelf life and quality of the produce. Likewise, farmers are unable to provide security and are at risk of theft, particularly of high-value goods.

7.7.4 The mismatch between supply and demand of processed fruit juices

Across the EAC, demand for processed fruit juices is growing much faster than supply. Competition from “semi-processed” alternatives¹¹⁰ remains significant, with low-cost and unregulated alternatives such as local banana juices, still the dominant product-market, particularly in the rural and peri-urban setting. Competition from processed fruit juice imports is growing and is projected to dominate target middle-class urban segments in East Africa’s major cities. The level of branding by indigenous fruit juice processors in the industry is very young, but quite competitive.¹¹¹ The processed fruit juice sector has seen young emerging brands compete with well-packaged and better-quality imported brands.

7.7.5 Weak market information systems

Market information within the F&V sector is not well integrated with other information systems – public and private. For this reason, information is not reaching the mass and at times the information is also not very useful. Furthermore, the capacity of the small holder is limiting in terms of access and use. Because most of the current initiatives for information management in the Partner States are donor-supported, the system is therefore not very sustainable.

¹¹⁰ Bottled in unhygienic conditions in cottage industry settings

¹¹¹ A large number of “mom-and-pop” shops that sell poorly bottled juices

Lack of market research results and information is a major problem facing the augmentation of marketing efficiency in the East African F&V sector. The rapid growth of the sector in recent years, requires an efficient market information system. Rapid developments and industry sophistication in the global arena, will lead to increased specialization of functions within the value chain and therefore more demand for coordinated information systems. Furthermore, the development of the sector, along with the high degree of uncertainty in the sector, will increase the complexity of problems, required analysis, and analytical procedures which increases the demand for information. It therefore becomes necessary to establish a marketing information system (MIS), with the ability to collect and analyse data in order to derive useful information that can be used to enable industry actors to make informed decisions.

With the exception of some medium and large companies, who have the financial means to undertake their research (several who are already taking advantage of the expanded market), many SMEs lack tailored and targeted market information on specific segments of the F&V value chain in the EAC, including areas that may have good trade and investment potential. This limitation means that many of these SMEs often lack the confidence to test new regional markets, perceiving entry into these as too risky and/or too costly.

7.7.6 Underdeveloped market infrastructure to support mass production, processing, transportation, and marketing

The existing infrastructure does not cater for the mass production and processing of F&Vs. In particular, there are no special production and processing zones¹¹² dedicated to mass production and processing. There are no “clusters” or organized network of actors (e.g. producers, entrepreneurs, companies, research institutions, and government organizations) who could coordinate the various activities in the value chain to promote competitiveness. Clusters are especially important given the fact that the majority of F&V actors and firms in the EAC region fall under the category of SMEs.

Currently, the region has not been able to create a critical mass of SMEs within the F&V sector. Most SMEs are small and fragmented, making the cost of supporting and coordinating them higher than when they operate as a group. The challenge is further exacerbated by the fact that F&V farming systems in the EAC region are dominated by small, fragmented producers who cultivate less than one acre of land. The EAC region also lacks appropriate “SME parks” and “incubation centres” to cater for expanded production and promote the application of state-of-art technologies and management practices which are key to increased value chain competitiveness.

There is also insufficient market infrastructure (e.g. cold storage warehouses and collection and distribution centres) to facilitate mass marketing and provision of other supply chain services. At present, the F&V supply chain has multi-layered marketing channels, with no significant vertical coordination between key actors. Effective coordination could, for example, bring together farmers either through cooperatives, contract farming systems, and retail chains and ultimately facilitate better delivery of output; reduce market risks; attract more investment; and/ or acquire better extension services.¹¹³ Furthermore, the existing market infrastructure does not promote integration between growers, wholesalers, and retailers into the market system. This prevents multiplier effects that would ultimately increase income, output, and employment.

In addition to the above, there are also challenges related to the logistics and transportation infrastructure. In particular, the post handling systems in the transport infrastructure (railways, posts, airfreight services) do not necessarily cater to the needs of perishable F&Vs – e.g. cold storage facilities, cold rooms for transit goods, and “green” belts to fast-track clearance at the ports. This leads to long delays in clearing goods on transit and therefore more post-harvest losses. It also affects the speed at which products get to the market.

7.7.7 Insufficient local skills and knowledge base

Across the EAC, high-quality skills required by the F&V industry are in very short supply. The major challenge across EAC related to skills, are that most universities and colleges are not producing “job-ready” graduates. Academic-oriented institutions continue to produce graduates that have a relatively broad knowledge, but without practical skills. The assumption is that the industry will train them on the job. Thus, the labour market in the F&V sector continues to be driven towards “broad knowledgeable and job-seeking” personnel, but lacking in the technical and entrepreneurial skills for the personnel to create businesses and jobs in the sub-sector. As a result, most modern production and processing entities within the region are reliant on external consultants.

¹¹² These are generally referred to Special Economic Zones (SEZs)

¹¹³ This is commonly referred to as backward and forward linkages.

Significant skill gaps exist in the following areas: audit and standards accreditation; technology; breeding and seed multiplication, packhouse management, and standard auditing and compliance issues. There is also a lack of managerial and business skills among those graduating from TVET and Industrial Research Institutes, who will ultimately become future employees and/or entrepreneurs.

Limited skills in food processing, maintenance, and operation of advanced technology machinery and equipment, are also a common feature in the industry. In the few laboratories available for food safety, skills in short supply include: i) quality control and product safety procedures (microbiology, chemistry), ii) Hazard Analysis and Critical Control Point (HACCP) system management and implementation, iii) research and development skills, iv) raw material and final product quality testing skills, v) determination of product shelf-life skills, vi) Equipment repair, and vii) Sales and trade.

Skills in fruit husbandry, orchard management, and Good Agricultural Practices (GAP) are an issue affecting all EAC partner states. Business and administrative skills for the fruit juice processing industry are also in short supply. There is also a general lack of awareness and application of fundamental production and processing standards including the following: GMP in processing standards; GAP in production systems and Good Horticultural Standards.

7.7.8 Policies, regulatory and institutional framework

Although the EAC is operating within a common market, largely, the legal regulatory and institutional framework is still a matter for each Partner State. At the regional level, there are no policies or directives specific F&V sector. Efforts to harmonize national regulations across the EAC region have the potential to increase the competitiveness of the F&V subsector.

The F&V sector is currently dependent on a series of individual spheres that often are not well related to each other, thus the need for institution framework with the regulatory mandate for improved coordination across various value chain actors and stakeholders. The individual government policies for the sector, need to be aligned across government agencies and ensure that the private sector has greater room to provide input in setting government policies, to create a better enabling environment and consequently allow the strategy to achieve its goals. The strategy implementation will also need to be closely monitored at all stages. Fulfilment of these requirements will ultimately become a bedrock for the operationalization of the F&V Strategy in the EAC region and across the Partners States.

In terms of coordination, the industry does have some participatory institutions for collaboration, these include cooperatives, NGOs, and some private business and professional associations. These associations offer valued services in many cases, but they have not yet been strong vehicles for achieving value chain vision, consensus, or effective engagement with the public sector or other partners. There are few platforms for private-private or public-private dialogue and decision-making. There are few collaborative platforms for the F&V value chain actors to collaborate for their mutual benefit. However, there is no representative industry-wide forum for the F&V industry at the regional level.

Despite the presence of the trade policies and agreements above, there are several challenges facing EAC countries in order for them to take full advantage, the most critical thing being how to interpret them into action. Specific challenges include trade policies (accession to the World Trade Organization (WTO); and lack of competitiveness (trade facilitation due to trade logistics and cost of transport, quality and standards of products, and availability of services and inputs).

7.7.9 Available services in the sector

Despite EAC's emphasis on industrialization as an engine to drive the regional economies, little attention has been paid to the role of services in value chains and the barriers that exist to accessing or importing these services. Likewise, the increasing contribution of knowledge services, such as research and development (R&D), in industrial value chains, is often neglected. Services play an important role in global value chains (GVCs) and the manufacturing process (often referred to as "serviceification"). An increasing share of value-addition takes place during the early and late stages of the production cycle.



Chapter 8

The EAC F&V Value Chain Strategy

This section presents the EAC F&V Value Chain Strategy, building on the findings of the analysis on the global scene, the dynamics of the EAC region in general, and individual Partner States in particular. The strategy document elaborates key interventions necessary for promoting the competitiveness of the F&V sector. It is based on the premise of the collective commitment of the EAC Partner States to fast track equitable and sustainable development of the region or the benefit of the people of East Africa. Implementation of the Strategy holds the key to unlocking the region's overall economic potential through structural transformation and diversification of the regional economy and development of high potential industrial value chains.

8.1 The Vision, Mission, Objectives, and Outcomes/Targets

8.1.1 The Vision

The Vision is "To be a regionally and internationally competitive fruits and vegetable industry, sustainably contributing to the socio-economic development and transformation of the EAC region, through increased exports, value addition and retention".

8.1.2 The Mission

The Mission is "To increase investment in the EAC fruits and vegetable sector, capable of capturing and retaining more than 50% of the intrinsic (potential) value of the industry, by 2031."

8.1.3 The Overall Objective

The overall objective of the Strategy is "to transform and develop the EAC fruits and vegetable sector from the current nascent, domestic-focused to a robust industry capable of exporting fresh and processed (value-added) products of sufficient quantities and quality."

8.1.4 Development Outcomes/Targets for the Sector (10 Year Timeline)

- Increase in the area under fruits production in the EAC by 5 percent to 10 million hectares, accompanied by 4 percent increase in productivity.
- Vegetable production in the EAC to increase by 5 percent of area cultivated to 45 million hectares, from the current 32.8 million hectares with productivity increasing by at least 3 percent.
- Intra-EAC trade in fruits and vegetable products increases from the current USD 9.9 million to 25 million in 2031.
- Exports to the global market for the vegetable increase to USD 950 million from the current USD 416 million.
- Exports to the global market for fruits to increase to USD 350million from the current USD 125 million.
- Employment opportunities are created along the value chain to the tune of 4,000,000 direct jobs, at the end of 2031.
- Reduction in post-harvest losses from the current 40% to 20% in 2031.
- Increase in the proportion of processed fruits from the current 8% to 16% in 2031.
- SME entrepreneurs trained and supported, particularly in improving productivity, quality standards linking to the global supply chain.
- Increase GDP contribution by fruits and vegetables from the current 36 percent to 50 percent in 2031.

8.2 Strategic Objectives, Results, and Actions

The Key Strategic Objectives for achieving the Vision, Mission, and Goal of the F&V are summarized below.

Strategic Objective 1:	Increase production capacity for fresh and processed F&Vs
Strategic Objective 2:	Strengthen R&D, innovation, and processing technologies.
Strategic Objective 3:	Develop and improve packaging services.
Strategic Objective 4:	Promote market access and trade facilitation.
Strategic Objective 5:	Improve safety and quality infrastructure.
Strategic Objective 6:	Build local skills and knowledge base.
Strategic Objective 7:	Strengthen the coordination, institutional, and policy framework.
Strategic Objective 8:	Promote nutritional and medicinal indigenous fruits and vegetables.

8.2.1 Increase Production Capacity of Fresh and Processed F&Vs

This strategic objective seeks to improve the supply side of fruits and vegetables in the EAC region. The main objective being to ensure a sufficient supply of good quality fresh and processed products. It comprises seven (7) result areas as outlined below.

8.2.1.1 Facilitate timely access to quality productive inputs

The program actively seeks to improve the accessibility, availability, and affordability of farm input across the EAC region. F&V production requires consistent access to quality inputs, (seeds, fertilizers, agrochemicals, and biological control agents).

Below are the key actions for this program.

(a) Facilitate the establishment of certified seed and planting materials nurseries

This action seeks to facilitate the establishment of certified nurseries to ensure the availability of good quality seed and planting material in the EAC. It will ensure that nurseries in the EAC supplying seed and planting material cultivars that are demanded in the international market. The existing public orchards within the Partner States, will be strengthened and maintained as sources of quality planting materials. Private nurseries supplying quality planting materials should also be identified, promoted, guided, and regulated to ensure that farmers are getting quality planting materials. Likewise, current seed sources and research efforts will be reoriented to suit the dynamic needs of the industry.

NB: Nurseries are certified by accredited bodies. For example, if a particular business entity wants to certify a seedling nursery with GLOBALG.A.P, it needs to find a company that is accredited by GLOBALG.A.P to audit the nursery. The same company will provide certification.

(b) Develop an integrated approach to microfinancing, climate change, and food security

Dedicated funding is required to transform the F&V sector for significant productivity improvements that will motivate mid-stream investment (processing). This requires an integrated multi-sectoral approach, that enhances investment in productive technologies, micro-financial management training, and climate-smart agriculture. Part of the approach requires the inclusion of the private sector to connect growers to markets and financial services. Strategic facilitation of partnerships among microfinance service providers and other institutions can ensure scaling up of financial literacy and continuing to foster national- and private sector-led ownership improving F&V sector initiatives that connect climate-smart agriculture, microfinancing, and food and nutrition technical assistance.

(c) Streamline input registrations and distribution process across the region

Harmonisation of the laws on inputs registration among all EAC countries is required.¹¹⁴ Examples of key changes include:

- Fast track harmonization and implementation of EAC Seed and Plant Varieties Bill and EAC Fertilizer Policy and Fertilizer Bill
- Review critical regulatory issues in major Acts in respective Partner States where applicable;¹¹⁵
- Support implementation of EAC harmonized guidelines for testing and registration of pesticides and address regulatory frameworks hindering usage and accessibility of innovations and technologies. For example, tax exemptions to modern inputs e.g. Biological Control Agents (BCAs); and
- Improve Government input inspection mechanism at the points of entry and on agro vets. Laws and regulations to govern agriculture input inspection at different levels in the region should be enforced.

¹¹⁴ Agriculture inputs include seeds, fertilizers, pesticides, machines, tools, equipment etc.

¹¹⁵ For example, Plant Protection Act 1997 and other Acts e.g. TPRI Act for Tanzania

(d) Promote value chain development strategic products in the F&V sub-sector

This action seeks to identify a selected set of value chains from specific products, which can be given more propriety in production to increase the supply base. It is premised on the fact that different areas have different production potential. Essentially, it involves ring-fencing the top EAC F&Vs and the provision of targeted interventions.

8.2.1.2 Address pre-and post-harvest challenges

The program seeks to improve the primary handling and processing of the F&V raw materials to enhance shelf-life to enable trade within the national borders, across, and beyond the region.

Post-harvest best practices include, for example, best harvesting practices (use of maturity indices, tools to prevent damage, gentle handling); use of shade; use of improved packages (smaller containers, plastic crates (farm to packhouse); improved grading, packing and packaging practices (packhouse to market); quality standards (domestic versus export); integrated postharvest pest management (IPM); temperature management (use of cooling practices, cold chain management, handling mixed loads during cold storage and transport) and food safety practices (GAP).

8.2.1.3 Strengthen the extension services

The program activity seeks to improve yields of F&V in the EAC. The activity will ensure that producers apply good agronomic practices (GAP) to ensure optimum output per unit area of land. The intervention is particularly relevant, given the small and fragmented nature of F&V production where an average smallholder farmer owns less than 2 acres of land.

There should be continuous **capacity building**, including exposure learning to Public and Private Sector Extension Agents especially in the area of Good Agriculture Practices (GAP), Integrated Pest Management (IPM), Sanitary and Phytosanitary System (SPS) Inspectorate, etc. to cope with the industry dynamics. Options for the digitization of extension services should also be considered.

8.2.1.4 Improve product quality and safety standards for the local market

This program activity seeks to ensure that fruits and vegetables offloaded in the local market, meet food safety and quality standard requirements. The key areas of focus for this program activity are presented below.

(a) Revitalize and establish consumer protecting bodies

This regulatory entity will oversee the quality of products being released to the local market. Consumer laws are intended to prevent businesses from engaging in fraud or specified unfair practices, to gain an advantage over competitors or to mislead consumers. They may also provide additional protection for the general public which may be impacted by a product (or its production) even when they are not the direct purchaser or consumer of that product.

(b) Promote the sale and distribution of chilled products

Partner States should consider promoting the need to sell and distribute chilled F&V products, with a view to enhancing food safety. In particular, options for establishing collection centres where products can be assembled and chilled should be considered. These could take the form of consumer cooperatives or other PPP arrangements. The initiative should be coupled with "targeted" investments in knowledge on the advantages of consuming chilled products. Awareness campaigns to the general public, targeting consumer behaviour and quality and food safety issues, should be an important component of these efforts. This is expected to "demystify" the "myth" of the chilled product as being of poor quality. Other options include the establishment of "solar" powered mobile kiosks¹¹⁶ for the distribution of horticulture products for the "mass" market.

(c) Strengthen the institutional and legal framework on food quality and safety

Consumer protection frameworks cover a range of institutional mechanisms which include consumer, being the subject of these guidelines. Respective Partner States have an important role to play in ensuring the consumer protection functions effectively and in a way that does not shackle the freedom of businesses to operate legitimately or stifle the freedom of consumers to exercise individual choice.

The essential elements of a consumer protection framework are as follows.¹¹⁷

- National and regional consumer policy that sets out the approaches of the Government towards consumer protection, enumerates the rights of consumers and apportions responsibility for consumer protection to appropriate official organs

¹¹⁶ These are widely used in Nigeria

¹¹⁷ This section borrows from the 2016 edition of the UNCTAD Manual on consumer protection.

- A designated consumer protection agency responsible for the development and application of consumer protection, whereby an agency can collaborate closely with the different relevant ministries and consult with other stakeholders such as consumer organizations, businesses, academics, and the media.
- Establish Horticulture Industry Code of Conduct

This will include, for example, products to be supplied to the local markets; minimum residue levels and hygiene standards; food safety issues (e.g. list of approved chemicals) etc. These efforts should be linked to the agro-processing segment, to ensure safety throughout the supply chain. There is also a need to strengthen the enforcement system, in particular, the crop inspection system. The existing systems for weight and measures should equally apply to the F&V sector. At the moment, there is no elaborate system in the sub-sector.

8.2.1.5 Improve product quality and safety standards for export markets

This program activity seeks to improve the quality of horticulture products entering the export market. It will address key challenges of upholding standards (e.g. Good Agriculture Practices (GAP) and Maximum Residue Levels) and therefore allow bulking and traceability of volumes, particularly for smallholders. It will also allow the standards to be frequently updated and offer support to smallholders in understanding and meeting their requirements.

The key areas of focus for this program activity are presented below.

(a) Develop strategic networks of smallholder farmers networks

This intervention will involve developing networks between small- and large-scale farming operations. Several large-scale farmers and processing companies across the EAC have already facilitated small farmers to meet global standards. These networks have laid a solid foundation for quality improvement standards and systems, and as such, they need to be strengthened. This program activity will be further explored under market linkages proposals.

(b) Promote public and private investments in large-scale operations

Investments made by public and large private companies have facilitated the achievement of quality and standards required by export markets.

(c) Capacity building of actors in required quality standards

This intervention focuses on: (i) Best practices to provide the level of consumer protection necessary to ensure food safety for the competitive export market; and (ii) GAP and best value addition practices awareness and capacity building to both government officials and private operators, such as food producers and processors and establishment of active consumer's organization to advocate the improvement of food safety; (iii) Capacity building on the international standard for the export market including certification, (iv) promoting the establishment of certifying agents across the region.

(d) Establish a regional food quality advocacy platform

Typically, consumer organizations are a driving force behind food safety policy. Each of these organizations advocates food safety in a different way, whilst one may focus on presenting information through science and research, another focuses on showing the real-life impacts of foodborne illness on families, and yet another focuses on consumer education. In general, all of these organizations work to make food safer.

8.2.1.6 Incorporate targeted measures to improve the resilience of the sector

This program activity seeks to equip value chain actors, particularly the smallholder farmers, with necessary measures to safeguard their livelihoods and business operations against unforeseen events and natural disasters (including floods, drought, and other adverse weather conditions); increase in the incidences of pests and diseases and health-related conditions. All these factors increase financial losses for value chain actors, for example, the COVID 19 pandemic has negatively affected exporters of flowers, fruits, and vegetables across the EAC region. Going forward, value chain actors need some degree of protection against these incidences. The intervention is premised on the fact that a competitive horticulture industry in the EAC is a function of stable households, firms, and business entities that are engaged in various activities along the value chain.

Below is the key action for this program activity.

(a) Develop and mainstream sectoral climate change adaptation and mitigation strategy

Efforts must be focussed on reducing the scale of climate change through mitigation and adaptation measures. While mitigation is about preparing the sector to absorb climate change variability and thus reduce the shock, adaptation to climate change is also a countermeasure against climate change. It consists mainly of helping communities and ecosystems to cope with changing climate conditions and impacts (damages and losses).

i) Mitigation:

These are countermeasures that the F&V sector adopts to reduce the scale and rate and absorb the impacts of climate. Mitigation measures for the agricultural sector, include the improvement of field production practices through improved irrigation (micro-irrigation), fertilization control, climate-smart agriculture, protected production systems, innovative management of crop and animal wastes, carbon sequestration measures, among others. Some of the best-practice strategies for climate change mitigation involve developing relevant policy programs and appropriate portfolio approaches using a policy mix, including:

- Economic: policies that utilize market mechanisms, such as charges, carbon tax, emission trading scheme, and subsidy;
- Regulatory: Examples include emission cap, chemical fertilizer spraying standard, manure, and liquid fertilizer spraying standard, and breeding density regulations;
- Voluntary agreements: non-regulatory policy measures such as Good Agricultural Practices (GAP) and voluntary development of resource-recycling villages by growers and processors.
- Research and development.
- Information dissemination and promotion of public awareness

ii) Adaptation:

Climate change adaptation (IPCC, 2007) is defined as "adjustment in natural and human systems in response to actual or expected climatic stimuli and their effects." UNFCCC defines adaptation as "regulating process of ecological and socioeconomic systems to reduce possible damages from actual and expected climate change, that is, actions are taken to help communities and ecosystems cope with changing climate conditions.

Adaptation contributes to reduce the negative risks of climate change and provide opportunities to use climate change for positive effects, it plays an important role in mitigating the impacts of climate change. Adaptation includes both actions taken to directly mitigate the damages from the climate and enhance the future adaptive capacity and actions to contribute to indirectly mitigating the damages from climate change. Climate change adaptation strategies to consider are:

- Research and development (crop development, meteorological and climate information system, resource management innovation),
- National government programs and insurance (agricultural subsidies, private insurance, resource management program),
- Agricultural production techniques (agricultural production, land utilization, irrigation, cultivation time control), and
- Financial management for farm households (crop insurance, crop future trading, income stabilization program, household income).
- Establishment of crop insurance schemes.

Insurance schemes are important, due to the perishable nature of horticulture products, weather index natural disasters and market fluctuations, among others. Without an insurance system, their degree of vulnerability¹¹⁸ increases significantly. The design of appropriate insurance schemes will differ from country to country and will be on a case-by-case basis, but in general, it will seek to address the following demand and supply barriers.

¹¹⁸ "Vulnerability" is the inherent fragility of poor people's livelihoods, which makes them unable to cope with stress and less able to manipulate or influence their environment to reduce those stresses (or benefit) even when trends move in the right direction. This definition establishes three criteria for household vulnerability namely: poor ability to cope with stress and shocks; less ability to influence the environment to reduce stresses; and inability to take advantage of an improvement in environmental conditions.

Table 17: Demand- and supply-side barriers to the uptake of agricultural insurance

Demand-side barriers	Supply-side barriers
Low awareness of insurance	Insurance services for smallholder farmers can be costly and complicated to design
Low trust in the provider and the chance of receiving a pay-out	Distribution and operations: smallholder farmers are expensive customers to acquire and serve
Poor understanding of how insurance works	Low profitability potential due to low premiums
High cost of premiums and lack of government subsidy	Difficult to provide some policies without government support and subsidies
Difficult to register and claim, which requires extensive traveling to a point of service offered	
The insurance cover on offer is not needs-specific	

Source: Authors compilation, various sources

8.2.2 Strengthen R&D, innovation, and processing technologies

This Strategic Objective seeks to promote Research and Development (R&D) activities in the value chain, with the view of fostering increased innovation, availability, and accessibility to appropriate value addition technology within the F&V subsector. Specific actions for addressing technological barriers, as well as upgrading the existing technologies, will be presented. Options for facilitating investments in processing activities are also considered.

8.2.2.1 Support R&D Institutions in the F&V sub-sector

This intervention will offer “targeted” support to the Research Development Institutions supporting the F&V sector, to build the capacity to produce globally competitive products through efficient production, processing, and marketing processes.

Below are the key actions for this program activity.

(a) Use technology and innovation to improve the quality of products put on the market

Support from the innovation and technology development institutions, will mainly focus on creating and disseminating F&V management systems and databases; product conceptualization, through prototype testing with a strong emphasis on the technical aspects of product functionality in the marketplace, and in particular how they are tailored to meet the consumption patterns of target clientele/ market segment.

(b) Use technology and innovation to increase the commercialization rate of processed F&V products

Research and development efforts can play a big role in this area, through building the in-house capacity to support end-to-end product development and commercialization, through strong partnerships with other institutions and service providers to address both the technical and commercial needs of the industry.

(c) Commercialize appropriate innovations into business opportunities

This action can be achieved through the promotion of initiatives aimed at developing vibrant industry “clusters”¹¹⁹, where the targeted products can be quickly converted into business opportunities and utilized by the targeted clientele and/or markets. This proposal is premised on the fact that the utility of innovative products in the F&V sector, depends on the degree to which the innovations are converted to business opportunities and, in particular, their ability to attract a critical mass of consumers in both the local and international markets. This also includes premium consumers in the niche markets.

¹¹⁹ Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region. In other words, a cluster is a system of interconnection between private and public sector entities. It usually comprises a group of companies, suppliers, service providers, and associated institutions in a particular field, linked by externalities and complementarities. Clustering is internationally recognized as the best way to pro-actively address sector development and stimulate economic development.

(d) Enhance technology transfer¹²⁰

Scientific and technological developments will be made accessible to a wider range of users, who can then further develop and exploit the technology into new products, processes, applications, materials, or services. Technology transfer will: increase access to information on new technologies and innovations in the industry; increase the linkage between these institutions and industry; establish long-term mutually beneficial partnerships, and contribute to increased human resource skills base for industry development in the region.

To achieve the objectives of investing in product development, partnerships between R&D selected institutions and related services providers, need to be engaged: The partnerships should involve the following actors: major Industrial Research Institute in each EAC Partner State; academic institutions with a strong history and reputation for supporting agro-food industry development; government agencies from each Partner State involved in product and technology development and/or IP registration; specialized BDS providers with interest and capacity to support entrepreneurs in the commercialization of agro-processing business ventures; selected commodity-specific business associations and/or multi-stakeholder platforms. Given the fact that technology development is a support function, investments in enhancing the contribution of these institutions must leverage investments by the private sector and other partners, particularly those seeking to increase access to regional and international markets, where value-added products can find an outlet and have a stronger imperative to compete.

(e) Establish regional technology and innovation laboratories that meets international standards

The laboratories will offer key diagnostic services in the region, including plant health diagnosis, soil, and water testing, etc. The intervention will reduce the cost of accessing these services where samples are sent to other countries for testing and diagnosis. In this way, services will be more accessible to small-scale farmers. Options for upgrading some existing laboratories to internationally accredited status will also be explored.

(f) Enhance and secure Intellectual Property registration and enforcement mechanisms

The technology and innovation support institutions need to be supported with appropriate mechanisms for their innovations to be protected. This can be achieved by developing appropriate regulations and procedures on Intellectual Property (IP). While individual EAC partner States have established IP laws that generally meet international standards, weak enforcement continues to frustrate efforts to protect IP in the region.

This proposal is premised on the fact that industrial value chain processes no longer dominate value creation. Today it is innovation, it is seeking new ways of meeting market demands that are yielding the highest return on investment. This means that technology and innovation institutions in the EAC region will have to invest in their Intellectual Capital.¹²¹ Intellectual property rights (IPR) protection is generally assumed to stimulate innovation and growth. This can be through providing incentives for innovative activities by domestic firms, but might also be due to a higher level of technology diffusion from abroad.¹²²

(g) Promotion of circular production systems

This action seeks to ensure the circulation of raw materials within the value chain in different processes, in such a way that an output for one process becomes an input for another process, or a waste for one process becomes an input for the other. It is also a way of using resources more efficiently and also integrating technology solutions.¹²³ The intervention can also be looked at from the context of R&D on green-farm-gate technologies, which seek an increased use of alternative renewable energy options.

(h) Use innovation to diversify products

This action seeks to promote increased utilization of the current production base to process different alternative products. It ensures optimum utilization of the raw material base. Different products can be considered, for example, banana wine, tea, beer, shampoo, animal feeds.¹²⁴

¹²⁰ Technology transfer (TT) refers to the process of conveying results stemming from scientific and technological research to the marketplace and to wider society, along with associated skills and procedures, and is as such an intrinsic part of the technological innovation process.

¹²¹ The above argument is also backed by research findings which shows that today, there is much evidence that intellectual property rights (IPR) protection stimulates trade flows between countries. The effect is stronger for technology-intensive products. The impact of IPR protection on manufacturing imports is significantly stronger for products with greater technology embodiment, as measured by their R&D intensity. An increase in the level of IPR protection leads to 22 per cent faster increase in the value of imports of products at the 90th percentile of R&D intensity than products at the 10th percentile- Source: Microeconomic Analysis." *Annals of Economics and Statistics*, 107/108: 201–238

¹²² Duguet, E., & C. LeLarge. 2012. "Does Patenting Increase the Private Incentives to Innovate? A Microeconomic Analysis." *Annals of Economics and Statistics*, 107/108: 201–238.

¹²³ For example, in the context of the global agri-food chain, the "circular" economy aims to reduce waste while also making best use of the wastes produced by using economically viable processes and procedures to increase their value

¹²⁴ This concept is commonly referred to as industrial symbiosis

(i) Conduct sensory studies for product acceptability

This action seeks to encourage production, which meets consumer preferences. The objective is to map out consumer preferences, through the surveys, and use the results to promote products, which are most preferred by particular consumer segments. The intervention is expected to increase the use of locally made F&V products as well as uptake of indigenous F&Vs.

8.2.2.2 Address technological barriers

This intervention will focus on addressing technological barriers, particularly to small and medium-scale processors. It considers the emerging stage of the processing industry in the region and, therefore, the need to start from basics. The activity will focus on three areas: (i) ensure affordable, efficient, and cost-effective technologies are developed; (ii) ensure the available technologies are relevant to small and medium-scale processors and (iii) ensure efficient and cost-effective dissemination systems for technologies.

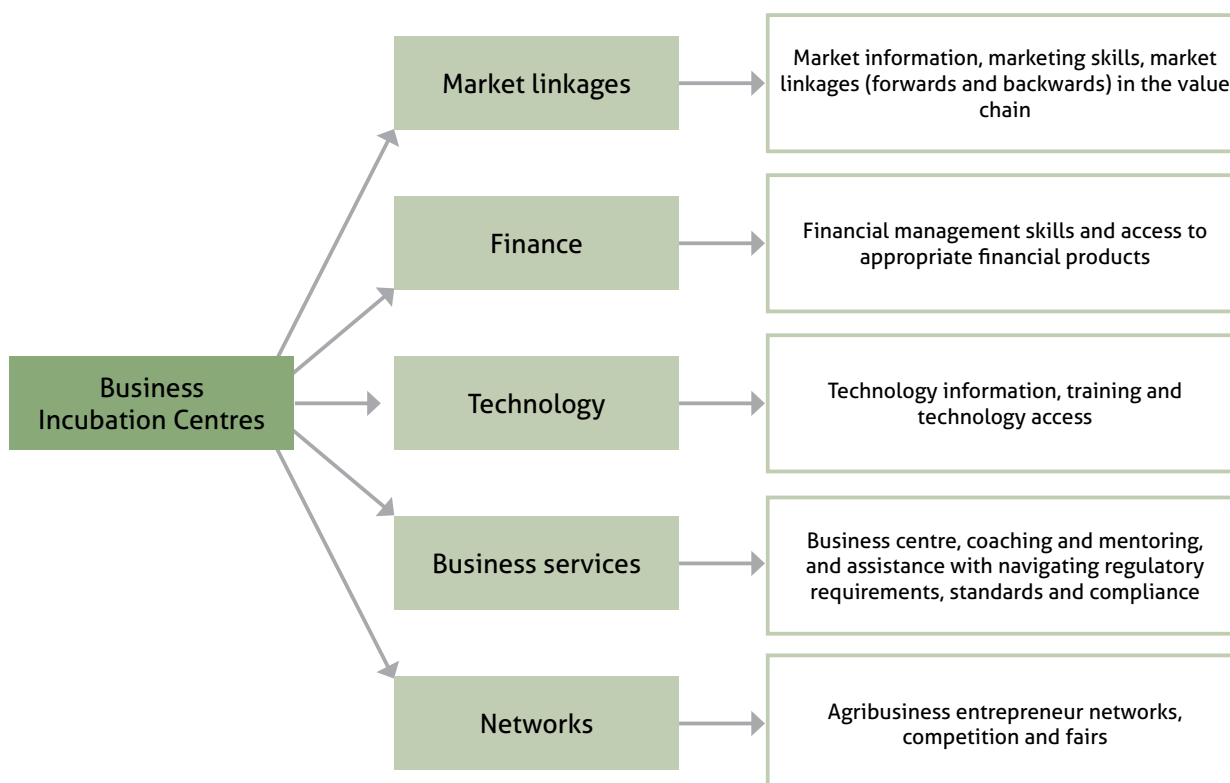
Below are key actions to address technology barriers.

(a) Provide targeted technological support to small scale processors across the region

In order to optimize the benefits of technology and innovation development systems, there is a need for strategic effort in establishing technology transfer facilities in the region, specifically targeting small-scale processors. Small-scale F&V farmers have limited capacity to process fruits to create end-products with much higher market value.

One of the tested models for implementing the proposed support is through “incubation centres.” The “incubation centres” can provide support and services for newly established processing firms at the very early stage. Most incubators share the common purpose of nurturing young companies, helping them survive and grow during their vulnerable start-up phase. The incubators will provide a supportive environment designed to ‘hatch’ businesses. The main aim is to give the new firms best possible conditions for their survival and growth. Business incubators will nurture the development of entrepreneurial companies, helping them survive and grow during the start-up period when they are most vulnerable.¹²⁵ Capacity building in other areas such as labelling, entrepreneurship, and marketing, will also be provided. There is already ongoing work in the respective Partner States, but still at “small scale” and “pre-commercial” level. These efforts have to be intensified. The small-scale processors have to be supported to graduate to a “commercial” level.

Figure 24: The business incubator model

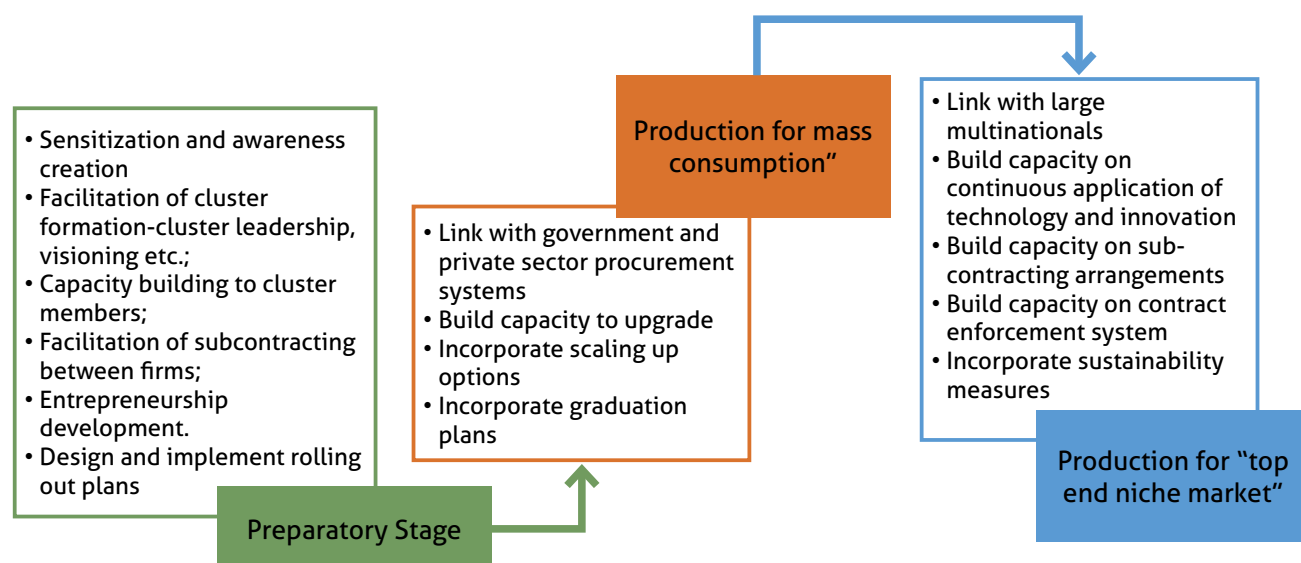


¹²⁵ Dev Business Incubation, Definitions and commonly used terms - www.idisc.net/en/DocumentArticle.38688.html

(b) Reinforce Public-Private Partnerships to drive technology to a wide range of SMEs

A major option for operationalizing the partnerships is the “cluster” model. The Cluster Model is very relevant for promoting “downstream” activities in the F&V subsector. Clusters will jumpstart the promotion of local value addition, thereby fostering the competitiveness of a value chain. They will also address the challenge of fragmentation of processing activities and increase linkages among stakeholders. Through the clusters, there will be a coherent and shared competitiveness strategy by the private sector, governments, and other support institutions.¹²⁶ The initiative could be leveraged with experience from key technology-based public institutions in each country. The proposed partnership will create avenues for creating an enabling development for technological innovation. Options for “off the shelf” technologies should be continuously explored. The proposed cluster model should be “geographically” cantered. Different clusters can be developed within the main production areas in each Partner State.

Figure 25: Business model for promoting industrial clusters



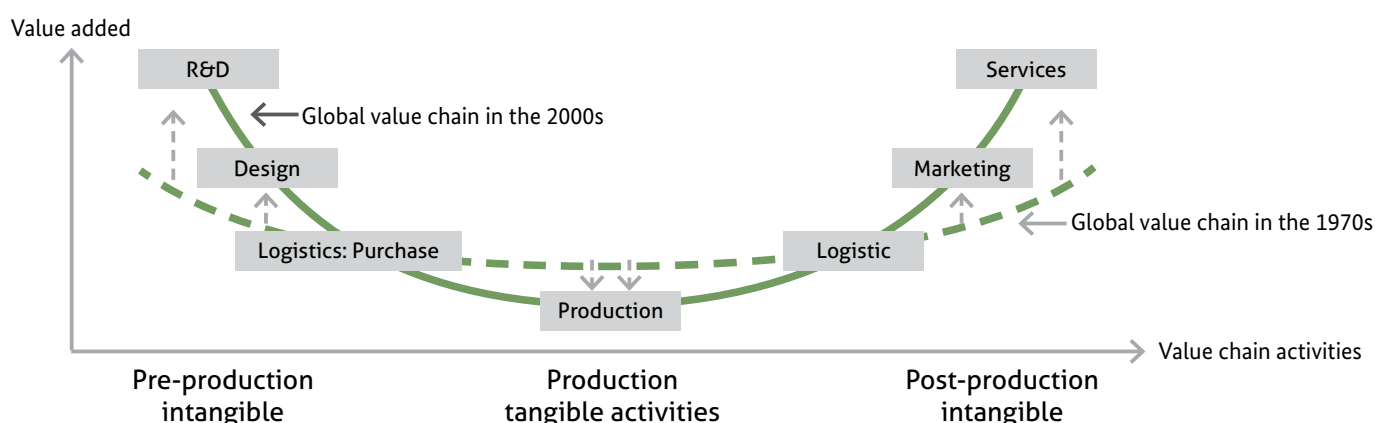
(c) Facilitate availability of key services in the value chain

Access to critical services will support the emergence of a robust F&V sector in the EAC. Examples of key services include Research and Development (R&D), product design, information, and communications-based (ICT) services, business support services (e.g. transport and logistics; market requirements (e.g. packaging, products form, consumer preferences, appropriate branding efforts, etc). The objective of the intervention is to ensure these services are available within the region at affordable costs. This will reduce the dependence on imported services within Partner States; facilitate participation in the regional and global value chains, and ultimately increase value chain competitiveness.

The smile curve on the next page, illustrates the types of service that are used in the production of key industrial value chains. It shows how the distribution of value-addition has changed between the 1970s and the 2000s. The curve highlights two important trends. Firstly, it shows that the highest amount of value addition takes place at the two extremes of the value chain - in the initial R&D and design phase, as well as in the post-production phase (i.e. logistics and marketing). Secondly, it shows how value addition in production itself has declined overtime, with service-related activities becoming increasingly important from a value-added perspective.

¹²⁶ This intervention should be done in conjunction with respective Partner States preferably under the Local Economic Development (LED).

Figure 26: Smile curve and GVCs



Source: "Interconnected Economies Benefiting from Global Value Chains", OECD 2013

8.2.2.3 Upgrade the existing technologies

This intervention will support the upgrading of technologies used in the processed F&V sector. It is more relevant to small-scale processors, who largely depend on local sources compared with medium to large-scale processors, who tend to rely on imported technologies.¹²⁷ The demand from small-scale processors has tended to drive the response in these institutions to demand upgraded technologies. The upgrading efforts will also require significant investment in Research and Development (R&D) in order to develop technologies, which are more efficient and cost-effective.

To support upgrading efforts, a two-pronged approach is proposed:

(a) Improve access to locally sourced processing technologies

This action calls for investment in: (i) improving the standardization of locally fabricated technologies (including for some of the imported parts used in fabrication), (ii) increasing the ability of locally fabricated technologies to better fit into more automated agro-processing facilities where agro-processors are looking for increased efficiency, (iii) improving the human resource and skills of local fabricators e.g. through the Technical and Vocational Education Training (TVET) system, (iv) increased access to stable electricity.

(b) Support the medium and large-scale processors to increase access to appropriate imported technologies

This requires investment in the following: (i) Increased access to stable energy, (ii) improving the human resource and skills of employees to utilize and maintain advanced technologies e.g. through the TVET-academic schooling system, (iii) enhance the capacity of industrial research and technology development institutions in the region to produce high-quality spares and parts for imported technologies e.g. motors (domestication of existing technologies), and (iv) increased access to appropriate finance for acquisition of high-end processing technologies and facilities.

8.2.2.4 Facilitate investment in processing activities

This program activity specifically calls for increased investment in processing activities within the F&V value chain. Considering the burgeoning stage of the industry, processing can be viewed as a lever of change, which can propel the industry to the next level. The investment can take several forms, e.g. production of raw materials, processing equipment, facilities, R&D, technologies, e.tc. For example, the regional fruit juice market is growing as a result of a growing population, growing economic output, and an expanding middle class. There is a need for a concerted effort by the EAC, as well as the individual partner States, to intensify efforts to attract FDI in this value chain segment.

¹²⁷ According to Kilimo Trust, 2013 In the EAC, about 50% of agro-processors are importing these technologies from outside the region while up to 43% are sourcing technologies from within their countries of location as locally fabricated equipment and machinery. Over 90% of the technologies sourced locally or imported are considered capital rather labour intensive, and are sourced mainly to improve the functionality of agro-processing: (i) either to perform more integrated or automated processing or (ii) increase the throughput (per unit quantity processed)

The following interrelated actions are proposed.

(a) Identify specific F&V products for the pilot processing scheme

This action is very important to jumpstart upstream and downstream value addition activities. It seeks to pick quick-win processing activities within the value chain so that value can be added to products immediately they are harvested. This can also be viewed as the initial stages for addressing post-harvest losses. The activity could also involve the identification of F&Vs, which have multiple uses and link them to the manufacturing processes.

(b) Conduct targeted campaigns to attract investment in processing activities

This action will “unveil”, “profile”, and “showcase” investment opportunities within the sector in general and those of the specific segments in particular. The opportunities will be “pitched” via appropriate messages, relevant to the targeted clientele/audience. Critical information of the package may include, for example, opportunities for value addition; product range; market conditions, business, and regulatory environment; key players; and ongoing initiatives to improve the business and regulatory environment. The latter may include incentive packages and/or other efforts for reducing the cost of doing business and creating a favourable and predictable business environment. A candid description of key challenges crippling the sector and efforts made in addressing them is also very critical for the audience.

(c) Facilitate the establishment of Special Economic Zones (SEZs) for F&V processing

The EAC Secretariat, in conjunction with the Partner States, should facilitate the establishment of Special Economic Zones (SEZ's) for F&V processing activities in selected areas within the EAC with optimal production potential. Amongst other things, the SEZs will ensure that the products are developed to meet international food safety standards in addition to meeting clients' demands and expectations.¹²⁸

In order to strengthen the implementation of this proposal and in particular to increase its impact, the Investment Promotion Agencies in the respective Partner States should facilitate investors' access to land and permits for the development of large-scale processing activities. In particular, they should plan to offer generous tax incentives and other incentives to investors who set up operations in the established Processing Zones. Given the “infant” status of the F&V processing activities in the region, this can be a medium to long-term objective once the production activities gain enough traction on the ground.

(d) Identify appropriate options for value chain financing in processing activities

In addition to the efforts to attract external financing, there is also a window of opportunity for attracting investment within the value chain itself. Some value chain financing models should be considered as highlighted below.

Option 1: Introduce a “catalytic” fund/endowment fund

This approach entails earmarking and/or ring-fencing a certain proportion of proceeds accruing from different levels of value addition as a “special levy” to cater to the required investment in the value chain. The model is especially relevant for the F&V value chain, owing to the intrinsic opportunities (i.e. incremental benefits) for value addition. The approach to this proposal may differ from country to country and, as such, should be adapted on a case-by-case basis.¹²⁹ Once this model is adopted, the catalytic fund will become a “premier” fund for developing the F&V subsector across the EAC region. It should be considered as a sustainable way for funding the sector through value addition processes. This can also be considered as an “embedded” approach for encouraging more value addition activities in the industry. The sustainability element will take effect since funds will be flowing “cyclically” thereby building an “endowment fund” for the value chains.¹³⁰

¹²⁸ SEZs refer to a policy concentrate designed to increase growth by creating an economic environment, which offers significantly better investment and operating conditions than the rest of the domestic economy and ensures that conditions of international competitiveness are created. SEZ refers to a geographical region that has economic laws that are more liberal than a country's typical economic laws, and in many cases, it offers high-quality infrastructure facilities and support services and allows duty-free imports of capital goods and raw materials.

¹²⁹ The proposal requires Partner States to carry out an in-depth analysis of practical possibilities in their local contexts. They should then develop regulations which require a “fixed” proportion of money received by national governments (through the Treasury) to be plowed back to the industry for the purpose of funding the initiative.

¹³⁰ An endowment fund is a financial asset, which contains capital investments and related earnings leveraged to fund a specific mission. In this case, the F&V sector development program

Option 2: Establish a “Revolving Fund” for the subsector

This proposal calls for the establishment of revolving funds as capital for funding targeted investment activities in the value chain. The revolving fund should be financed by its users, i.e. individual firms, Partner States, or both.¹³¹ The revolving fund for the F&V subsector should be established with the intention of it being self-sufficient and sustainable after a certain period. Its capital is expected to remain at a constant level, more or less, without any fresh external financing.

Option 3: Promote Public-Private Partnership (PPP)

This proposal calls for the joint investment between the Public and Private sectors in financing the F&V sector. The proposal is based on the premise that the private sector can work together with the government as business partners. The key principle is that better value for the initiative can be achieved through leveraging public and private sector financing. This requires the identification of ‘win-win’- opportunities. It should, however, be noted that there is no universal norm as to the most appropriate approach to PPP in the context of the F&V sector. That analysis needs to be made on a country-by-country and project-by-project basis.

8.2.2.5 Use of technology and creativity to attract youth in the horticulture sector

This program activity seeks to address the fundamental challenge in promoting youth-based horticulture enterprises in the EAC region. It is based on the fact that the agriculture sector, in general, is not perceived to be attractive to the youth. Therefore, both ‘strategic’ and ‘targeted’ efforts need to be in place within the horticulture sector to make it attractive. The emerging sector will not be able to meet its potential for growth if it cannot increase its productivity and create opportunities for young people to integrate into existing initiatives.

The following activities are proposed:

(a) Application of ICT solutions in horticulture

The rapid development of Information Communication Technology (ICT) has exposed rural youth to fast-moving world, even those who do wish to engage in horticulture would want to practice modern systems that use more technical skills and less energy to produce. The development of the telecommunication sector has, for a short period, changed every aspect of young people’s life, even in rural areas within East Africa. For example, the mobile financing service is widely used by young people in rural and urban areas. They can track and transmit important information for the F&V sector.

There are several other ICT applications relevant to the F&V sector for example:

- The collection and compilation of geospatial data for use in addressing post-harvest losses,
- ICT mechanisms for stock tracking in the input distribution systems;
- Call centres for the provision of “real” time information between local actors and big global actors.

The models above are examples of the types of innovation that youth would want to be applied in the F&V sector in order for them to see this as an exciting and potential career (job) to make living, even in rural areas. Against this background, the Strategy should continuously consider scope to embed ICT-based interventions, which can attract more youth in the sector, but most importantly provide a reliable source of revenue. The intervention will ultimately become a “game-changer” in the F&V industry because the youth population will become “future” actors in the value chain, therefore contributing to the sustainability of key interventions being proposed under the Strategy. In summary, the youth population will take the interventions to the next frontier. Youth-based interventions can also focus on providing technical assistance, business development skills, and services in specialized crops like flowers, spices (e.g. chilies, vanilla, ginger), and processed fruits (e.g. mangoes, pineapples, etc) in adding value addition to these crops.

8.2.3 Develop and improve product packaging services

This strategic objective seeks challenges related to the availability of good packaging materials. In order for F&V products to obtain an increasing market share in the local and international market, they need to be packaged in quality materials, which meet international standards.

¹³¹ It should be noted that the fund may take time to become fully established if it depends on small injections of funds in the form of contributions, savings deposits or phased donor financing. For this reason, Partner States may consider earmarking a certain percentage of the national budget to cater for the fund. Contribution from the manufacturing firms should be in form of a special “levy” to be earmarked for the purpose of F&V subsector. Companies (manufacturing firms) will be encouraged in contributing a certain percentage of their earnings into a common kitty.

A key program activity for the strategic objective is to promote local manufacturing of quality packaging materials. This program activity seeks to enhance investment in packaging materials, with the view to increasing market access for primary and secondary processed products produced in the EAC. The objective is to ensure the availability of quality packaging materials locally. Research has shown that the packaging of food products, produced within developing countries, can increase access to regional and other export markets, reduce the proportion of consumer goods imported into the and influence consumer preferences even in distant markets.¹³²

With regard to the above, the following actions are proposed.

(a) Identify existing good quality packaging materials for regional use

This action will make an inventory of the available good-quality packaging materials in the region, which will enable actors to plan for the purchase of stock that meets their production requirements.

(b) Awareness creation on the existence of good quality packaging material in the region

This action seeks to maximize opportunities for utilizing the already available packaging facilities within the region. It is proposed in recognition of the fact there are some Partner States whose packaging industry is relatively advanced compared to others although in general, the industry is at an emerging stage from the regional perspective.

(c) Promote the use of environmentally friendly packaging materials

This action seeks to ensure that the industry adopts green technology in packaging materials. This will ensure that the activities are undertaken in an environment which is free from pollution. It is an important step to contribute to the region-wide policy of removing unnecessary plastic from the supply chain. For example, in recent years, there have been efforts across the globe for increased use of some crop-based packaging materials such as polylactide. These are already competitive alternatives to conventional food packaging, whereas other materials, such as starch-based materials, are also being optimized to be suitable for industrial packaging applications. These initiatives have to be replicated within the EAC region.

(d) Attract private sector investment in the manufacture of packaging materials

This intervention seeks to reveal potential packaging opportunities and showcase them to the private sector. It will involve developing a regional database of key aspects of the packaging industry, as a means to developing a common vision, priorities, and approach to developing the industry in the region. This should be followed by the harmonization of packaging and labelling requirements for the prioritized primary and secondary processed products. Other measures include increased awareness among targeted consumer and industrial segments in the region, on the benefits of improved packaging (including quantification of current and future market size as well as selected investment promotion activities targeting packaging manufacturing investors in highly promising packaging product markets in the region. It is also important to incorporate incentive packages (e.g. taxes etc.) for investment as appropriate.

The success of this initiative would require working with industry stakeholders and selected Government agencies to quickly aggregate data about the industry, working with agencies in the EAC Partner States mandated with standards harmonization (mainly the standards and certification agencies), working with investment promotion agencies, and the private's sector to promote awareness about packaging benefits and investment opportunities.

(e) Identify measures to reduce the proportion of packaging costs to the total costs of the product

This objective can be achieved through several measures, including improving the targeting of consumer and/or user segments to safeguard margins; removing any inefficiency along with the packaging products and supply chains, which can be done through improved structuring of these chains as well as improved packaging product innovations. Other measures include improving knowledge on the technological base for the packaging industry in the EAC, as well as encouraging investment in and collaboration among the support services and institutions for the packaging industry, manufacturers of converters and end of line accessories, regulators, research institutions working on packaging, and financial institutions.

The above interventions should involve working with the private sector, in order to stimulate co-financing in building the technology and knowledge base of the industry actors, whilst providing capacity-building support financed through grants and public/Government investments. Areas targeted would include improved packaging and adherence to market requirements, and investment promotion activities.

¹³² UNIDO (2011). Agribusiness for Africa's prosperity. Kandeh K. Yumkella, Patrick M. Kormawa, Torben M. Roepstorff and Anthony M. Hawkins (Eds). UNIDO, Austria, 347pp

8.2.4 Promote market access and trade facilitation

This strategic objective seeks to address the “demand” side of the various F&V products produced in the EAC. In particular, it focuses on expanding the market share of these products at local, regional, and international markets. Amongst other things, the intervention will promote business-to-business relationships between producers and consumers. The objective of this program activity is to link farmers and processors dealing with F&V in the EAC region, with reliable and premium markets. It seeks to ensure that products reach the markets in a timely and consistent manner. A major assumption is that the linkages will ultimately increase the scope for producers and other value chain actors involved in the process to be adequately compensated (i.e. increased return on investment).

An overriding strategy for addressing market access challenges in the F&V sector necessitates coordinated efforts in expanding market share for these products in these markets. As a region, there should be a guiding framework to aid Public and Private efforts and initiatives aimed at addressing “big picture” market access sustainably.

The expansion of EAC market share in the export market, will happen through an integrated approach (i.e. addressing a number of interrelated functions and processes in the value chain). Which is to say, it requires an “holistic” approach. The approach would be based on the fact that expansion of market share requires several parameters to be fixed. These may include, but is not limited to, establishing reliable links to the market; adequate and consistent supply of product volume; supply of products processed and stored properly; timely arrival of the product to the marketplace (speed to market); the smooth flow of information from production to consumption points; appropriate processing facilities and technologies; quality packaging materials; efficient and cost-effective transportation system; and adequate knowledge on market standards and quality requirements.

Against this background, the following interrelated program activities are proposed.

8.2.4.1 Promote market linkages

Market linkages refer to establishing business-to-business relationships between producers and consumers. The objective of this program activity is to link farmers and off-takers dealing with various F&V products in the EAC with reliable and premium markets. It seeks to ensure that products reach the markets in a timely and consistent manner. A major assumption is that the linkages will ultimately increase the scope for producers and other value chain actors involved in the process to be adequately compensated (i.e. increased return on investment).

The key areas of focus for this program activity are presented below.

(a) Link smallholder farmers to large commercial entities

This initiative will address the current challenge of inadequate linkages between the small-scale production sector and those of large commercial activities. It is also expected to address the problem of “informality”, characterized by the existence of relatively small formal marketing channels in parallel to a large informal one. The initiative will allow the majority of small-scale farmers to connect to the regional and international markets and, therefore, increase their chances to conduct export business themselves. It is an important step towards developing formal markets.

It is proposed that the EAC Partner States adopt a marketing model commonly referred to as the '**Business Marketing Model**'. In recent years, the model has proved to link a critical mass of small-scale horticulture producers to formal markets.¹³³ The model involves the formation of producer groups for production and marketing and then links them to markets through the existing private companies. In addition to accessing markets, the small-scale farmers will also access farm inputs, storage facilities, and extension services. The success story from HomeVeg in Tanzania is provided below for illustrative purposes.

¹³³ Mostly in Kenya and Tanzania (Arusha and Kilimanjaro regions)

Box 1: The HomeVeg Business care in Tanzania

In Tanzania, the model has been pioneered by a few private organizations such as York Limited and HomeVeg based in Arusha. The companies have introduced the Marketing or Business Model which performs relatively well in the two regions. So far, HomeVeg alone has been promoting and formed a total of 8 farmers' groups in Arusha and Kilimanjaro regions in the past 3 years. The structure and operations of this marketing model is different from other marketing models. The key players in the Home Veg Business Model include private organization like HomeVeg, small scale producers, transporters, exporters (like HomeVeg in this case), airport authorities, and clients (in the export market).

The marketing model operates through '**contract farming**' where private organizations like HomeVeg enter into contract with farmer's association or groups created through HomeVeg initiatives. Through contract farming HomeVeg promotes and help small-scale producers to form groups where group members are initially trained thoroughly on group dynamics, farming techniques, preliminary processing, extension services and storage. This model should be encouraged in other areas with high potential for horticulture production. In addition, HomeVeg supports these groups in terms of input supplies (on credit), extension services, storage facilities including input storage rooms, cold rooms, credit, markets for their products, transportation, international market standards and food safety requirements etc. In turn all producers under contract farming sell their products to HomeVeg at a given price.

A part from creating farmer's groups, HomeVeg has also built the capacity of their groups to enable them use irrigation and subsequently grow three (3) seasons (cycles) a year and harvest after 8 to 10 weeks after planting. Each group members are required to have at least 0.2 ha of land for the project. In addition, the model has been helpful to farmers' groups in terms of helping them to conform to the Global Gap Certification requirements. In this regard, HomeVeg provides guidance to farmers on the requisite standards and requirement for their products to penetrate the world market. HomeVeg is constructing a number of storage facilities for all the farmer's groups under their custody. The plan is to also furnish the groups with cold rooms. Extension services are provided in good time whenever farmers report to Home Veg of related requirements. Ultimately, these services have led to increased farm productivity.

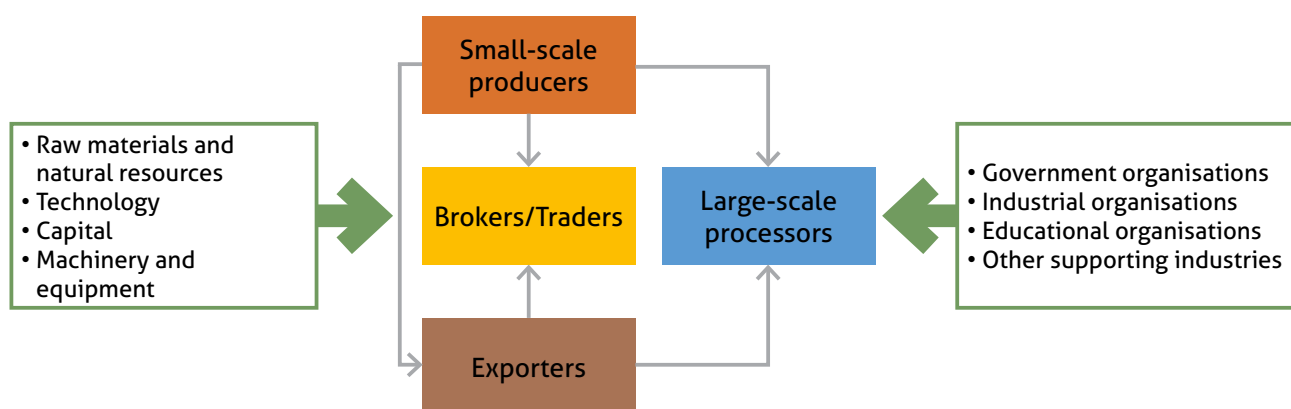
NB: It is important to note that this model has been widely acknowledged by stakeholders in the horticulture industry within the EAC region.

(b) Promote "cluster" models

The Cluster Model presented above (Section 7.3.2.2), can also be applied in the context of promoting market linkages. This intervention seeks to link a critical mass of individual F&V producers and processors, to domestic, regional, and international markets. The invention is critical, given the fact that the majority of F&V actors and firms in the EAC region fall under the category of SMEs, hence a need to build a critical mass of successful SMEs. It will address the challenge of SMEs fragmentation, where the cost of supporting and coordinating them is higher than when they operate as a group.

Clustering can also be especially important for the small-scale fruit juice processing sector in the region, where the critical mass of individual companies is too small to effectively compete in domestic and international markets. Support to industry "clusters" can become an ideal "entry" point in this value chain segment. Once target clusters have been identified through an agreed criterion, this would then be followed by the identification of appropriate interventions.

Figure 27: Illustrative value chain cluster model for promoting market linkages



Source: Authors compilation for literature review, May 2020

(c) Establish terminal wholesale markets

This initiative involves the creation of an alternative marketing structure, through the establishment of a terminal wholesale market that operates parallel to, and in addition to, the present system of a multitude of wholesale markets common in the EAC. At present, the F&V supply chain has multi-layered marketing channels and lacks market infrastructure. The intervention will provide essential infrastructural services, including product distribution; cold storage; grading, sorting, adequate quantity, and quality products; and proper integration of post-harvest technology into the marketing supply chain. The facilities will also introduce a transparent and efficient platform for the sale and purchase of products, by connecting growers through Growers' Associations, with farmers and wholesale buyers in various markets across the EAC. They will also provide incentives for improved quality and productivity, thereby improving farmers' income. Through this approach, an increased integration is expected between growers, wholesalers, and retailers into the market system.

A single gateway to the markets will save time and improve efficiency. Vertical coordination of farmers through cooperatives, contract farming, and retail chains, would facilitate better delivery of output, reduce market risk, provide better infrastructure, attract more public investment, acquire better extension services, and create awareness regarding prevailing and new technologies. The multiplying effect would help increase income, output, and employment. The terminal market will also have an auction facility through clock auction; backward linkage through farmer associations; and forward linkage in the form of cash and carry semi-wholesale and retail stores.

(d) Promote digital marketing

Market linkages can be promoted through the establishment of "digital marketing platforms". This proposal would be based on the fact that in the current digital age, developing know-like-and-trust relationships with clients is more likely than ever to happen online. A healthy website with a strong social media presence is a dynamic way of promoting market linkages. A user-friendly and technically sound website helps attract more potential clients. This business model can make a significant difference for clients in the F&V sector within the EAC. Already, many clients and prospective customers have seen the positive impact an effective Internet plan can bring to other industries, particularly those which target mass consumers, for example, food distribution systems. This can also be replicated in the F&V sector.

The digital marketing platforms will allow the proposed market linkage initiatives to promote the East African F&V sector in a cost-effective manner, to a targeted online audience. Digital marketing activities should be designed to promote visitation to the websites, where potential buyers will find inspiration and informational content for planning a business transaction. To begin with, this will require the establishment of the Regional F&V Facilitation Committee. The Committee will use several digital marketing platforms to undertake the linkage initiative. To coordinate the messaging between these platforms, the Committee will develop a content calendar that identifies important messaging milestones during the year (such as major marketing and branding events) and describes content themes that will be developed over the year. Based on this content calendar, the committee will develop content for its digital marketing platforms. In addition, the Committee can also publish content contributed by others in the region and beyond.

(e) Roll out branding and targeted marketing initiatives

This program activity seeks to build a brand vision for the EAC fruits and vegetable subsector. The brand vision should consider three distinct, but interrelated thematic areas, namely: the origin of products¹³⁴; production systems¹³⁵; and commodity characteristics.¹³⁶ Additionally, there are several market and consumer characteristics¹³⁷, which have an important bearing on the branding efforts. For each of these, potential "brand names" and/or "catchphrase(s)" should be identified and developed. These should be accompanied by appropriate selling points as well as a target niche market.

¹³⁴ Certificate of Origin for all F&V products. To ensure successful branding, all F&V products exported from EAC ports should have a certificate of origin' the objective is to ensure the end user recognizes the products and coming from EAC and nothing else! If there are unique brands from EAC, the branding efforts should feature this prominently!

¹³⁵ These may include a number of unique consumer characteristics and preferences, which in turn provide incremental sources of utility to consumption. For example: issues related to ethical production, traceability, transparency, rising demand for organically grown food products; changes in consumption patterns resulting from increasing middle class.

¹³⁶ Different clientele can have special commodity characteristics, which increases their utility for consumption. Some are mandatory quality attributes others are purely consumer preference based on their "perceived" utility for consumption. Specific attributes may range from Maximum Residue Levels (MRL), shelf life, smooth versus wrinkled avocado, small versus large orange etc.

¹³⁷ These may include a number of unique consumer characteristics and preferences, which in turn provide incremental sources of utility to consumption. For example: issues related to ethical production, traceability, transparency, rising demand for organically grown food products; changes in consumption patterns resulting from increasing middle class.

Implementation of the brand vision will contribute to promoting market linkages for the industry in general, and also create maximum benefits to the value chain actors. The Regional F&V Facilitation Committee proposed above, can work with stakeholders and industry specialists to develop and agree on appropriate brand names. Where appropriate, professional advice from “communication specialists” should be sought. The ultimate objective being, to create an EAC image and footprint in the F&V export markets in the region and beyond.

8.2.4.2 Promote regional and international trade

This program activity seeks to build the capacity of F&V actors in the EAC, in order to participate in regional and international trade. It is based on the premise that their ability to trade internationally increasingly depends on the degree to which they can enter into global value chains, which are established by transnational corporations. On the one hand, this requires working on the supply side, enabling enterprises to export fresh and processed products with high export potential in the quantities and at the level of quality required by the markets. On the other hand, it requires evidence of market conformity, enabling these same enterprises to ensure that their products conform to the relevant international standards, in particular private buyer requirements, and technical requirements.

Trade capacity-building program will focus on the supply side of the trade. More specifically, it will support producers and enterprises in their efforts to offer competitive, safe, reliable, and cost-effective products in world markets. This requires identifying products that have competitive potential and are suitable for local value addition. It will also require comprehensive analysis and assessment of key trends in value chain performance at national, regional, and global levels, and formulating strategies designed to improve their competitiveness and to overcome technical barriers to trade (TBT), and comply with sanitary and phytosanitary measures (SPS).

There are significant opportunities for cross-border trade in the F&V value chain. This is particularly the case for small-scale producers, who at the moment struggle to sell high-value highly perishable products as soon as they are harvested. It has been observed across the region, that the tendency for localization of markets for perishable products, such as fruits and vegetables, is a common phenomenon. Currently, prospects of increasing regional trade in commercially produced fruits and vegetables are only limited to large-scale commercial producers. This intervention, therefore, seeks to empower small-scale farmers to participate in the regional markets.

There is already a window of opportunity within the region that can be used as a “springboard” to promote cross-border trade in F&V’s. In particular, the recently established One-Stop Border Post (OSBP) within the EAC Partner States, is likely to improve formal cross-border EAC trade for F&V products. There are already ongoing efforts to promote free trade in general and significant efforts have been made by the EAC to guide the rules and regulations for conducting cross-border trade. What is required is to formalisation and customisation of the rules and regulations in the context of the fruits and vegetable trade.

Smallholder producers and traders will need to be empowered to participate in the trade. Specifically, for the F&V sector, there is a need for a comprehensive information pack (Simplified Guide/Tool) which can provide up-to-date and relevant information on the existing policies, procedures, requirements, rules of origin, taxes, tariffs, exemptions, and facilities available to cross-border traders, such that they can more easily trade within the region. This guide should provide information on key EAC trade rules, regulations and procedures, related to trade within the EAC (intra-EAC trade) in a simplified and user-friendly manner as well as relevant government institutions.

8.2.4.3 Strengthen market information system

This intervention seeks to ensure that information reaches a critical mass of actors within the F&V value chain for timely decision-making. It is proposed against the background that the lack of market research results and information is a major problem facing the augmentation of marketing efficiency in the East African F&V sector. Below are the actions for this program activity.

(a) Improve market intelligence and dissemination across the whole value chain

This intervention seeks to build the capacity of value chain actors¹³⁸ in undertaking value chain studies and market research. It is based on the fact that data collection and analysis are crucial to building an accessible

¹³⁸ Key target actors are Government ministry officials, producer and processor associations, industry experts and advisors.

pool of knowledge for the F&V sector. To increase its utility, the information has to be made “user friendly” and readily available by more traditional means, as well as electronically. This sharing of information will include promotional campaigns both at international and domestic levels.

(b) Strengthen knowledge management system

This program activity seeks to establish an “industry observatory” function, as a way of enhancing “Knowledge Management” among key actors within the East African F&V value chain. The objective of the initiative, to be rolled out both at the regional and Member State level, is to address the prevailing challenges of the information gap between business operators, policy-makers, academia, and the public at large.

Industry Observatories are run through a “web portal”, hosted and managed centrally by a Government Ministry/Agency or Industry Association. They receive inputs from the online-based information from other institutions including ministries and agencies, private institutions, and international organizations.

The Industry Observatory tool can have several categories and/or chapters, which define its operations and functions. Usually, the categories will depend on the need of the industry. These may include, for example, Economic watch; starting and Operating a Business in the F&V sector; Market Intelligence; Trade Agreements; Global Competitiveness and Trade Flows. The above categories can be modified to suit the context of the East African F&V sector.

8.2.4.4 Improve logistical infrastructure

Improvement in logistical infrastructure within the EAC region, not only ensures lowering of costs of doing business, but also promotes regional trade competitiveness and integration. Accelerated access to growth markets for F&Vs is a key driver of investment in the horticulture industry.

Below are the proposed actions to improve the logistical infrastructure:

(a) Strengthen post handling systems in the transport infrastructure (railways, posts, airfreight services) to cater to the needs of perishable F&Vs.

For example, cold storage facilities, cold rooms for transit goods, and “green” belts to fast-track clearance at the ports, will ensure a faster transit time (speed to market); safe products, and adequate volumes at destination points.

(b) Improve transport and communication infrastructure in the major EPZs and production corridors

The production corridors will provide a critical mass of products, thereby enabling EAC to deliver increased quantities of F&V in the export markets. Improved communication systems in these corridors will lower the cost of delivering the goods to the destination markets.

(c) Establish service-oriented collection centres/satellite collection centres and packhouses.

This intervention seeks to build a supply sub-sector that will guarantee a consistent and continuous supply of fresh F&Vs. The main services provided by the centres, will include information dissemination, cooling, grading, and sorting. Capital services, such as pick-up and delivery, will also be provided.¹³⁹ The latter would enable farmers to meet customers' quality requirements and allow appropriate planning for planting. The grading services will create and enforce strict quality standards on all produce agreed to with the buyers. Finance and admin support services will also be offered.

The centres will also provide a series of “embedded” services to value chain operators. These will come on stream after the pilot service centres have consolidated the core portfolio/primary functions. The expanded services could include marketing of produce; training for farmers on quality and management; information collection and dissemination; finance/credit lines and collateral provision; common sourcing of supplies; bulk buying of inputs; seeds and packaging, and engaging technical (national/regional/international) consultants in the field of growing and post-harvest handling. The longer-term functions may include, Increased overall volume and integration of independent farmers, empowering farmer community bargaining skills, maximizing efficiency by working together and sourcing commonly, share market and buyer demand information, encouraging first stage food processing, etc.

The proposed centres will be run on a commercial basis to ensure sustainability. Ideally, the centres should be managed by farmer associations and/or a private sector operator.

¹³⁹ Information on price, quantities needed, quality, transport availability. These can be provided through mobile phones.

8.2.4.5 Support creation of a critical mass of off-takers

The F&V sector currently has few off-takers. Not many actors in the private sector have been attracted to: engaging in the purchase of products from the production areas; transportation services, packaging, processor, or marketing activities. The sector has suffered from a lack of service providers and/ or actors across the entire value chain spectrum.

The following action is proposed:

(a) Integrated solutions to attract off-takers

This initiative involves a series of interrelated interventions in the value chain. These include mapping out and identification of the most potential crop varieties (industry priority crops), with the highest potential in the market. Off-takers need to be assured of adequate production and productivity of potential crops in any given area in order for them to engage. These can be marketed and branded to attract more players in the industry, particularly the private sector. The branding efforts should target all stages of the value chain (i.e. from production, transportation, processing, packaging, and marketing). Other interventions may include:

- Improving the certification infrastructure through selecting and appointing qualified local certification agents. Fast-tracking the certification system will eventually attract more players in the sector.
- Contract farming models can also be used as a way of attracting off-takers because of the assured volume of supply.
- Fast-tracking input registration systems to ensure more players are attracted to the industry.
- Development of central collection centres, and or satellite collection centres.
- Statistical modelling used to project yields and expected value of market.

8.2.5 Improve safety and quality infrastructure

Although the EAC is generally equipped in terms of harmonized standards and availability of a regional SPS Protocol and measures to effectively develop a strategy for processed F&V sub-sector, there are several issues which need to be addressed. Most of the outstanding challenges revolve around: farmer's knowledge of market standards and how to interpret them; enterprises' knowledge of trade policy requirements and how to interpret them into actions; adequate availability of accredited laboratories and certification bodies for F&Vs; harmonization of policies and procedures across the region¹⁴⁰, as well as developing appropriate institutional mechanisms and frameworks to oversee the implementation of various safety and quality requirements. Other challenges include poor surveillance systems and procedures, particularly at the points of entry (e.g. ports, border posts, airports, etc.), and poor certification and guarantee systems.

8.2.5.1 Facilitate harmonization of standards and institutional strengthening

Below are major recommendations for achieving this objective:

(a) Expedite the process of harmonization of East African Standards (EAS)

The EAC should develop harmonized standards for the fresh and processed fruits and vegetables which are most frequently traded, to enhance cross-border trade. The East African Business Council (EABC) should continuously sensitize the business community to use the available EAS.

(b) Conduct strategic engagements with relevant institutions

Respective Partner States should engage relevant institutions handling SPS and EAC secretariat, to establish an EAC committee on SPS measures. The responsible institutions should be sensitized towards adopting similar, or at least approximate, measures with regard to veterinary drugs and pesticide residues, toxins especially permitted aflatoxins and other contaminants. Also, the Partner States should sensitise relevant institutions to develop adequate SPS measures to enable them to control imports as well as grow exports. It is also important for the Partner States to organize regional workshops to bring together MSMEs and large firms, as well as the Quality Infrastructure Institutions for elaborate discourse on industry needs and challenges and discuss policy intervention from the Public sector.

8.2.5.2 Build local capacity for farmers, enterprises, institutions, and Partner States in trade-related policies and procedures on safety and quality

This activity program seeks to move the EAC region forward, by removing technical barriers to trade (TBT) for greater intra- and inter-regional trade and investments.

¹⁴⁰ For example, regulation of seeds sourcing and usage to enhance quality and better yield.

The following actions are proposed:

(a) Build the capacity of farmers and enterprises to comply with international standards and market requirements

There are several market standards which govern international trade in food products. A clear understanding of these standards will allow producers of F&V to participate in the international markets. In particular, exporting enterprises are required to meet buyer and/or market requirements, based on internationally accepted good practices and/or standards, where they have to: (i) manage food safety (based on guidelines and standards like GAP GHP, GMP, HACCP, ISO 22,000, and other Private Standards); (ii) Manage quality (based on standards like ISO 9001 Quality Management System); (iii) manage environmental impact (based on standards like ISO 14001); and (iv) meet social accountability requirements (SA 8000, Fairtrade), and more recently resource sustainability requirements e.g. Carbon Labelling. To overcome trade barriers, F&V enterprises must not only comply with standards, but also technical regulations¹⁴¹ and conformity assessment procedures and certification mechanisms throughout the supply chain, to protect consumers, producers, and the environment.

(b) Harmonize the technical requirements across the region, and in the export markets

This action includes: (i) further harmonization of technical regulations, (ii) establishment of more robust systems for notification of new technical regulations, (iii) enhanced standardization of Food Standards within the EAC, Africa region (through the ARSO¹⁴² harmonization structure), and internationally.

(c) Develop specific guidelines for the F&V sector

This action will enable EAC countries to take full advantage of the existing international trade policies and agreements, and also to interpret them into action within the context of the F&V sector. There are currently no policies or directives specific F&V sector at the regional level, this area needs to be addressed. Efforts to harmonize national regulations across the EAC region have the potential to increase the competitiveness of the F&V subsector.

8.2.5.3 Strengthen the surveillance system and procedures

This activity program seeks to address challenges related to poor surveillance systems at the points of entry (e.g., ports, border posts, airports, etc.).

The following actions are proposed:

(a) Build the capacity of key personnel in understanding and implementing surveillance systems

This action seeks to address the problem of limited trained personnel for surveillance purposes. It will involve specific actions such as: providing a specialized training program; improving the field transport system; the purchase of specialized surveillance equipment and tools; and putting in place phytosanitary protocols for various plants. Other specific actions include improving quarantine and disinfection facilities; hiring and training additional phytosanitary inspectors; and strengthening capacities for conducting pest risk analysis.

(b) Refurbish and upgrade chemical and microbiological laboratories

This action proposes the urgent upgrading of selected laboratories in the region. The Partner States need to identify testing facilities to be upgraded for food quality control purposes. This will enable competent authorities to designate national laboratories for specific functions.

8.2.5.4 Strengthen the certification and guarantee systems

Improvement in the certification and guarantee systems, will ensure that EAC can cope with the large and increasing number of management and food safety standards adopted in the fresh F&V industry. This is against the background that food safety is a top priority in all European food sectors. It is therefore logical to expect most buyers to request extra guarantees in the form of certification. All actors in the supply chain, such as traders, food processors, and retailers, require the implementation of food safety.

The certification initiatives and processes across the EAC face several challenges including: unstructured producer and marketing systems – the majority being SMEs and not unified; Inadequate skills for development and implementation of effective quality assurance systems; cost of certification; availability of certification bodies; lack funds for certification process; cost of compliance, due to foreign certification bodies; and limited skills and professionals in certification.

¹⁴¹ Technical regulations include the following aspects: product and process characteristics, product dimensions, product design and performance criteria, packaging, marking and labelling requirements, process and production methods, and administrative provisions for procedures like inspection, testing, certification, and approvals.

¹⁴² African Organization for Standardization

Capacity building of actors to ensure compliance with the standard certification and guarantee systems, will provide specialized training programs to SMEs for implementation of effective quality assurance systems. These include, but are not limited to, GLOBALG.A.P; BRC: and IFS, SQF, FSSC 22000: Part of this initiative will involve: developing structured producer marketing systems; unifying the SMEs (for example, through development of effective producer organizations, and development of quality assurance systems).

8.2.6 Build local skills and knowledge base

The uniqueness of the horticulture industry indicates a need for sufficient industry-specific skills at the local level. The industry is high-tech, knowledge-intensive, and focuses on high-value crops such as F&Vs. There is, therefore, a need to develop local capacity skills in these areas, in order to accelerate the absorption, utilization, and maintenance of technologies. Based on current experiences in human skills challenges within the industry, together with the unfolding opportunities in the region and beyond, the following actions are proposed.

(a) Conduct curriculum review for local institutions

The reviews will capture the fast-changing dynamics of the industry, for example, production and marketing systems to cater to the needs of the emerging middle class in the region and beyond.¹⁴³ This will provide the region with “job-ready” graduates from the existing institutions. Once the curriculum review has been undertaken, the institutions can conduct regular refresher training (on job training, particularly to the government extension services). These should ensure that personnel have continuous access to new developments in technology and disease control systems and mechanisms. Development of awareness-creation materials and programs on the application of GAP and Good Hygienic Practices and Standards along the value chain should also be part of the new curriculum. It is also important to equip the graduates with managerial and business skills, in addition to the technical skills.

(b) Enhance the capacity of the ATVET system

The capacity of the ATVET system, can be enhanced through: (i) promoting collaboration and coordination between industry and the education and research institutions, (ii) accountability and responsiveness to the needs of the industry, (iii) addressing any gaps in the National Qualification Frameworks, particularly with respect to wider certification, quality assurance, standardization, and (iii) creating flexibility in enforcing capabilities of the mandated institutions.

(c) Invest in proven models of technology transfer and skills development in the region

This intervention should target equipping the lower-level cadre (e.g. undergraduate, higher diploma) with a practical skills base. Based on the design of this model, the impact can reach the entire supply chain of companies, impact the education institution’s curricula including generation of research papers for academics,¹⁴⁴ enhance the sponsorship opportunities for graduates, establish technology transfer infrastructure between industry, academia, and research and industrial training institutions, which becomes the basis for further collaboration.

(d) Invest in selected higher-level specialized skills in partnership with centres of excellence

This area covers high-level analysts and researchers who can provide “thought leadership” to the industry. These will require a high-level academic degree (PhD and MSc) in specialized areas relevant to the F&V industry, such as Food biotechnology, industrial and process engineering, microbiology, waste management, and computer-aided design and manufacture.

(e) Develop strategic linkages with the private sector

The governments should promote entrepreneurship and innovation activities focused on horticulture, through direct linkages to the private sector. These may include, for example, industrial attachments; internship programs; youth incubation schemes; technology-based incubation centres, and apprenticeship schemes.

(f) Develop regional wide skill development policies

There should be a region-wise policy response to incorporate requirements for mandatory certification of the practitioner on key technical areas such as quality assurance and standardization. Appropriate policy instruments should be developed and linked to the National Qualification Frameworks (NQFs), as well as the Regional Qualification Frameworks (RQFs). However, it should be noted that the implementation of these frameworks requires strong TVET systems, thereby the requirement to equip the TVET systems with the requisite skills to monitor assess, and share knowledge on how these policies are working. This is currently widely recognized as a key challenge across the EAC. Efforts should also be made to create appropriate poli-

¹⁴³ The growing middle class in the urban centers have new consumption patterns which ultimately dictates the way the F&V industry should be structured.

¹⁴⁴ Currently, for academic courses related to agro-processing, about 75% of the academic institutions in the EAC are offering Agricultural Engineering and Food Science/processing related courses (Kilimo Trust, 2013)

cy incentives for these institutions, to ensure skills development initiatives are aligned with skills allocation and utilization in the industry.

8.2.7 Strengthen the coordination, institutional and policy framework

The success of the F&V Strategy will require a strong institutional framework at national level, to ensure that program activities are well entrenched within the overall regional strategy. The following program activities are proposed.

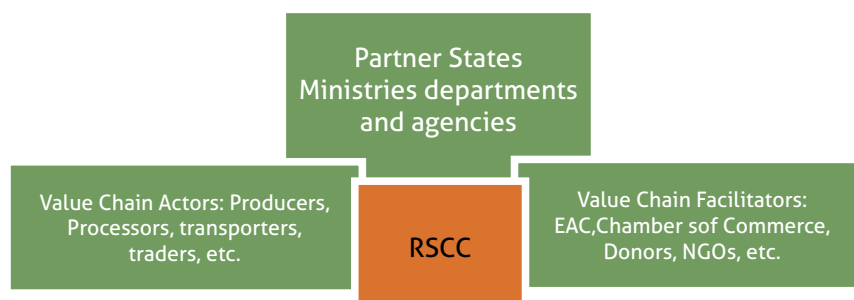
8.2.7.1 Strengthen an institutional framework for value chain development in F&V

According to international best practice, the institutional framework for value chain development should set out the lead ministries and other key actors (e.g., industry associations or other professional bodies), who will take overall responsibility for advancing the F&V development agenda, these are also referred to as “Key Actors” or “Industry Champions”. The framework should also clearly spell out the position and role of public and private sectors and laws, guiding them as well as strategies for achieving maximum impact. The following actions are proposed.

(a) Establish national and regional sub-sector coordination platform

The platform will act as a formal mechanism which brings together various value chain actors to discuss issues of mutual interest. In practical terms, the platform should take the form of a “Regional Subsector Coordination Committee” (RSSC). The guiding principle for establishing a coordination platform is that it should comprise representatives from various key value chain actors in each Partner State.¹⁴⁵ This will ensure that ownership, on the part of the value chain actors, is built-in right from the onset and that all activities are undertaken with commercial orientation. Furthermore, the platform will encourage buy-in from the respective governments, (particularly policymakers) and other value chain facilitators (including BDS providers). Suggested composition of a typical value chain coordination committee could be as depicted in the figure below.

Figure 28: Schematic composition of Regional Sub-Sector Coordination Committee (RSSC)



8.2.7.2 Strengthen policy frameworks

To accelerate the development of the F&V sector in the EAC, there is a need to align the sector policies at national level to the regional, continental, and international policies and frameworks. A number of policies have been developed at both regional and national levels, that should support the development of the F&V sub-sector in the region. For instance, at the regional level, there are five policy documents targeting agribusiness and agro-industry development. These include the EAC SPS Protocol, EAC Agricultural and Rural Development Policy, CAADP Pillar II Framework, Food and Nutrition Security Policy, EAC Food Security Action Plan, EAC Industrial Policy, and the EAC Industrialization Strategy. In addition, several policies exist at the national level, however, the main challenge is the implementation of such policies. The existing sector policies at national and regional levels need to be translated into action.

Given the above, the following actions are proposed:

(a) Facilitate and fast-track the implementation of existing policies

Mechanisms for implementing the policies, should be put in place by the EAC Secretariat and individual Partner States. An elaborate M&E system should be developed with appropriate indicators and other results tracking mechanisms. Budget allocation at the national level for monitoring policy implementation in the F&V sector is also critical.

¹⁴⁵ Including policy makers and industry specialists

(b) Provide capacity building for the implementation of the Strategy

There is a need to roll out a capacity-building program in the respective Partner States, targeted at Government Ministries and Agencies, and various institutions responsible for overseeing the implementation of F&V Strategy. The program can also be extended to other institutions responsible for sector policy and strategy formulation, implementation, monitoring, and evaluation. It is expected that the program will accelerate structural changes in respective countries and enable EAC to catch up with the unfolding dynamics in the global F&V industry. Consideration should be given to ensuring that the proposed interventions first and foremost contribute to the facilitation of the operationalization of the EAC-wide industrial development policy. The program should also contribute to the achievement of key outputs and outcomes spelt out in the major national policies and strategies.¹⁴⁶ The key national institutions need a blend of skillsets to deliver their mandate. The skillsets include a combination of 'hard' technical skills and 'softer' interpersonal skills.

8.2.7.3 Strengthen advocacy

A conducive business environment, stimulated by joint stakeholder efforts, is key to the transition towards higher levels of sector growth and increased competitiveness. The industry support structures should be positioned toward a common cause, particularly the development of favourable and supportive regulatory frameworks.

A key action for promoting a conducive business environment is described below.

(a) Incorporate advocacy component in the F&V Strategy

Efforts to modernize the F&V sector in the EAC region and respective Partner States, requires significant advocacy through Public-Private Dialogue (PPD) initiatives. This is largely because industries, individual firms, and industry clusters are often faced with a myriad of policy-related challenges, which impact their ability to become competitive. These constraints require significant investment in the policy advocacy, over and above the requisite requirements to manage businesses more effectively and increase efficiency. The successful implementation of the F&V Strategy and Action Plan would, therefore, require some degree of orientation to policy advocacy for it to have an opportunity to advance these policy challenges through recognized policy advocacy institutions.

8.2.8 Promote nutritional and medicinal indigenous F&Vs

In addition to the "commercial" or "business" approaches for developing the F&V subsector in the EAC region, there are other "social" dimensions that have to be considered to be part of the overall strategy. A critical social dimension is the "health and wellness" of the communities within the EAC. This intervention brings to the fore, critical issues related to the nutrition and health promotion aspects of fruits and vegetables that should be dealt with. Interventions presented in this Strategic Objective are also in line with one of the major objectives EAC Food and Nutrition Security Action Plan, i.e. "improving access and utilization of nutritious, diverse and safe food". This is over and above the commercial objectives which have been presented in previous interventions.

Given the above, the following program activities are proposed.

8.2.8.1 Promote nutritional indigenous F&Vs

This program activity seeks to improve dietary diversity¹⁴⁷ in East Africa. Diversifying diets with traditional vegetables is a sustainable way to supply a range of nutrients to the human body, whilst combating micronutrient malnutrition and associated health problems, particularly for poor urban and rural households. Traditional vegetables are a vitally important source of micronutrients, fibre, vitamins, and minerals, and are essential components of a balanced and healthy diet. In addition, indigenous vegetables are better adapted to the environment than standard (non-indigenous) vegetables, and can therefore provide low-cost quality nutrition to a large population segment.¹⁴⁸

¹⁴⁶ Particularly for those countries which have such policies and strategies in place

¹⁴⁷ Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods including traditional vegetables and is also a proxy for nutrient adequacy of the diet of individuals.

¹⁴⁸ Chweya, J. A. and Eyzaguirre, P.B. 1999. The biodiversity of traditional leafy vegetables. International Plant Genetics Resources Institute. Rome, Italy

Vegetables, particularly traditional vegetables, are rich in micronutrients and other health-promoting phytochemicals. These nutrient-dense vegetables complement staple foods and improve the nutritional quality of diets.¹⁴⁹ Integrating a diversity of micronutrient-rich foods such as vegetables, fruit, and some animal products into diets, is one of the easiest and most sustainable ways to stop micronutrient deficiency.¹⁵⁰ These vegetables have high levels of minerals, especially calcium, iron and phosphorus, vitamins A and C, and proteins,¹⁵¹ which are important to vulnerable groups such as pregnant and nursing mothers. Spider plant (*Chlorophytum comosum*), Roselle (*Hibiscus sabdariffa*), and Hair lettuce (*Lactuca sativa*) are excellent sources of iron¹⁵², whilst African nightshade (*Solanum nigrum*), jute mallow (*Corchorus olitorius*), and moringa (*Moringa oleifera*) are substantive sources of provitamin A.¹⁵³

In East Africa, limited dietary diversity is a major challenge and cause of malnutrition, particularly in rural farming communities. This situation persists because most households rely on carbohydrate-rich staples; only small quantities of animal products, fruit, and vegetables are consumed and, therefore, diets lack the spectrum of nutrients needed for health. Although East Africa has made good progress with many health indicators over the past decade, the nutritional status of the population remains low.¹⁵⁴ Malnutrition is high among most rural and urban households, particularly in the low-income group, which consumes a diet of mainly carbohydrate-rich staples with low mineral and vitamin levels.

Below are the key actions for this program activity:

(a) Promote production and consumption of indigenous fruits and vegetables

This intervention is proposed to enhance household nutrition among urban and rural households, through increased consumption of nutrient-dense traditional African fruits and vegetables.¹⁵⁵ Currently, the existing demand for indigenous F&Vs is very low, particularly for urban dwellers, this is largely a problem of low consumer awareness. This problem can also be looked at from another angle, which is already an “intrinsic” advantage. The majority of poor rural dwellers, which constitute the majority of the population in almost all EAC countries, rely on the indigenous F&Vs for nutritional sustenance because most of them live below the poverty line and cannot afford animal-based proteins.

This challenge can be addressed through demand creation activities, such as promotional campaigns, and increase supply of indigenous F&Vs to urban markets. The campaigns are expected to increase the consumption of indigenous F&Vs by rural and urban consumers. There are several locally grown vegetable products, which can enhance household nutrition, for example, Native African Leafy Vegetables (ALVs) such as *Amaranthus* sp. (*Amaranthus*) and *Vigna unguiculata* (Cowpea), have been identified as promising food-stuffs for addressing micronutrient deficiency, food security, and up-scaling. Compared to other vegetables, they are more resistant to diseases, are drought-tolerant, yield well, and are well accepted in Eastern Africa in terms of taste.¹⁵⁶ Importantly, ALVs are highly nutritive, containing the recommended daily allowance of vitamin A, B2 (riboflavin), and C, iron, and calcium, in only 100 g of fresh leaves.¹⁵⁷

There is already evidence of the success of promotional activities by selected research institutes and non-governmental organizations in East Africa.¹⁵⁸ For example, these efforts have increased demand for African nightshade in urban supermarkets, groceries, retail markets, and hotels. Such efforts should be scaled up and intensified.

¹⁴⁹ Ojiewo, C. O., Abdou, T., Hughes, J., and Keatinge, J.D.H. 2013a. “Diversifying Diets: Using African Indigenous Vegetables to Improve Nutrition and Health.” In *Diversifying Food and Diets: Using Agricultural Biodiversity to Improve Nutrition and Health*, eds. J. Fanzo, D. Hunter, T. Borelli, and F. Mattei Earthscan. Abingdon, UK: Routledge, 291–302.

¹⁵⁰ Ali, M. and Tsou, S.C.S. 1997. Combating Micronutrient Deficiencies through Vegetables – A Neglected Food Frontier in Asia, *Food Policy*, 22: 17–38

¹⁵¹ Nesamvuni, C., Steyn, N.P., and Potgieter, M.J. 2001. Nutritional value of wild leafy plants consumed by the Vhavenda, *South African Journal of Science*, 97:52–54.

¹⁵² Weinberger and Msuya, 2004

¹⁵³ Muchiri, S.V. 2004 Characterization and Purification of African Nightshade Accessions for Sustainable Seed Purification in Kenya, In the Proceedings of the Third Horticulture Workshop on Sustainable Horticultural Production in the Tropics, 26th –29th November 2003. Maseno University, MSU, Maseno, Kenya.

¹⁵⁴ UNICEF, 2016

¹⁵⁵ Indigenous F&V are recognized by many communities that are at risk of under nutrition, but lack of access, availability, or cost considerations have prevented them from being consumed on a regular basis. While regionally consumed, they are often not considered as cash crops, which has resulted in a lack of development for production and limited household consumption.

¹⁵⁶ Woome and M. Imbui, *Traditional Green Vegetables in Kenya*, 2003

¹⁵⁷ I. F. Smith and P. Eyzaguirre, African leafy vegetables: their role in the World Health Organization’s global fruit and vegetable initiative, *Afr. J. Food, Agric., Nutr. Dev.*, 2007

¹⁵⁸ Ojiewo, C. O., Abdou, T., Hughes, J., and Keatinge, J.D.H. 2013a. “Diversifying Diets: Using African Indigenous Vegetables to Improve Nutrition and Health.” In *Diversifying Food and Diets: Using Agricultural Biodiversity to Improve Nutrition and Health*, eds. J. Fanzo, D. Hunter, T. Borelli, and F. Mattei Earthscan. Abingdon, UK: Routledge, 291– 302

(b) Promote preservation and processing technologies

This intervention seeks to address the challenges of nutrient loss, due to processing and preservation technologies in East Africa. Fruits and vegetables, being living tissue, are highly perishable, vulnerable to changes in colour, flavour, and texture after harvest, as a result of heat-induced damage, micro-organisms attack, and/or enzymatic activities on/in the living tissue.

The problem of rapid deterioration of the indigenous fruits and vegetable varieties in East Africa is a major concern. Significant wastage occurs during the production season and limited supply during the off-season. This is accompanied by high prices, because most locally available vegetables are seasonal and not available all year round. It is known that between 10 and 100% of the total vegetable produced in the region is lost on and off-farm.¹⁵⁹

The local methods of processing and storage often result in nutrient erosion, thereby resulting in a shortage of potential nutritional quality of the vegetables. It is also known that a great degree of contamination takes place in the handling and storage of vegetable products at the local level in rural Africa, which also affects final product quality. Another major cause of deterioration is the contamination of the leaves in the process of washing after harvest. The speed of biophysical-deterioration varies among different vegetables, but compared to other crops, such as cereals and tubers, it is well known that vegetables deteriorate more quickly.¹⁶⁰

The fundamental problem is that most subsistence farming communities do not have access to appropriate technologies, and even with simple refrigeration, most farmers lack the financial capacity to procure the facility. Therefore, there is the need to design appropriate, cost-effective, and rurally adaptable technologies for the preservation and storage of indigenous vegetables, to ensure long-term availability during the off-season.

The role of precooling technologies in vegetable preservation: The above challenge can be addressed through promotion and use of pre-cooling technologies: The most appropriate technology in this context is solar energy, which can be used for vegetable processing at local and household levels. Solar energy is appropriate for both pre-cooling and other subsequent storage processes. Precooling is required immediately after harvesting vegetables to counter the negative effect of field heat, which also aggravates wilting, and loss of leaf quality. After pre-cooling, the fresh vegetable can be transferred to simple solar-powered, mini-cold storage facilities. Leftover unsold vegetable produce can be kept in the cold storage facility for future markets or processing.¹⁶¹

Refrigeration is also possible if the farmers have access to the public supply of electricity instead of the solar-powered mini-cooling facility. However, solar technology has the following advantages:

- Low capital investment with high throughput,
- Low operational and maintenance cost, especially low-cost technology requiring low energy consumption for example solar drying and refrigeration,
- Easy to operate technology with little knowledge to install and operate, and
- Adaptable to use in rural settings, villages, and jungles.

8.2.8.2 Promote medicinal indigenous F&Vs

Research has shown that indigenous fruits and vegetables found in many parts of East Africa and Sub-Saharan Africa, in general, have significant medicinal and curative potential. Already, there is empirical evidence to show that Leafy Green Vegetables (LGV) and fruits are important sources of polyphenols, which possess both anti-inflammatory and antioxidant properties. Moreover, wild-harvested plants, including LGV species indigenous to the region, are often richer than exotic cultivars in terms of both polyphenol and nutrient content.¹⁶²

The use of plants, for both food and medicine, overlap in many cultures in East Africa, suggesting that medicinal plants already contribute to the diet of children. Research conducted in Kenya, showed that LGV has the potential to cure young children at high risk of developing kwashiorkor, a developmentally debilitating

¹⁵⁹ Habwe F. O., Walingo, K.M. & Onyango, M.O.A. 2008. Food Processing and Preparation Technologies for Sustainable Utilization of African Indigenous Vegetables for Nutrition Security and Wealth Creation in Kenya. Chapter 13 In. Using Food Science and Technology to Improve Nutrition and Promote National Development, Robertson, G.L. & Lupien, J.R. (eds.)

¹⁶⁰ University of Manitoba, Food Value of Underutilized African Indigenous Vegetables: Preservation and Processing options to optimize nutrients supply

¹⁶¹ Elsewhere (e.g. Nigeria). these facilities can simply be constructed using blocks or particle boards.

¹⁶² Evidence Based Complementary and Alternative Medicine, Volume 2015 ID 807158

malnutrition condition, associated with oedema, oxidative stress, chronic inflammation, and fatty liver. Wild plants, whether used as food or medicine, not only provide nutritional benefits but also often contain antioxidant and anti-inflammatory phytochemicals that, when incorporated into the diet, may help prevent or manage kwashiorkor. After interviewing mothers with at least one child under the age of five years, the research identified seven food plants and six medicinal plants commonly consumed by children, within vitro analyses subsequently revealing that the majority of extracts exhibited significant antioxidant and anti-inflammatory potential.¹⁶³

The following program activities are proposed.

(a) Document and showcase the medicinal F&V segment

The most ideal starting point for the promotion of medicinal F&Vs, is information collection and documentation. This is particularly important given the nascent stage of the industry.

Establish an “EAC Joint Initiative for Medicinal Fruit and Vegetables for Health.” This initiative will be responsible for coordinating all the activities related to the production, consumption, and marketing of medicinal fruits and vegetables in the EAC.

At the initial stage of the process, the team of experts will conduct evidence-based research on the medicinal attributes of selected indigenous fruits and vegetables. As part of this effort, the team will document important species, which could be used to address specific health challenges across the region. The main assumption at this stage is the “some little-known local East African fruits and vegetables plants may have a genetic makeup so outstanding that they could help solve some of the most pressing medicinal and curative needs problems”. The team will validate this hypothesis in detail and find practical recommendations.

The success of this initiative will involve working with industry stakeholders and selected Government agencies, to quickly aggregate data about the industry, working with agencies in the EAC Partner States mandated with standards harmonization (mainly the standards and certification agencies), working with investment promotion agencies, and the private's sector to promote awareness about the importance of medicinal fruits and vegetables.

Other tasks to be conducted by the team are as follows:

- Identify the overall vision, priorities, and approach to developing the industry in the region.
- Document production and consumption trends of medicinal fruit and vegetables and their current position in the EAC market and beyond.
- Map the existing policies and current programs and activities for the promotion of medicinal fruit and vegetables in the EAC.
- Propose measures to strengthen collaboration amongst sectors and actors promoting medicinal fruit and vegetable production and consumption in the EAC.
- Follow up on relevant national-level actions set within the region — identifying current challenges and needs.
- Identify and recommend appropriate technologies for manufacturing the products at the commercial level.
- Recommend strategies for collecting, characterizing, and conserving the genetic diversity of traditional East African fruits and vegetables.¹⁶⁴ This will include the establishment of effective germplasm information and seed systems for the indigenous fruits and vegetables. Appropriate formal and informal approaches in their conservation and improvement should also be considered.
- Move forward the agenda towards realization — and assist those that have yet to develop action plans, drawing on elements of the Kobe framework¹⁶⁵ for promoting medicinal fruit and vegetables at the national level.
- Highlight critical food safety issues associated with the production and consumption of medicinal fresh fruits and vegetables.
- Promote production and consumption of medicinal F&V

¹⁶³ *ibid*

¹⁶⁴ This activity can be conducted in collaboration with World Vegetable Center in Arusha, Tanzania

¹⁶⁵ This framework gives guiding principles for a fruit and vegetable program through a holistic approach. It was developed during the FAO/WHO workshop held in Kobe, Japan in September 2004 — the first joint workshop between health, nutrition and horticulture specialists

This intervention is expected to promote the consumption of fruits and vegetables proven to have medicinal properties among the East African communities. There is currently no commercial production of medicinal F&V, and the awareness and consumption are still very low. The high prevalence of Non-Communicable Diseases (NCDs) is often attributed to a low intake of fruits and vegetables.¹⁶⁶ In most parts of the region, fruit and vegetable intake is well below the recommended level of five servings per person per day, or 400g per day.¹⁶⁷ For this reason, national institutions in the EAC should establish strategies for NCD prevention and implement programs to advocate healthy diets and lifestyles through the increased consumption of fruits and vegetables. Efforts should be strengthened and greater integration of activities among horticulture, nutrition, health, and education stakeholders is considered essential. The success of this initiative requires the concerted effort of relevant institutions in the region, including National Ministries of Health, National Medicine Regulatory Authorities, the National Procurement Agencies, National Academic and Research Institutions, Private Sector, Non-State Actors (NSAs), and International Development Partners. There should also be strategic efforts to encourage the commercial production of medicinal F&V.

(b) Attract investment in the manufacture of medicinal products

Essentially, this intervention seeks to unveil business opportunities within the medicinal fruits and vegetable sector. The intervention should adopt a staged approach, whereby the first level will focus on identifying a market niche for such products. The ultimate objective is to scale up and commercialize the medicinal F&V sector in the EAC. The second stage is to identify critical areas which are attractive to the private sector, particularly the pharmaceutical industry. Appropriate incentive schemes should be embedded in the program to attract meaningful investment.

Development partners should be encouraged to join and support this agenda, and to foster information sharing. In particular, a networking mechanism should be established to enhance the interaction across horticulture, health, and education sectors within Partner States by making information available on websites and e-newsletters. This will provide a good baseline to characterize the production, supply, and consumption of medicinal fruit and vegetables and will allow identifying needs and areas for future development.

(c) Undertake consumer promotion campaigns to increase consumption and production of selected F&Vs

This action seeks to promote the increased use of selected F&Vs for specific nutritional and quality aspects in the market. The objective is to ensure that communities are aware of and are using available products to address specific aspects of nutrition and health.¹⁶⁸

¹⁶⁶ FAO, 2016

¹⁶⁷ *ibid*

¹⁶⁸ For example, some products such as guava and pumpkins are known to treat prostate cancer; moronga seed are used to treat cancer and diabetes while lemons are being used to address challenges related to Covid 19

Chapter 9

Action Plan and Implementation Matrix

A detailed description of key actions, together with timelines for implementation and the proposed indicators to track the impact of each Strategic Intervention, are presented in Annex 1. For each action, an indicative budget together with responsible actors is also indicated.





Chapter 10

The Implementation budget

The successful implementation of the EAC Regional Fruit and Vegetables Value Chain Strategy and Action Plan (EAC-R&VSAP), requires substantial financial resources, estimated at USD 18.29 million for the first period (2021–2024), as detailed in the implementation matrix. It is expected that at the start of each phase, a detailed activity-based budget will be developed as part of the evaluation of the implementation progress of the plan. Based on these estimates, the total budgetary requirement for the implementation of the 2021–2031 plan amounts to 62 million.

10.1 Quick wins

To jumpstart the strategy, it is important for the EAC to implement a selective set of “quick-win” activities, which are estimated to cost around USD11,140,000. These are outlined in table 18.

Table 18: Quick win activities

Strategic objective	Activities/Actions	Estimated Cost (USD)
Increase production capacity for fresh and processed F&Vs	Facilitate adoption of pre and post-harvest “best practices”	1,500,000
	Promote strategic priority products	150,000
	Facilitate the establishment of certified seed nurseries	1,200,000
	Streamline input registration and distribution process across the region	600,000
	Establish regional standards for horticulture inputs	450,000
	Revitalize (establish) consumer protecting bodies	450,000
	Promote the sale and distribution of chilled products	600,000
	Strengthen the institutional and legal framework on food quality and safety	300,000
	Establish Horticulture Industry Code of Conduct	450,000
	Build the capacity of producers to enable them to attain the required quality standards	300,000
	Incorporate targeted measures to improve the resilience of the sector	870,000

Strategic objective	Activities/Actions	Estimated Cost (USD)
Develop and improve packaging services	Create awareness on the existence of quality packaging materials in the region	100,000
Strengthen R&D, innovation, and processing technologies	Promote product diversification	300,000
	Conduct sensory studies for product acceptability	150,000
	Identify specific F&V products for the pilot processing scheme	50,000
Promote market and trade facilitation	Link smallholder farmers to large commercial entities	750,000
	Strengthen knowledge management system	300,000
Improve safety and quality infrastructure	Expedite the process of harmonization of East African Standards (EAS)	600,000
	Conduct strategic engagements with relevant institutions	300,000
	Improve farmers' knowledge of market standards	450,000
Build local skills and knowledge base	Conduct curriculum review for local institutions	300,000
	Develop regional wide skill development policies	300,000
Strengthen the coordination, institutional and policy framework	Establish national and regional sub-sector coordination platform	300,000
	Facilitate and fast-track the implementation of existing policies	270,000
Promote nutritional and medicinal indigenous fruits and vegetables	Create market pull for increased consumption and production of medicinal fruits and vegetables	100,000
Total cost		11,140,000

NB: Given the fact this is a continuous process, Partner States should ensure sufficient budget allocation at all times.

The budget lines indicated above are estimates only. The primary objectives of these funds are to provide an industry stimulus package, to strengthen the competitiveness of the F&V sector through deliberate strategic actions as detailed in the implementation matrix.

10.2 Resource Mobilization

Adequate financial, human, and technical resources, are crucial to the successful implementation of the Strategy. The Strategy implementation is largely dependent on several sources; mostly Partner State contributions; receipts from regional and international partners; grants, donations, funds for projects and programs; inputs and programs run by the private sector; private foundations, technical assistance; income earned from Community activities; and other sources, as may be determined by the Council.

It is envisaged that these funding sources, however, may be constrained by the intermittent and ad hoc nature of inflows, particularly with respect to development partner contributions, which are mostly influenced by many factors influencing their economies, also, potential accumulation of Partner States contribution arrears, due to financial constraints in each Partner State. Lack of coordinated efforts in harmonizing priorities between the regional and national levels, and lack of guiding operating procedures/framework for Technical Assistance; as well as lack of a guiding framework for coordination of sector-specific funding, may potentially influence efforts for optimal resource mobilization for the Strategy.

Given the above, a resource mobilization plan will be prepared by EAC Secretariat in collaboration with the Partner States.



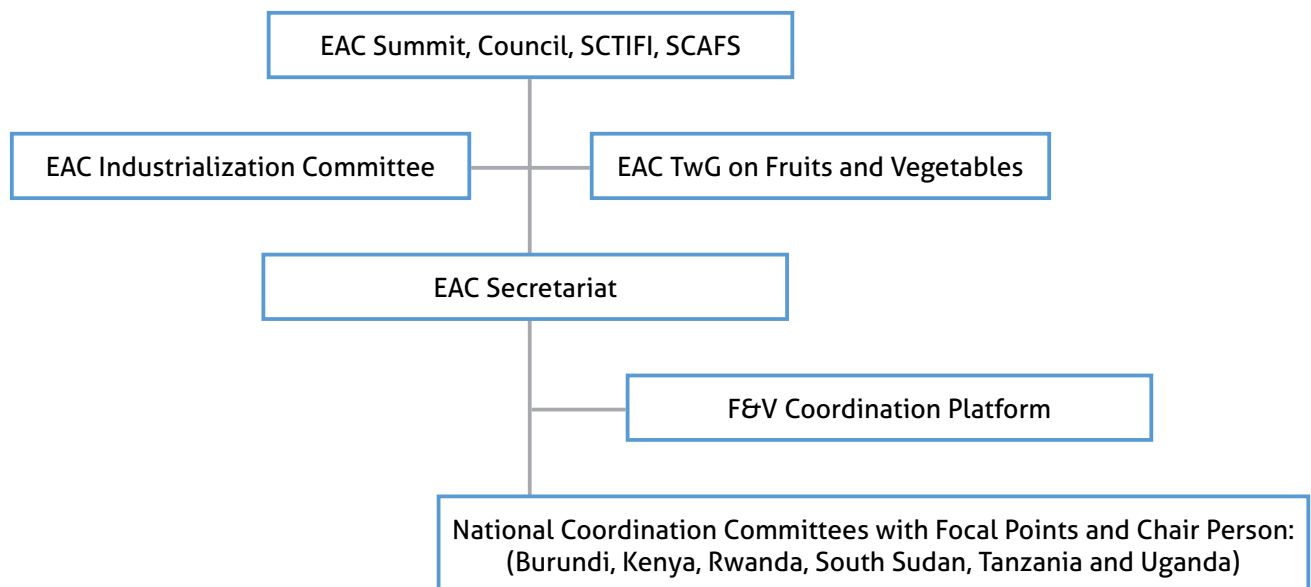
Chapter 11

Operationalization of the Strategy and Action Plan

11.1 Steering and coordination arrangements

The EAC-Fruits and Vegetable Strategy and Action Plan is a regional undertaking that is largely implemented at national level via a multi-sectorial approach. The steering structure takes into consideration the decision-making process of the EAC organisations and the multiple actors (regional and national), comprising the public and private sectors. The Industrial Development Department and the Ministry of Industry are the focal points at the Secretariat and the Partner States, respectively. Figure 29 below illustrates the steering structure in detail.

Figure 29: Simplified graph of the EAC-Fruits and Vegetables sub-sector steering structure

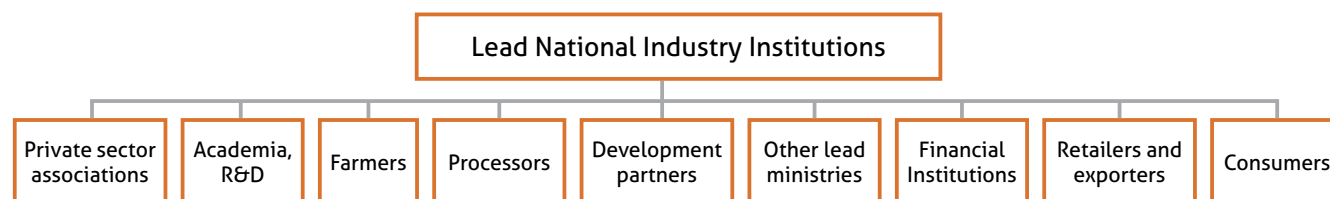


11.1.1 National-level implementation and coordination

A Lead National Industry Institution will champion the implementation of the Strategy for each Partner State. Focal points should be appointed substantively to these positions. The lead institutions will work closely with all relevant MDAs, including the Ministries of East Africa Community Affairs, Trade and Industry, Agriculture, and Finance. In particular, the institutions will guide relevant MDAs, mainstream the EAC F&V Strategy into their national plans and budgeting processing, and also ensure that National F&V policies and strategies are aligned to regional initiatives.

The Lead National Industry Institutions will also coordinate the activities of all other players and actors in the industry. In addition, the association will be charged with facilitating the establishment of the National F&V Sector Platform, comprising all the players as presented below. Through the platform, the Agency will launch implementation of the Strategy, as well as providing the necessary support to the private sector representatives to play a lead role in implementation and monitoring of the EAC-RF&VSAP.

Figure 30: National F&V sector coordination platform



11.1.2 Regional level implementation and coordination

The EAC Secretariat will oversee the coordination of the implementation of the Strategy. The Secretariat will dedicate staff to coordinate the activities related to the F&V Strategy and Action Plan. He/she will also support the national focal points to develop respective annual operational plans. A regional implementation and coordination platform for F&V, will be established, this Platform will provide a voice for the industry and assist in coordinating and facilitating engagement with EAC policy-making organisations. Reporting on the Strategy implementation, will follow the structures of the EAC regional policy organisation, including EAC Sectoral Committee on Industrialization, EAC Sectoral Council on Trade, Industry, Finance and Investment and the Council of Ministers, and the Sectoral Committee on Agriculture and Food Security (SCAFS).

11.2 Pre-requisites for Implementation of the Strategy and Action Plan

Several pre-requisites will have to be in place to ensure the successful implementation of the Strategy. The major ones include political will, commitment and support at all levels; demonstrable ownership of the Strategy by all categories of stakeholders; effective use and management of credible data/information for evidence-based decision making; sustainable use of the natural resource base¹⁶⁹ and, enhanced private sector participation. There is also a need for mindset change, including civic competence and responsibility; and a more widespread sense of "eastafrianness" amongst all categories of stakeholders across the EAC Partner States. The pre-requisites also include: demonstrable preparedness for implementation and effective monitoring and evaluation to support implementation; clarity and internal harmony of roles and responsibilities of actors/stakeholders; effective partnerships and collaboration with non-state actors; human resource capacity and conducive work environment at all levels; as well as effective and efficient resource mobilization and utilization

11.3 Monitoring, Evaluation, and Learning (MEL)

Monitoring and Evaluation (M&E) has three elements:

- **Monitoring and reporting progress against targets:** Monitoring will be done periodically after every three (3) years, and will involve several types of activities – setting up data collection and reporting processes, periodic analyses, and assessment of outcomes of the programs outlined in the Strategy against targets (including whether program milestones have been achieved). Evidence-based decision-making will be a critical component of monitoring, complemented by the development of "lessons learned" in implementing the different components of the Strategy.
- **Evaluation of achievements and identification of areas for improvement:** Evaluation will involve the collection of data, analysis, and assessment of data from implementing program activities to assess progress and whether or not specific results have been achieved. Evaluation of activities will include conducting baseline surveys, mid-point, and end-line surveys. These will be performed by an external consultant (an individual or a firm).
- **Learning** will comprise regular monitoring will allow incorporating lessons learned during implementation and any "course correcting".

¹⁶⁹ The Strategy will not operate in isolation. Various initiatives will be implemented in conjunction with other units, departments and/or bureaus within the EAC. This will ensure for example, proper environmental managements practices, are used. environmental

Annex 1: Implementation matrix

Strategic Object 1: Increase production capacity for fresh and processed F&Vs

Outcome 1: A competitive and efficient regional production system for F&Vs

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Facilitate the establishment of certified seed nurseries	Technical assistance	Approved F&V seed nurseries in the region	Number of approved seed nursery in each Partner State	Regional F&V road map monitoring report	✓			EAC secretariat, Private sector (e.g. seed distributors), Breeding and Research Institutions, National Ministries, Industry Associations	1,200,000
Streamline input registration and distribution process across the region	Technical assistance	Streamlined input registration and distribution process across the region	A harmonized system for input registration and distribution across the region in place	Regional F&V road map monitoring report	✓			EAC secretariat, Private sector (e.g. seed distributors), Regulatory Agencies, National Ministries, Industry Associations	600,000
Establish regional standards for horticulture inputs	Technical assistance	A regional standard for horticulture inputs	A consolidated regional standard for horticulture inputs in place and operational	Regional F&V road map monitoring report	✓			EAC Secretariat, Bureau of Standards, Private Sector (e.g. input distributors), National Ministries, Industry Associations	450,000
Promote strategic priority products	Technical assistance	A regional strategic priority product	A list of regional strategic priority products	Regional F&V road map monitoring report	✓			EAC Secretariat, Private Sector, National Ministries, Industry Associations	150,000
Facilitate adoption of pre and post-harvest best practices	Technical assistance	Pre and post-harvest best practices applied across the region	A system for ensuring compliance to best practices established and operational	Regional F&V road map monitoring report		✓		EAC Secretariat, National Ministries, Industry Associations, Private Sector (e.g. extension service providers, input distributors, packhouse operators, logistic service providers, etc.) Regulatory bodies.	1,500,000
Build the capacity for the public and private sector extension system	Training programs	Improved capacity of public and private sector extension agents	Number of capacity building programs for public and private sector extension agents	Regional F&V road map monitoring report		✓		EAC Secretariat, National Ministries, Industry Associations,	1,200,000
Revitalize (establish) consumer protecting bodies	Technical assistance	Improved product quality and safety standards for the local market	Consumer protection bodies established in each Partner State	Regional F&V road map monitoring report	✓			EAC Secretariat, Regulatory bodies, Industry Associations,	450,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Promote the sale and distribution of chilled products	Training programs/promotion campaign's	Increased awareness and consumption of chilled products	Number of training programs/campaigns to increase awareness and consumption of chilled products	Regional F&V road map monitoring report	✓			EAC Secretariat, private sector, Industry Associations	600,000
Strengthen the institutional and legal framework on food quality and safety	Technical assistance	Improved product quality and safety standards for the local market	Amended institutional and legal framework on food quality at the national level	Amended national reports on food quality	✓			EAC Secretariat, Regulatory bodies, Industry Associations,	450,000
Establish Horticulture Industry Code of Conduct	Technical assistance	Elaborate system describing the qualities of products be supplied to the local markets	Code of conduct for horticulture products established and operational at national level	Amended national laws and procedure reports	✓			EAC Secretariat, Regulatory bodies, Industry Associations,	300,000
Develop strategic networks to improve product quality from smallholder farmers	Technical assistance	A system for improving product quality from smallholder farmers	Number of smallholders able to supply quality products to international markets	Regional F&V road map monitoring report		✓		EAC Secretariat, Private sector (e.g. large scale farms) Industry Associations.	900,000
Promote public and private investments in large-scale operations to attain quality and standards	Consultative meetings / targeted promotion campaigns	Increased investment of public and private companies in the F&V sector	Number of public and private investments in the F&V sector	Regional F&V road map monitoring report		✓		EAC Secretariat, Private and public sector, Industry Associations.	360,000
Build the capacity of producers to enable them to attain the required quality standards	Capacity building programs/trainings	Increased ability of producers to attain required quality standards	Number of capacity building programs to producers on quality standards	Capacity building reports	✓			EAC Secretariat, Service providers, Regulatory Agencies, Industry Associations.	600,000
Facilitate the establishment of active consumer organizations to advocate the improvement of food safety.	- Technical assistance - Training	A system for advocating improvements in food safety	Active consumer organization for advocating improvement in food safety established and operational	Regional F&V road map monitoring report		✓		EAC Secretariat, Industry Associations.	600,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Use technology and innovation to improve the quality of products put on the market	• Technical assistance • Exchange programs • Training	Increased use of technology and innovation to improve quality of products put on the market	Increase in the volume of products delivered to the market due to improved technology and innovation	Regional F&V road map monitoring report			✓	EAC Secretariat, International partners, Technology development institutions in the Partner States, Industry associations	1,200,000
Use technology and innovation to increase the commercialization rate of processed F&V products	• Technical assistance • Exchange programs • Training	Improved in-house capacity to support end-to-end product development and commercialization, through strong partnerships with other institutions and service providers to address both the technical and commercial needs of the industry.	Number of end to end partnerships established	Regional F&V road map monitoring report			✓	EAC Secretariat, International partners, Technology development institutions in the Partner States, Industry associations	1,200,000
Convert appropriate innovations into business opportunities	• Technical assistance • Exchange programs • Training	Enhanced ability to use industry clusters as vehicles to transform innovations into business opportunities	Number of target products in the clusters converted into business opportunities	Regional F&V road map monitoring report		✓		EAC Secretariat, International partners, Technology development institutions in the Partner States, Industry associations	300,000
Enhance technology transfer	• Technical assistance • Exchange programs • Training	Increase the ability of users to convert scientific and technological developments into new products, processes, applications, materials, or services.	Number of users able to convert scientific and technological developments into new products, processes, applications, materials, or services	Regional F&V road map monitoring report		✓		EAC Secretariat, International partners, Technology development institutions in the Partner States, Industry associations	450,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Provide targeted technological support to small scale processors across the region	• Technical assistance • Exchange programs • Training	Increased ability of small-scale processors to use technology to expand their business operations	The number of technology transfer facilities in the region specifically targeting the small-scale processors.	Regional F&V road map monitoring report		✓		EAC Secretariat, International partners, Technology development institutions in the Partner States, Industry associations	870,000
Establish regional technology and innovation laboratories that meets international standards	• Technical assistance • Exchange programs • Training	Partner States have internationally accredited laboratories for plant health diagnosis, soil, and water testing.	Internationally accredited laboratories for plant health diagnosis, soil and water testing established in the Partner States	Regional F&V road map monitoring report			✓	EAC Secretariat, International partners, Technology development institutions in the Partner States, Industry associations	3,000,000
Enhance and secure Intellectual Property registration and enforcement mechanisms	• Technical assistance • Exchange programs • Training	Increased ability to enhance and secure Intellectual Property registration and enforcement mechanisms	Number of innovation support institutions supported with appropriate mechanisms for protecting their innovations	Innovation institutions reports			✓	EAC Secretariat, International partners, Technology development institutions in the Partner States, Industry associations	810,000
Incorporate targeted measures to improve the resilience of the sector	• Capacity building program/ training • Technical assistance • Training	Increase the ability of small-scale farmers to safeguard their livelihoods and business operations against unforeseen events and natural disasters (financial losses for value chain actors).	Necessary safety nets and resilience measures established and operational e.g. crop insurance system	Survey reports Perception's survey	✓			EAC Secretariat, National Ministries, International partners, Industry associations	870,000

Strategic Object 2: Strengthen R&D, innovation and processing technologies
Outcome 2: Availability and accessibility to appropriate R&D services, value addition technology enhanced

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Use technology and innovation to improve the quality of products put on the market	- Capacity building program/ training - Technical assistance	The quality of products put on the market improved through technology and innovation	Number of products with improved quality put on the market	- Survey reports - Perception's survey		✓		Processors and manufacturers, Technology development institutions in the Partner States	350,000
Use technology and innovation to increase the commercialization rate of processed F&V products	- Capacity building program/ training - Technical assistance	Increased ability of technology and innovation to trigger commercialize processed F&V products	Number of products commercialized through use of technology and innovation	- Survey reports - Perception's survey		✓		Processors and manufacturers, Technology development institutions in the Partner States	400,000
Promote product diversification	- Capacity building program/ training - Technical assistance	The ability of the industry to diversify products in line with market requirements	Number of new products	- Survey reports - Perception's survey	✓			Processors and manufacturers, Technology development institutions in the Partner States	300,000
Conduct sensory studies for product acceptability	- Capacity building program/ training - Technical assistance	Increased ability to respond to customer tastes and product preferences	Number of sensory studies conducted and results implemented	- Survey reports - Perception's survey	✓			Processors and manufacturers, Technology development institutions in the Partner States	150,000
Identify specific F&V products for the pilot processing scheme	- Capacity building program/ training - Technical assistance	Priority products identified	Number of priority products identified from the pilot scheme	- Survey reports - Perception's survey	✓			Processors and manufacturers, Technology development institutions in the Partner States	50,000
Use Innovation and innovation to attract youth in the horticulture sector	- Capacity building program/ training - Technical assistance	Number of ICT solutions developed and used by the youth population	Number of ICT solutions developed and used by the youth population	- Survey reports - Perception's survey		✓		Youth Groups, Processors and manufacturers, Technology development institutions in the Partner States	450,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Reinforce agro-based PPP's to drive technology to a wide range of SMEs	- Capacity building program/ training - Technical assistance - Training	Environment for creating an enabling development for technological innovation has improved	Number of established PPP partnerships in processing technologies (e.g. cluster partnerships and business incubation schemes)	- Partnership reports - Manufacturer's processing and sales data - Road map reports		✓		Partner States, EAC Secretariat, Industry associations, Processors and manufacturers, Technology development institutions in the Partner States	810,000
Improve access to locally sourced processing technologies	- Training - Exchange programs - Technical assistance - Incentive schemes and awareness	Existing processing technologies upgraded	Number of new investments in local fabrication technologies	- Partnership reports - Road map reports		✓		Partner States, EAC Secretariat, Industry associations, Processors and manufacturers, Technology development institutions in the Partner States	870,000
Support the medium and large-scale processors to increase access to appropriate imported technologies	- Training and exchange programs - Technical assistance - Incentive schemes and awareness	Improved domestication of existing technologies	Number of medium and large-scale processors supported in accessing appropriate imported technologies	- Partnership reports - Road map reports		✓		Partner States, EAC Secretariat, Industry associations, Processors and manufacturers, Technology development institutions in the Partner States	1,800,000
Conduct targeted campaigns to attract investment in processing activities	- Awareness creation campaigns and roadshows - Technical assistance - Incentive schemes and awareness - Stakeholder consultation meetings	Improved ability of the sector to attract a critical mass of investors in processing activities	Number of new investments in processing activities	- Investment Authority Reports - Partnership reports - Road map reports			✓	Partner States, EAC Secretariat, Industry associations, Processors and manufacturers, international partners	1,200,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Facilitate the establishment of Special Economic Zones (SEZs) for F&V processing	- Awareness creation campaigns and roadshows - Technical assistance - Incentive schemes and awareness - Stakeholder consultation meetings	Improved ability of the region to create a critical mass of processing activities	Number of SEZs established in each partner State	- Investment Authority Reports - Partnership reports - Road map reports			✓	Partner States, EAC Secretariat, Industry associations, Processors and manufacturers, international partners, Investment Promotion Agencies in the respective Partner States	3,600,000
Identify appropriate options for value chain financing in processing activities	- Technical assistance - Stakeholder consultation meetings	Relevant and affordable value chain financing options developed	Number of new options for value chain financing developed and operational	- Road map reports - Reports on new financing options			✓	Financial Institutions, Partner States, EAC Secretariat, Industry associations, international partners	750,000

Strategic Object 3: Develop and improve product packaging services
Outcome 3: Local capacity to manufacture quality packaging materials enhanced

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Awareness creation on the existence of good quality packaging material in the region	• Technical assistance • Exchange visits • Incentive schemes and awareness • Stakeholder consultation meetings	Increased accessibility to information on the available packaging opportunities in the region	Number of participants reporting increased awareness on the existence of packaging materials options in the region	• Survey reports • Perception's survey	✓			Partner States, EAC Secretariat, Industry associations, Processors and manufacturers, international partners	100,000
Attract private sector investment in the manufacture of packaging materials	• Awareness creation campaigns and roadshows • Technical assistance • Incentive schemes and awareness • Stakeholder consultation meetings	Improved ability of the sector to attract a critical mass of investors in the manufacture of packaging materials	Number of new investments in the manufacture of packaging materials	• Investment Authority Reports • Partnership reports • Road map reports		✓		Partner States, EAC Secretariat, Industry associations, Processors and manufacturers, international partners	900,000
Identify measures to reduce the proportion of packaging costs to the total costs of the product	• Technical assistance • Exchange visits • Incentive schemes and awareness • stakeholder consultation meetings	Improved efficiency in the manufacture of packaging materials	Percentage decrease in the unit cost of manufacturing packaging materials	• Partnership reports • Road map reports		✓		EAC Secretariat, Industry associations, Processors and manufacturers, international partners, Industry associations	600,000

Strategic Object 4: Promote market and trade facilitation

Outcome 4: Expanded market share of EAC fruits and vegetable exports in the regional and international markets

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Link smallholder farmers to large commercial entities	• Technical assistance • Exposure visits • Incentive schemes and awareness • Industry networking meetings • Stakeholder consultations • Training and capacity building programs	Increased ability of small-scale farmers to connect to the regional and international markets	Number of small-scale farmers linked to large commercial entities	• Contract reports • Survey reports • Big companies report	✓			EAC Secretariat, Industry associations, large-scale commercial entities, international partners.	750,000
Promote a "cluster" model	• Technical assistance • Incentive schemes and awareness • Stakeholder consultations • Industry networking meetings	Expanded linkages for a critical mass of individual F&V producers and processors to the domestic, regional, and international markets.	The number of individual producers and processors linked to the domestic, regional, and international markets.	• Contract reports • Partnership reports • Road map reports	✓			EAC Secretariat, Industry associations, large-scale commercial entities, international partners.	1,500,000
Establish terminal wholesale markets	• Technical assistance • Awareness meetings and stakeholder consultations • Industry networking meetings • Matchmaking and brokering	Strengthened backward and forward linkages in the F&V sector	Number of terminals whose sale markets established	• Contract reports • Partnership reports • Road map reports	✓			EAC Secretariat, Industry associations, Local Government Authorities (LGAS) in respective partner States, International partners.	2,100,000
Establish service-oriented collection centres/satellite collection centres and packhouses	• Technical assistance • Awareness meetings and stakeholder consultations • Industry networking meetings • Matchmaking and brokering	A sub-sector that can guarantee a consistent and continuous supply of fresh fruit and vegetables	Number of service-oriented collection centres/satellite collection centres and packhouses established	• Contract reports • Partnership reports • Road map reports		✓		EAC Secretariat, Industry associations, Local Government Authorities (LGAS) in respective partner States, International partners.	870,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Promote digital marketing	• Technical assistance • Industry networking meetings • Cost-benefit analysis • Feasibility studies • Matchmaking and brokering	Cost-effective market linkage initiatives for promoting the East African F&V sub-sector to a wider audience.	Number of digital marketing platforms established in the region	• Road map reports • Trend reports		✓		EAC Secretariat, Industry associations, international partners.	300,000
Roll out branding and targeted marketing initiatives	• Technical assistance • Industry networking meetings • Stakeholder consultations • Exchange programs	A brand vision for the EAC fruits and vegetable subsector	A brand vision for the EAC fruits and vegetable subsector developed	• Regional F&V Facilitation Committee reports • Road map reports		✓		EAC Secretariat, Industry associations, international partners.	330,000
Promote cross border trade and engagement with the international market	• Technical assistance • Industry networking meetings • Matchmaking and brokering	Increased ability for small scale farmers to participate in the regional markets/ increased prospects for increasing regional trade	Number of small-scale farmers engaged in the cross-border trade	• Regional F&V Facilitation Committee reports • Road map reports		✓		EAC Secretariat, National ministries, Border Post Authorities and Inspection bodies, Industry associations, international partners.	600,000
Improve market intelligence and dissemination across the whole value chain	• Technical assistance • Value chain studies • Feasibility studies • Promotion campaigns • Industry networking meetings • Stakeholder consultations	An accessible pool of knowledge for the F&V sector	Number of actors trained in undertaking market intelligence research and analysis in the region	• Market research reports • Feasibility study reports • Value chain analysis reports • Road map reports		✓		EAC Secretariat, Government ministries, Producer and processor associations, Industry experts and advisors, international partners.	300,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Strengthen knowledge management system	• Technical assistance • Industry networking meetings • Exchange programs	Enhanced Knowledge Management System" among key actors within the East African F&V value chain	Industry Observatory tool established in the region and operational	Road map reports	✓			EAC Secretariat, Government ministries, Industry associations, Investment Facilitation Authorities in the EAC	300,000
Improve railway transport services	• Technical assistance • Feasibility studies • Targeted investment and campaign efforts • Industry networking meetings	Accelerated rehabilitation and expansion of rail networks to support the development of the F&V sector	Progress in the expansion, rehabilitation, and modernization of railway network and infrastructure and services in the EAC region	• Road map reports • EAC reports • PPP contracts and reports			✓	EAC Secretariat, Government ministries, Investment Authorities in the Partner States, Railway and Infrastructure Authorities, International partners.	600,000
Improve airfreight services	• Technical assistance • Feasibility studies • Targeted investment and campaign efforts • Industry networking meetings	Accelerated rehabilitation and expansion of airfreight infrastructure and services to support the development of the F&V sector	Progress in the expansion, rehabilitation, and modernization of airfreight infrastructure and service network in the EAC region	• Road map reports • EAC reports • PPP contracts and reports			✓	EAC Secretariat, Government ministries, Investment Authorities in the Partner States, Airport and Aviation Authorities, International partners	3,000,000
Strengthen port handling systems and facilities	• Technical assistance • Feasibility studies • Targeted investment and campaign efforts • Industry networking meetings	Accelerated rehabilitation and expansion of port infrastructure and services to support the development of the F&V sector	Progress in the expansion, rehabilitation, and modernization of port infrastructure and service network in the EAC region	• Road map reports • EAC reports • PPP contracts and reports			✓	EAC Secretariat, Government ministries, Investment Authorities in the Partner States, Port Authorities, International partners	3,000,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Improve road transportation system	• Technical assistance • Feasibility studies • Targeted investment and campaign efforts • Industry networking meetings	Accelerated rehabilitation and expansion of road infrastructure and services to support the development of the F&V sector	Progress in the expansion, rehabilitation, and modernization of road infrastructure and service network in the EAC region	• Road map reports • EAC reports • PPP contracts and reports			✓	EAC Secretariat, Government ministries, Investment Authorities, Road Infrastructure Authorities, International partners	3,000,000
Strengthen the Customs Unions Protocol	• Technical assistance • Industry networking meetings	The accelerated flow of goods across EAC borders	Progress in the cargo clearance system across the EAC borders	• EAC reports • Road map reports	✓			EAC Secretariat, National ministries, Border Post Authorities and Inspection bodies, Industry associations, international partners.	900,000

Strategic Object 5: Improve safety and quality infrastructure
Outcome 5: Increased ability to comply to international safety and quality standards for F&V

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Expedite the process of harmonization of East African Standards (EAS)	- Technical assistance - Training - Exchange visits	Harmonized East African standards	- Number of actors complying with international safety and quality standards - Number of personnel trained in international safety and quality standards	- Compliance reports - Trend reports	✓			EAC Secretariat, National Standards Bodies (NSBs), National Accreditation bodies, (NABs), National Plant Protection Organizations (NPPOs), Food Safety Institutions, East African Standards Committee (EASC), Regional and international standardization organizations e.g. the International Organization for Standardization (ISO), National ministries, industry associations, international partners	600,000
Conduct strategic engagements with relevant institutions	- Technical assistance - Industry networking - Meetings and workshops - Exchange visits	The increased ability of EAC to ensure compliance with SPS requirements	EAC Committee on SPS measures established	- Compliance reports - Policy intervention reports	✓			EAC Secretariat, National ministries, industry associations, international partners	300,000
Improve farmers' knowledge of market standards	- Technical assistance - Industry networking - meetings and workshops - Training and capacity building programs - Exchange programs	Improved farmer's understanding of market standards governing the international trade in food products.	Number of farmers successfully applying market standards on international trade in F&Vs	- Survey reports - Compliance reports - Road map reports	✓			EAC Secretariat, National ministries, industry associations, international partners	450,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Build the capacity of enterprises to comply with international standards and market requirements	• Technical assistance • Exchange programs • Quality infrastructure support • Training	Improved ability of national laboratories to perform internationally-recognized testing and calibrations	• Number of accredited institutions supported to perform internationally-recognized product testing and calibrations • Increased capacity of accreditation institutions to accredit laboratories, system certifiers, and inspection bodies	• Survey reports • Compliance reports • Road map reports	✓			EAC Secretariat, National ministries, industry associations, international partners	2,000,000
Harmonize the technical requirements across the region, and in the export markets	• Technical assistance • Exchange programs • Quality infrastructure support • Training	Enhanced ability for EAC to adapt and institutionalize uniform technical requirements and specifications across the region	• Progress in harmonizing technical regulations, • A robust system for notification of new technical regulations established • A standardization system for Food Standards within the EAC, Africa region, and internationally	• Survey reports • Compliance reports • Road map reports		✓		EAC Secretariat, National ministries, NSBs, NPPOs, Food Safety Institutions, EASC, industry associations, international partners	750,000
Build the capacity of the private sector in understanding products standards	• Technical assistance • Exchange programs • Quality infrastructure support • Training	Increased ability for EAC to address the growing significance of private sector requirements for enterprise systems and product standards.	• Number of enterprises supported in understanding product standards • Number of producers supported in performing self-declarations of conformity such as the CE markings and others • Number of enterprises supported in understanding Corporate social responsibility (CSR) requirements of international buyers	• Survey reports • Compliance reports • Road map reports		✓		EAC Secretariat, National ministries, industry associations, international partners	450,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Develop policies and directives specific to the F&V sector	• Technical assistance • Exchange programs • Quality infrastructure support • Training	Enable EAC to take full advantage of the existing international trade policies and agreements and also to interpret them into action in the context of the F&V sector	• Policies and directives specific F&V sector at the regional level. • Progress in interpreting trade policies into action • Standards set for all types of processed fruit juices in place.	• Policy guidelines on EAC strategies to interpret international trade policies in the context of F&Vs • Road map report		✓		EAC Secretariat, National ministries, Regulatory agencies, Industry associations, international partners	450,000
Develop a regional standardization system for agro-input supplies	• Technical assistance • Stakeholder consultative meetings	A system for fast-tracking regionally registered seed varieties more efficient and standardized.	A uniform system for introducing new seed varieties across the region in place and operational	• Survey reports • Compliance reports • Road map reports		✓		EAC Secretariat, National ministries, Regulatory agencies, Industry associations, international partners	300,000
Strengthen the surveillance system and procedures	• Technical assistance • Training and capacity building programs	Increased ability to understand and implement surveillance systems and procedures at exit points	No of exit points able to implement surveillance systems	• Survey reports • Compliance reports • Road map reports		✓		EAC Secretariat, National ministries, airports, ports and road authorities, international partners	500,000
Strengthen the certification and guarantee systems	• Technical assistance • Training and capacity building programs	Increased ability to cope with management and food safety standards adopted in the fresh F&V industry.	No. of actors (i.e. exporters, traders, processors) meeting extra certification and guarantee requirements	• Survey reports • Compliance reports • Road map reports		✓		EAC Secretariat, National ministries, Regulatory agencies, Industry associations, international partners	300,000

Strategic Object 6: Build local skills and knowledge base

Outcome 6: Increased ability to develop and maintain sufficient capacity of industry specific skills

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Conduct curriculum review for local institutions	• Technical assistance • Skills gap analysis • Consultative meetings • Training and industrial attachments	Increased ability for local institutions to produce "job-ready" graduates	• Gap analysis conducted • Database for key industry-specific skills developed • Number of refresher training to align the current skill set to industrial requirements	Curriculum review reports	✓			EAC Secretariat, National Ministries, Academia, Technical, and Vocational Education (TVEs) Institutions, Industry associations, international partners	300,000
Enhance the capacity of the TVET system	• Technical assistance • Consultative meetings	Increased ability of TVET systems to respond to industry needs	• Collaboration between the TVET system and the industry, education, and research institutions improved • Gaps in the National Qualification Frameworks, addressed concerning wider certification, quality assurance, and standardization	• Collaboration agreements reports • Road map reports	✓			EAC Secretariat, National Ministries, Academia, Technical, and Vocational Education (TVEs) Institutions, Industry associations, international partners	1,500,000
Invest in proven models of technology transfer and skills development in the region	• Technical assistance • Consultative meetings • exposure visits • Training and industrial attachments	Enhanced practical skill base of lower field practitioners	Increased technological transfer infrastructure between the industry, academia, and research and industrial training institutions	• Collaboration agreements reports • Road map reports		✓		EAC Secretariat, National Ministries, Academia, Technical, and Vocational Education (TVEs) Institutions, Industry associations, international partners	450,000
Invest in selected higher-level specialized skills	• Technical assistance • High-level education/ training	Promote "thought leadership" in the industry	Number of practitioners receiving higher education in specialized skills	• Trend reports • Road map reports		✓		EAC Secretariat, National Ministries, Academia, Industry associations, international partners	1,500,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Develop strategic linkages with the private sector	• Technical assistance • Consultative meetings • Exposure visits and exchange programs	Increased ability of the industry to address the needs of the private sector	Number of industrial attachments; internships, incubation, and apprenticeship schemes	• Collaboration agreements reports • Road map reports		✓		EAC Secretariat, National Ministries, Academia, Technical, and Vocational Education (TVEs) Institutions, Industry associations, international partners	750,000
Develop regional wide skill development policies	Technical assistance Consultative meetings	Regional wide skill development policy for the FBV sector	Skills development policies in place at the regional level	• Policy documents and reports • Road map reports	✓			EAC Secretariat, National Ministries, Academia, Technical, and Vocational Education (TVEs) Institutions, Industry associations, international partners	300,000

Strategic Object 7: Strengthen the coordination, institutional and policy framework
Outcome 7: Enhanced industry coordination institutional and policy framework

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Establish national and regional sub-sector coordination platform	Stakeholder meetings	A formal mechanism for bringing together various value chain actors to discuss issues of mutual interest.	Regional Subsector Coordination Committee" (RSSC) established	Meeting reports	✓			EAC Secretariat, National Ministries, Industry associations, international partners	300,000
Facilitate and fast-track the implementation of existing policies	• Technical assistance • Consultative meetings	Increased ability to track policy changes	Mechanisms for tracking policy changes established and operational	• Policy documents and reports • Road map reports	✓			EAC Secretariat, National Ministries, Industry associations, international partners	270,000
Provide capacity building for the implementation of the Strategy	• Technical assistance • Consultative meetings	Increased institutional capacity to oversee the implementation of F&V Strategy in the respective Partner States	Number of training programs in specific areas of competency	• Training reports • Road map reports		✓		EAC Secretariat, Government Ministries and Agencies, National institutions, Industry associations, international partners	390,000
Incorporate advocacy component in the F&V Strategy.	• Technical assistance • Consultative meetings	Increased ability to advocate policy-related issues affecting the industry	Public-Private Dialogue (PPD) structure in place and operational	• PPD reports • Road map reports		✓		EAC Secretariat, Government Ministries, Local Government Authorities (LGAs) Industry associations, international partners	150,000

Strategic Object 8: Promote nutritional and medicinal indigenous F&Vs

Outcome 8: Social dimensions addressed in the Strategy

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Create market pull to increase consumption and production of selected F&Vs	• Technical assistance • Awareness programs • Training	Increase ability to document and showcase alternative consumption for F&Vs	Increased market consumption of selected F&V products	• Survey reports • Training reports • Road map reports	✓				100,000
Promote production and consumption of indigenous fruits and vegetables	• Technical assistance • Awareness programs • Training	The nutritional status of households improved	Increased awareness of nutrition-dense F&Vs available in the region Increased consumption of nutrient-dense traditional African fruits and vegetables Database for important species which could be used to address nutritional challenges across the region	• Survey reports • Training reports • Road map reports		✓		EAC Secretariat, Government Ministries and Agencies, National Institutions, Industry associations, International partners	750,000
Promote preservation technologies	• Technical assistance • Awareness programs • Training	Increased ability to address nutrition erosion of the indigenous fruits and vegetables	Number of people trained in preservation technologies	• Survey reports • Training reports • Road map reports		✓		EAC Secretariat, Government Ministries and Agencies, National Institutions, Industry associations, International partners	900,000
Document and showcase the medicinal F&V segment	• Technical assistance • Awareness programs • Training	Increased ability to exploit the medicinal properties of indigenous fruits and vegetables	Number of evidence-based research on medicinal attributes of selected indigenous fruits and vegetables Database for important species which could be used to address specific health challenges across the region	• Survey reports • Training reports • Road map reports		✓		EAC Secretariat, Research Institutions, International partners	450,000

Activities	Inputs	Outputs	Indicators	Means of verification	Timeframe			Responsibilities	Estimated Budget (USD)
					2021-2024	2024-2027	2027-2031		
Promote production and consumption of medicinal F&V	• Technical assistance programs • Awareness programs • Training	Commercial production of medicinal F&V	Increase in the production of medicinal F&Vs Increase in the consumption of medicinal F&Vs	• Survey reports • Training reports • Road map reports		✓		EAC Secretariat, Government Ministries and Agencies, National institutions, Industry associations, International partners	750,000
Attract investment in the manufacture of medicinal products	• Technical assistance • Consultative meetings • Exposure visits and exchange programs	Increased ability to attract a critical mass of investments in the manufacture of medicinal products	Business opportunities within the medicinal F&V segment unveiled, documented, and showcased Number of public and private sector entities willing to invest in the production of medicinal based F&V products Appropriate incentives schemes embedded in the program to attract meaningful investment Networking mechanism to enhance interaction across horticulture, health, and education sectors within the Partner States Needs and areas of further development identified	• Survey reports • Road map reports • Investment reports		✓		EAC Secretariat, Government Ministries and Agencies, National institutions, Industry associations, International partners	600,000

Budget Summaries (USD)

Budgets (USD)			
2021-2024	2024-2027	2027-2031	Total
17,940,000.00	24,200,000.00	21,360,000.00	63,500,000.00

Annex 2: List of African Indigenous/Leafy Vegetables (AI/LVs) Grown in Easter Africa

Botanical Name	Common Name (English)	Jina kwa Swahili
<i>Abelmoschus esculentus</i>	Okra, Lady's-finger	
<i>Acalypha biparlita</i>	Jacob's coat	Mhacha
<i>Amaranthus cruentus</i>	Red amaranth	Mchicha
<i>Amaranthus dubius</i>	Spleen amaranth	Mchicha
<i>Amaranthus lividus</i>	Livid amaranth	Mchicha
<i>Amaranthus spinosus</i>	Prickly amaranth, pigweed	Mchicha
<i>Basella alba</i>	Vine spinach	
<i>Bidens pilosa</i>	Black-jack	
<i>Citrullus lanatus</i>	Watermelon	Tikitimaji
<i>Cleome gynandra</i>	Stinkweed.	Saga
<i>Colocasia esculenta</i>	Taro, yam	Magimbi
<i>Corchorus olitorius</i>	Jew's mallow	
<i>Crotalaria brevidens</i>	Rattlepod	
<i>Cucurbita maxima</i>	Giant pumpkin/squash	
<i>Cucurbita moschata</i>	Pumpkin	
<i>Hibiscus sabdariffa</i>	Roselle	
<i>Ipomea batatas</i>	Sweetpotato	
<i>Lagenaria siceraria</i>	Bottle gourd	
<i>Manihot esculenta</i>	Cassava	
<i>Moringa oleifera</i>	Drumstick	
<i>Moringa stenopetala</i>	Cabbage tree	
<i>Portulaca quadrifida</i>	Purslane, chick-weed	
<i>Senna occidentalis</i>	Septic-weed, coffee-weed	
<i>Sesamum angustifolium</i>	Simsim	Mfuta, mlenda mwitu
<i>Sesamum calycium</i>	Wild simsim	Mlenda-gwa-wima
<i>Sida acuta</i>	Common wireweed, sida	
<i>Solanum aethiopicum/gilo</i>	Eggplant	
<i>Solanum indicum</i>	African eggplant, bush tomato	
<i>Solanum nigrum</i>	European black nightshade	
<i>Solanum scabrum</i>	African/black nightshade	
<i>Sonchus oleraceus/carnutus</i>	Common sowthistle	
<i>Talinium triangulare</i>	Waterleaf, Ceylon spinach	
<i>Vernonia amygdalina</i>	Bitter leaf	
<i>Vigna unguiculata</i>	Cow pea	

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