EABC

EAST AFRICAN BUSINESS COUNCIL

The Voice of the Private Sector in East Africa

IMPACT OF GLOBAL CRISES ON FOOD SECURITY IN THE EAST AFRICAN COMMUNITY

Analysis and Identification of Selected Food Products and Measures to Improve Food Security in the EAC amid Global Crises

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Acronyms

AfCFTA	African Continental Free Trade Area
AfDB	African Development Bank
ARPF	Animal Resources Policy framework
ASDP	Agricultural Sector Development Program
ASDS	Agricultural Sector Development Strategy
ASIP	Agriculture Sector Investment Plan
ASSP	Agriculture Sector Strategic Plan
ASTGS	Agricultural Sector Transformation and Growth Strategy
ATA-DRC	Agenda for the Transformation of Agriculture in the Democratic Republic of Congo
AUDA-NEPDA	African Union Development Agency
CAADP	Comprehensive Africa Agriculture Development Programme
CBO	Community Based Organization
CERAGRU	Centre de Recherche en Agrumiculture
COMESA	Common Market for Eastern and Southern Africa
COVID-19	Coronavirus disease
DES	Dietary Energy Supply
DTMA	Drought Tolerant Maize for Africa
EABC	East Africa Business Council
EAC ARDP	EAC Agriculture and Rural Development Policy
EAC FNSP	EAC Food and Nutrition Security Policy
EAC	East African Community
EAC-ARDS	EAC Agriculture and Rural Development Strategy
EDPRS	Economic Development and Poverty Reduction Strategy
ES	Export Specialization (Index)
FAO	Food and Agriculture Organization of the United Nations
FAO	Food and Agriculture Organization of the United Nations
FAPF	Food and Agricultural Policy Framework
FAW	Fall Army Worm
FBO	Faith Based Organization
FCS	Food Consumption Scale
FEED	Fortifying Equality and Economic Diversification for Resilience
FFEPP	Fish Farming and Enterprise and Productivity Programme
FLW	Food Loss and Waste
FTA	Free Trade Area
GDP	Gross Domestic Product
GFSI	Global Food Security Index
GHG	Green House Gas
GHI	Global Hunger Index
HHS	Households
HQCF	High-Quality Cassava Flour
IDR	Import Dependency Ratio

IFAD	International Fund for Agricultural Development
IGAD	Intergovernmental Authority on Development
IIT	Intra-Industry Trade
IMAS	Improved Maize for African Soils
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
LIC	Low-Income Countries
LPG	Liquified Petroleum Gas
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MOALFI	Ministry of Agriculture, Livestock, Fisheries and Irrigation
MSME	Micro, Small and Medium Enterprise
NAP	National Agriculture Policy
NFNSP-IF	National Food and Nutrition Security Policy Implementation Framework
NFRA	National Food Reserve Agency
NGO	Non-Governmental Organization
NPCP-SS-PEG	National Program for the Capitalization of Peace, Social Stability, and the promotion of economic growth
NST	National Strategy for Transformation
NUE	Nitrogen Use Efficient
OWC	Operation Wealth Creation
PHC	Les Plantations et Huileries du Congo
PNDA	National Agricultural Development Program
PoU	Prevalence of Undernourishment
PSTA	Strategic Plan for Agricultural Transformation
PVA	Agricultural Voluntary Program
RCA	Revealed Comparative Advantage
REC	Regional Economic Community
SADC	Southern African Development Community
SAH	Semi Autotrophic Hydroponics
SDG	Sustainable Development Goal
SSA	Sub-Saharan Africa
SSR	Self-Sufficiency Ratio
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAAT	Technologies for African Agricultural Transformation
TAFSIP	Tanzania Agriculture and Food Security Investment Plan
TP	Transformation Pathway
UFNSIP	Uganda Food and Nutrition Strategy and Investment Plan
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WEMA	Water Efficient Maize for Africa
WFP	World Food Programme
WHO	World Health Organization
WTO	World Trade Organization

Executive Summary

I. Global Food Situation

The economic and socio-political shocks of the past few years have only exacerbated an already-weakening food environment. The world is now facing the third global food price crisis in 15 years with prices at record highs, during which period, consumer prices rose to record levels with the onset of the COVID-19 pandemic in 2020, impacting food security and the onset of Ukraine -Russia war in 2022. Other challenges emanate from the structural issues and significant risks in the global food system, which include, volatility in agricultural production, scarcity of natural resources, increasing economic inequality, and trade and supply-chain volatility. This is explicit from the four component indicators namely; undernourishment, child stunting, child wasting and child mortality, all of which are declining. Africa leads in food insecurity with more than a fifth of its population being victims, which is twice higher the world average.

E 1: Linkages between global crises and regional food security

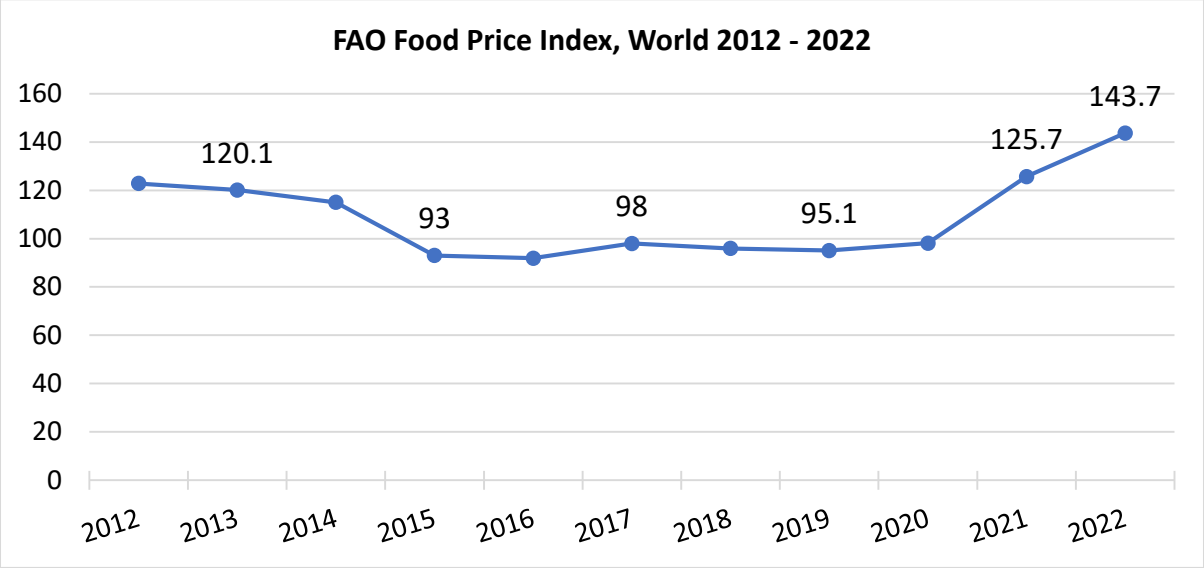
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
GLOBAL												
GFSI												
Climate change												
COVID 19												
Ukraine-Russia war												
EAC												
Food Production Index												
Climate change												
COVID 19												
Ukraine-Russia War												
Food inputs												
Energy												
Food Inflation												
Freight costs												
ER												
Food imports												
Affordability												
Undernourishment												

Source: Authors Calculations

Due to its impact on food production, climate change is the dominant factor in diminishing global food security and nutrition. Nevertheless, there is an adequate global supply of cereals, foods critical for energy in the general diets of the population. However, food prices increased in the recent past due to bottlenecks in supply chains, soaring input costs (fertilizer, fuel, etc) and transport costs and other disruptions caused by the COVID-19 pandemic. The costs of energy, fertilizer and commodity prices have surged since the Ukraine conflict started in 2020, triggering price increases in 2022 of up to 49% energy, 39% food, and 62% fertilizer; from 2019 levels. In addition, the Russia-Ukraine war, among the biggest suppliers of cereals,

interrupted global food trade especially in the low-income import dependent countries, mostly in the African continent.

E 2: FAO Global Food Price Index 2012 - 2022

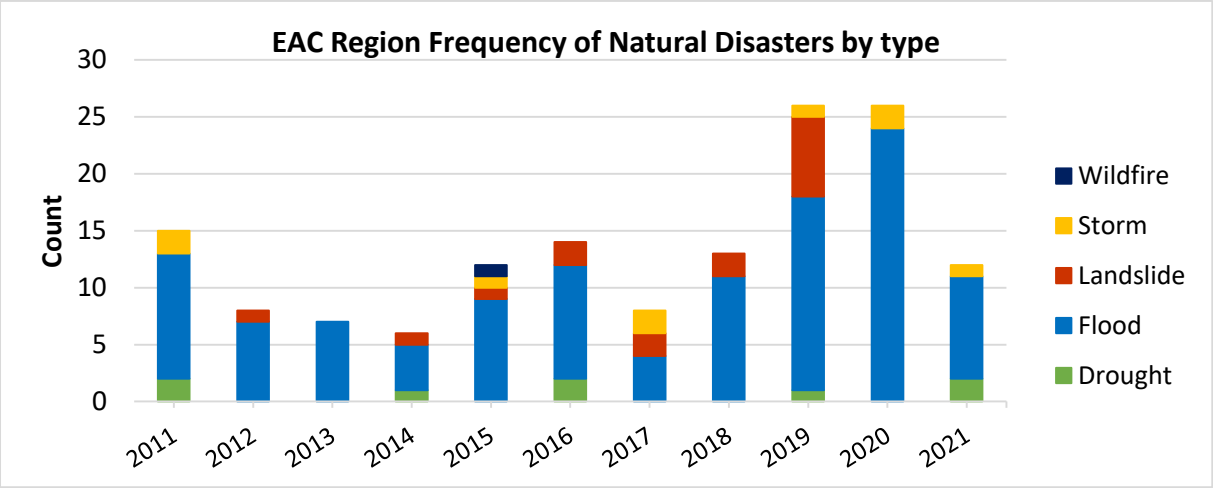


Source: FAO 2023. FAOSTAT: Prices

II. Impact of global crises on EAC region food security

The EAC food baskets are characterized by low-energy dietary products consisting of tubers, roots, plantains and less cereals which have to be met from imports. Most rural households get their livelihoods from staple food production, and diets with low energy. Furthermore, agriculture in the EAC, like other continental countries, is rainfed, thus susceptible to the vagaries of climate change. In this regard, climate change with the multiplier effect on hunger and food insecurity, poverty and income levels, and scarcity of already limited natural resources, remains critical in food security in the EAC.

E 3: EAC Frequency of Natural Disasters by type 2011 - 2021

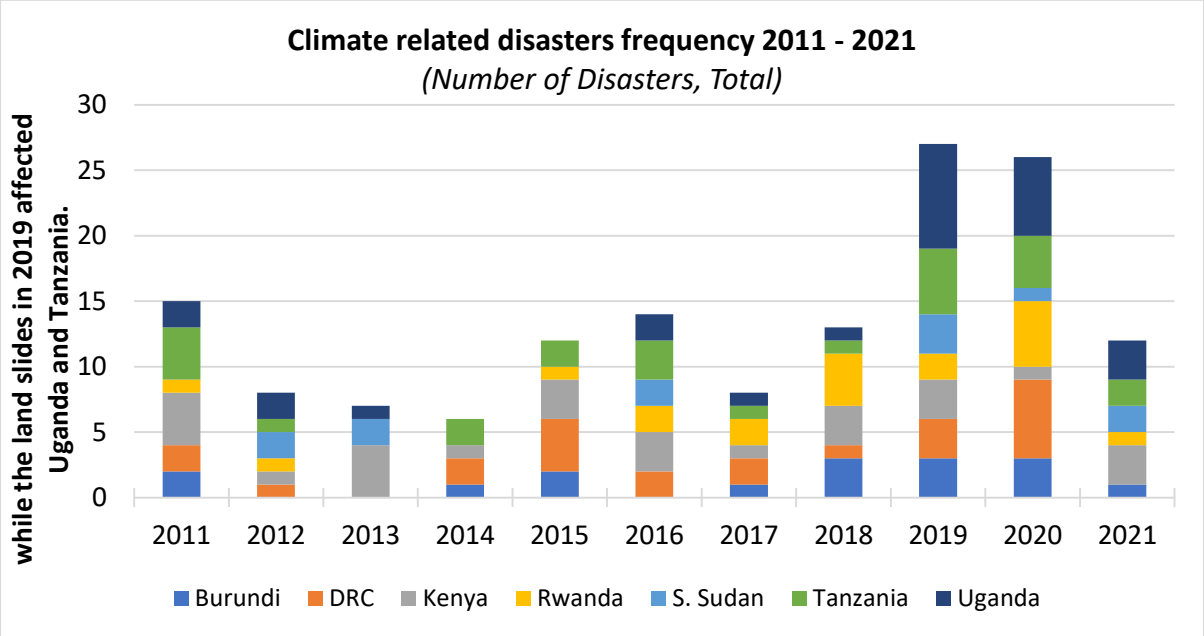


Source: International Monetary Fund. 2023.Climate Change Indicators Dashboard

At county level, the disasters in E.3 confirm that each of the countries in the region experience some form of climatic challenge. However, the severity of the challenges does not cut across the whole

region, creating opportunities for food production for trading in the region. The floods in 2011 affected Kenya and Tanzania.

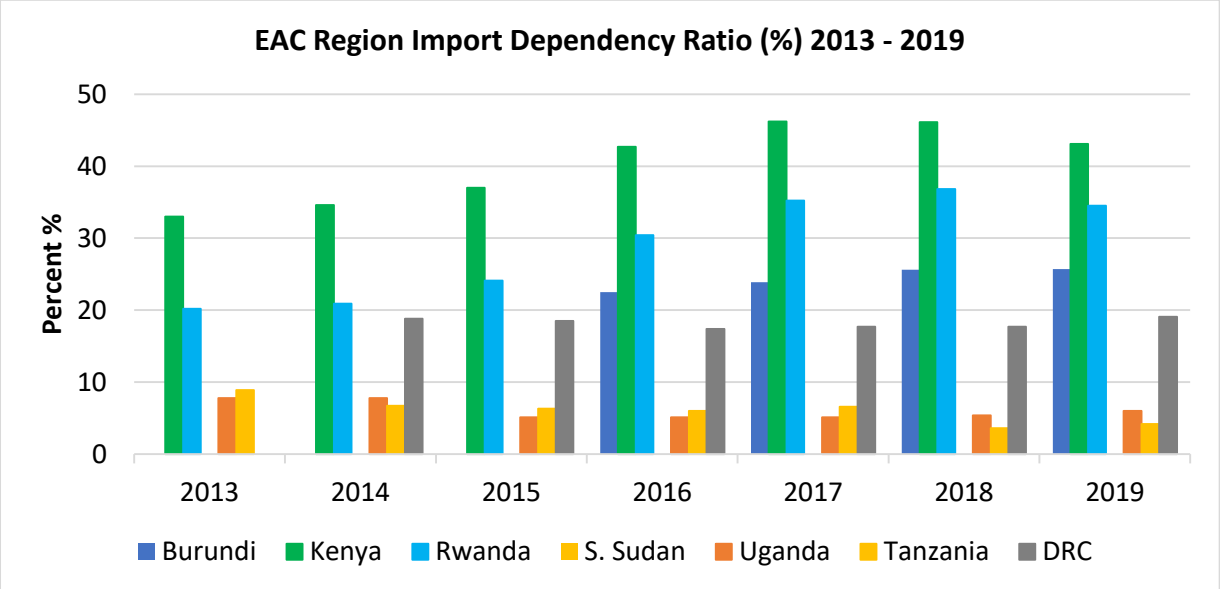
E 1: Frequency of Natural Disasters in the EAC 2011 - 2021 *(count)*



Source: International Monetary Fund. 2023.Climate Change Indicators Dashboard

With Ukraine being a major producer and exporter of cereals, the Russia-Ukraine war has had a significant effect on the supply chain of food, leading to disruption in the food security of most countries. The EAC region remains perpetually food insecure, with all the food security indicators reflecting negative trends in the study period. This is worsened by export restrictions which usually target trade in cereals and other high energy diets staple foods that account for the food security of a country. Food inflation has maintained an upward trend, making food affordability a challenge. Kenya and Rwanda import substantial quantities of the cereal requirements.

E 2: EAC Cereal Import Dependency Ration (%) 2013 - 2019



Source: FAO 2023. World Food and Agriculture Statistical Yearbook 2022

Although there are national and regional food security policies in place, the economic crisis triggered by the COVID-19 pandemic led to a widening the gap in employment, incomes losses, and access to food. The global lockdowns to manage the spread of the pandemic impacted negatively on global trade, with a negative effect on country incomes, input and transport costs. The majority of the EAC population is engaged in smallholder agriculture, predominantly in smallholder mixed farming of livestock, food crops (maize, rice, potatoes, bananas, cassava, beans, vegetables, sugar, wheat, sorghum, millet and pulses), cash crops, fishing and aquaculture. The high input costs from prices of imported energy (fuel), freight, fertilizer and other imported agricultural-related inputs (e.g., seeds), make agriculture a very expensing undertaking, especially for smallholder farms. Furthermore, the smallholder farmers contribute to value-added industries, the majority of which are SMEs, with no muscle to engage in global trade.

The disparities in the impact of the pandemic and the recovery, together with the limited coverage and duration of the social protection measures, led to widening inequalities that are among the root causes of food insecurity. Thus, it is likely that growing inequalities in 2020 weakened the capacity of the global and regional economic recovery to translate into increased food insecurity, as is reflected in the growing number of people facing difficulties in accessing food. Prevalence in undernourishment was prevalent in the communities dependent on tubers, roots and plantains with less vegetable and fruit intake. These are the same food products that are traded in the region. Food insecurity was exacerbated by export bans and the imposition of export taxes making food prices making high energy food out of reach for the poor.

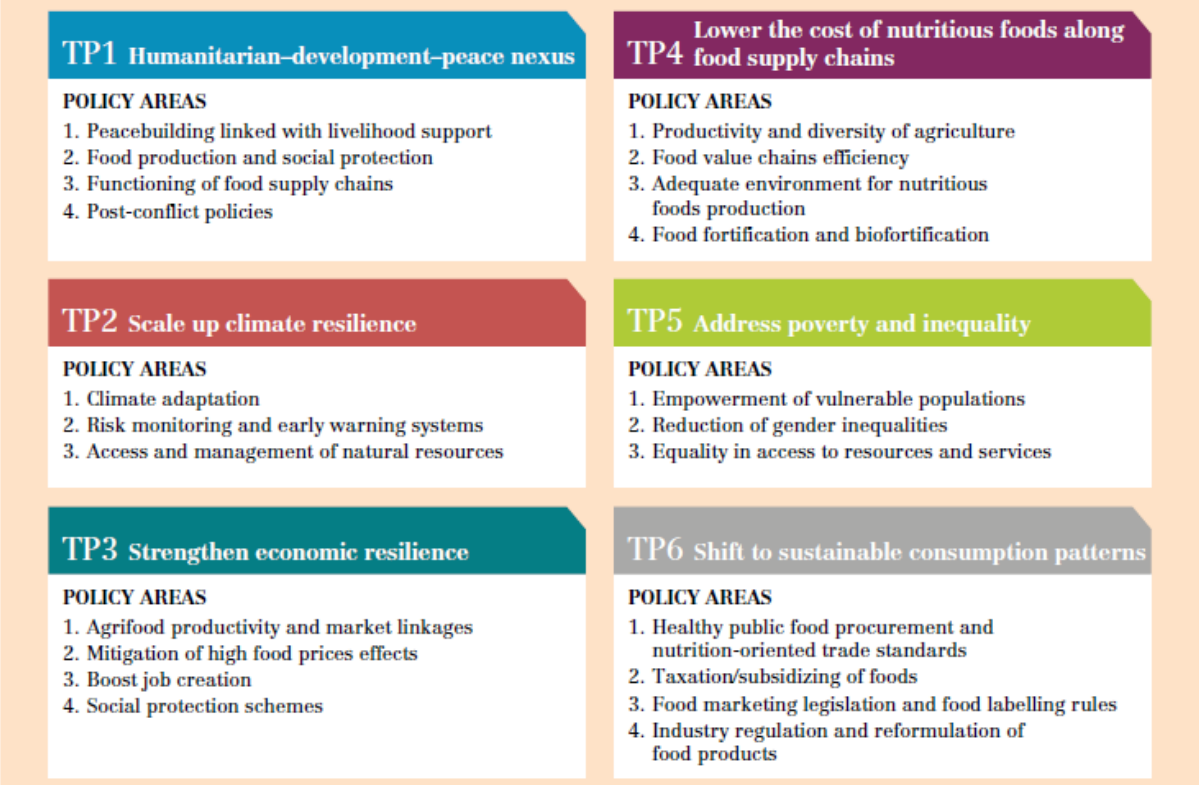
Other challenges for enhancing farmer productivity include low technology adoption, skill gaps, continued reliance on rainfed agriculture, poor crop and animal husbandry practices, poor involvement of the private sector in establishment of the business environment, divergent national agricultural policies and regulations limiting regional trade and value addition, low shelf-life of the agricultural produce, lack of effective food reserve policies, limited information access on timely seasonal climate variabilities, and global price variabilities for the critical high energy food products.

The weak fiscal position of the national government limits potential public sector interventions with regard to production and humanitarian support. Similarly, macro-challenges from inflationary pressures include devaluation of currencies, and expanding current account deficits in the process increasing the debt burden. Taken together, the challenges originating from global crises-especially climate change, disease and insecurity- exacerbated poverty with associated low affordability and accessibility of nutritious diets. Nevertheless, the regional markets with complementary institutional frameworks create market access opportunities for trade and value addition and diversification, and the emergence of new substitute food crops.

III. Way Forward

A multi-sectoral approach to addressing food security and nutrition is necessary in ensuring food availability, increase yields, and diversity in the value chain, among other interventions. To achieve this the agri-food systems must be transformed in ways that ensure they deliver

lower-cost and safe nutritious foods that make healthy diets more affordable for all, sustainably and inclusively. This will encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products. To this end, governments must repurpose policy support to make healthy diets more affordable sustainably and inclusively. In this regard, the region will have to leverage its long history of food and agricultural policy support, mostly motivated by the need to promote agricultural productivity to ensure food availability, particularly from staple cereals, protect farm incomes and/ to ensure food security. A complementary enhanced conducive regional business environment is critical for the private sector to take advantage of the EAC integration process, and continental and international trade agreements.



Source: UNFAO, 2022

Changes in approach to agriculture by both the government and private sectors including farmers and development partners to boost resilient, reinvigorated and strengthened regional value chains in agriculture and agro processing for increased food security in selected food products will reinvigorate the regional economies, while engaging in value addition and processing of grains, edible oil, fertilizers and major staple food in the region. Complementary measures for institutional building and capacity building will be built to take advantage of regional, continental, and global markets access, technological transfer critical for product diversification, import substitution, and competitiveness. There is also a need for exploring new emerging value chains in the food industry that require the adoption of technology, new farming practices, and expansion of businesses by SMEs involved in value addition. Expansion of income opportunities will benefit from expansion and diversification of export markets.

In order to entrench food availability and resilience, local innovations complemented with incentive schemes, have to be prioritized to create substitutions and diversification options of selected regional food products against major food import products; to overcome producer challenges to create opportunities for both Micro Small Medium Enterprises (MSME), youth and women, and large companies engaging in value addition and processing of grains, edible oil, fertilizers and major staple food in the region. More importantly, there is a need to invest in stocking food reserves to meet dietary needs during lean seasons, and **diversify food production on drought-resistant short-term maturing crops to mitigate climate change vagaries**. It will also be critical to invest in institutional strengthening and capacity building for the different players to synergize in exploiting available diverse markets.

This report is presented in four parts. Part I on background introduces the subject of the study with regard to the impact of global crises on food security while Part II assesses the impact of the crises on food availability, affordability, nutrition and sustainability. Part III on the impact of global crises on EAC, in form of climate change, COVID 19 and the Russia-Ukraine war. Part IV analyzes the socio-economic effects of the global crises while Part V on the way forward highlights key interventions for resilience and sustainable food security. A standalone policy brief crystallizes critical interventions for resilience at the EAC and country levels.

PART I: BACKGROUND, APPROACH AND METHODOLOGY

1.0 INTRODUCTION

1.1 Background

The East Africa Community (EAC)[1] comprising of Kenya, Uganda, Tanzania, Rwanda, Burundi, South Sudan, and the Democratic Republic of Congo (DRC) had been experiencing steady economic growth over the years. This trend continued until disruptions related to pandemics and war came about recently. Most notable is the COVID-19 pandemic which began in early 2020, and the current Russia-Ukraine war of 2022 which led to sanctions imposed on Russia. Others included the infestation by desert locusts, food insecurity, flooding and landslides.

The COVID-19 pandemic greatly impacted international trade and supply chains thus pushing up the Global Food Price index of many commodities, such as cereals, meat, and dairy by 26%. On the other hand, the Russia-Ukraine war further worsened the inflation of its major exports to the rest of the world. Particularly, the price of wheat and sunflower oil whose exports to the rest of the world rose by 30% and 55% respectively. Other significant exports of Russia and Ukraine which experienced inflation were maize, barley, and rapeseed oil. Fertilizer imports to the EAC were greatly impacted due to economic sanctions imposed on Russia and Belarus.

These disruptions occasioned by the Covid-19 pandemic as well as the Russia-Ukraine war affected both imports and exports to and from the EAC of major commodities. Not only was wheat and fertilizer affected, but also imports such as iron and aluminium products, machines, pharmaceuticals, and exports (horticultural products, flowers, coffee, tobacco and tea).

Due to the rising inflation, the EAC Partner States introduced subsidies on fuel prices and lowering import duties on food grains such as wheat, barley, edible oil, rice, sugar and maize. In order to cushion the public from the high cost of living, businesses were challenged to control the cost of doing business to make the final products affordable to the public.

1.2 Rationale of the Study

The EAC Agriculture and Food Security Policy is enunciated in the EAC Treaty (1999) and various key agricultural sector policies including the EAC Agriculture and Rural Development Policy (EAC-ARDP), the East African Community Food and Nutrition Security Policy (FNSP), the EAC Vision 2050, and the various EAC 5-year Development Strategies "to attain food and nutrition security for all the people."

The regional economies are agriculture based. Despite this, half of the countries in the Eastern Africa sub-region are net food importers – thus extremely vulnerable to higher global food prices. Furthermore, most of the countries in the region are heavily dependent on imported fuel

[1] DRC which joined in 2022 has been included in the analysis for purposes of deriving advocacy issues going forward.

and hence impacted by higher global energy prices. As the region's economic mainstay, agriculture is expected to drive industrial transformation and economic prosperity in the region.

1.3 Objective

The main objective of the study is to analyse and identify selected regional food products and chart the measures to improve food security in the EAC amid the global crises.

Other objectives include:

i) To determine the major exports and imports to and from the EAC.
ii) To examine the price changes of major imports and exports to the EAC
iii) To establish the extent of food shortages experienced in the EAC.
iv) To explore mechanisms of controlling the cost of doing business and citizens' cost of living
v) To propose measures by the Private, Public sector and Development Partners to boost resilient, reinvigorated and strengthened regional value chains in agriculture and agro-processing for increased food security in selected food products in the EAC.
vi) To propose alternative foods in order to counter food insecurity.
vii) To develop and propose policy recommendations to the EAC Partner States on how to mitigate the impact of global crises on food security in the EAC region.
viii) To explore ways of expansion of the export market for the EAC food products

2.0 APPROACH AND METHODOLOGY

2.1 Approach

Through desk review and secondary data analysis complemented with stakeholder consultations, the study responds to the cardinal role of enhancing economic and business growth by improving food security of food commodities of interest to the EAC region. This is done by establishing how much input goes into the production of these foods of interest in terms of fuel, freight, fertilizer and other imported agricultural-related inputs. Thereafter, the yield/ domestic production of food in the EAC and for each Partner State food-specific comparative advantage is determined to establish the share that goes into intra/extra regional exports. The exports are looked at vis-à-vis the available market of the food commodities and inhibiting challenges. Hence, there is a need for entrenching a conducive regional business environment for the private sector to take advantage of the EAC integration process, and continental and international trade agreements; as well as benchmarking international best practices during periods of intense regional and global shocks.

In order to determine whether there is a deficit in production, the forecasted demand vs the yield is established. The yield was subjected to the prevailing climatic conditions, local innovations, substitutions and diversification options of selected regional food products against the selected major food import products, and prevailing policy measures. It then establishes the deficit based on demand to determine how much goes into importation by quantity and price.

Further, the imports and exports of key food products are holistically looked at in the context of current policy measures that impact food production and security in selected value chains at country level; local innovations, including incentive schemes, substitutions and diversification options of selected regional food products against the selected major food import products; and needs/challenges/opportunities of both Micro Small Medium Enterprises (MSME), youth and women, and large companies engaging in value addition and processing of grains, edible oil, fertilizers and major staple food in the region. Thereafter, the study advises on measures to be taken in terms of capacity building, markets access, diversification, import substitution, advisory services, technology transfer to enhance competitiveness; proposes measures to open up export opportunities of select food products; propose opportunities for export/business/product diversification products to new and emerging value chains and options for import substitutions; proposes measures to improve food production to substitute major food imports; propose measures by the Private, Public sector and Development Partners to boost resilient, reinvigorated and strengthened regional value chains in agriculture and agro-processing for increased food security in selected food products; and proposes measures to open up export opportunities for selected food products. The findings of the study were disseminated at the workshop level in a short presentation, in a final adopted report, and in policy briefs.

2.2 Methodology

A descriptive evaluation Research Design (RD) anchored on quantitative and qualitative frameworks to collect and analyse primary and secondary data and information, from desk review, interviews, and online databases, on specific food products of regional interest and

chart requisite measures to improve food security, from a national perceptive was compared with the rest of the world. The qualitative data/information highlights the challenges and recommendations, borrowing from regional and international best practices that impact policy areas in establishing food security. In addition, the indicators quoted in the national and regional analysis are referenced from published international statistical reports.

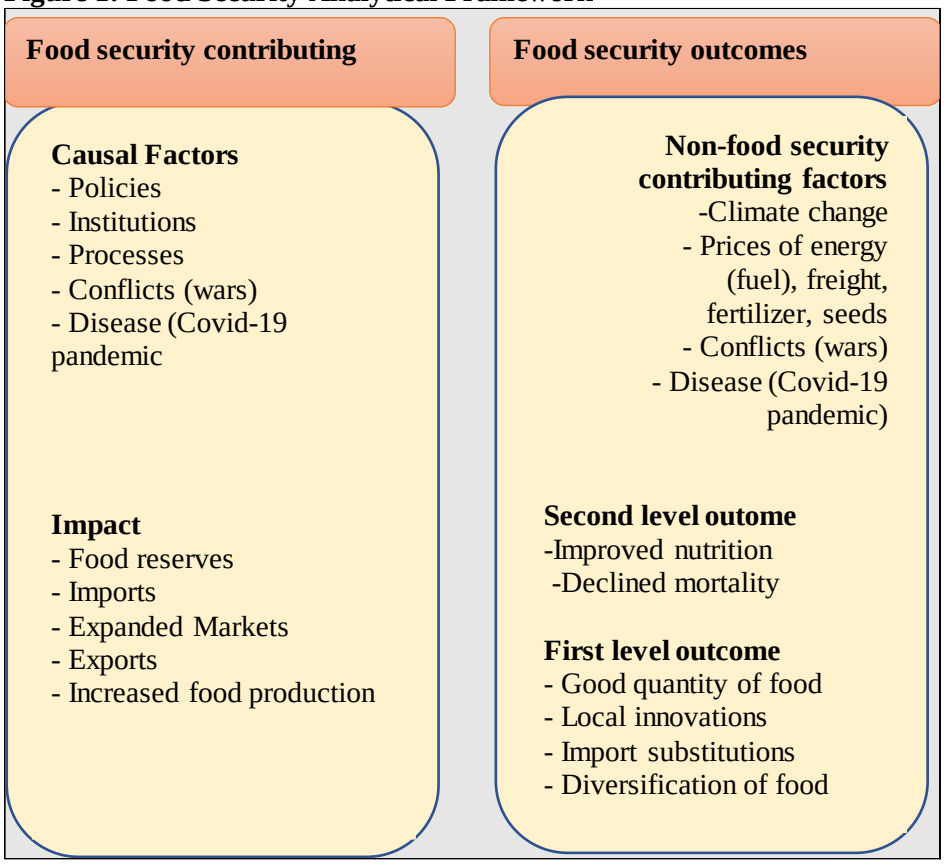
Stakeholder mapping was conducted to enable the Consultant to identify the persons who will be able to provide additional information on food security, climate change and global crises with a focus on identifying problems and recommendations. Their input was also necessary to complement the quantitative work obtained from the international datasets by providing more details as well as explaining additional information on a particular phenomenon. This process of triangulation leads to a detailed understanding of the topic at hand.

2.2.1 Analytical Framework

The impact of the global crises (COVID19 and Ukraine-Russia war) and climate change were analysed in the contest of socio-economic aspects prior to, during and after the crises. At national/regional level, this involved a comparative analysis of the production levels of commodities of interest mostly from 2013 through to 2022; with a focus on the variables that assess food production, GDP, poverty, hunger, nutrition, competitiveness and trade potentials, intra/extra regional food trade in the context of import and export adequacy indicators, input costs (seeds, fertilizer, freight), among others.

The analytical framework borrows from the acceptable and available food security contributing factors and food security outcomes and is presented in *Figure 1* below:

Figure 1: Food Security Analytical Framework



The analysis covered the impact of COVID-19, Ukraine-Russia war, and climate change in the last 20 years on:

1. Global crises and impact on food security in the EAC
2. Price volatility of imports of the selected food products into EAC from the Rest of the World
3. Status of food security, Domestic production data and intra-regional trade related to the selected food products produced in the EAC.
4. EAC regional exports of selected food products to the Rest of the World
5. Prices of energy (fuel), freight, fertilizer and other imported agricultural-related inputs (e.g., seeds)

With the underpinning analytical findings from the study, sustainability forecast demands, both internal and external for the selected food products in the region taking into account the changes in production costs for farmers and companies (capacity, utilization, yield), and showing interlinkage of yields, food supply and prices, to boost resilient, reinvigorated and strengthened regional value chains in agriculture and agro-processing for increased food security in selected food products.

Consequently, the study proposes measures to improve food production to substitute major food imports by addressing:

a) The needs/challenges/opportunities of both Micro Small Medium Enterprises (MSMEs) and large companies engaging in value addition and processing of grains,

edible oil, fertilizers and major staple food in the region and advice on the measures to be taken in terms of capacity building, markets access, diversification, import substitution, advisory services, technological transfer to enhance their competitiveness.

b) Opportunities for export/business/product diversification products to new and emerging value chains and options for import substitutions
c) Export opportunities/ markets for critical crops on food security
d) Measures to open up export opportunities for selected food products.
e) Developing and demonstrating the opportunities for the EAC Partner States to enhance food security and open export opportunities for selected food products.

PART II: IMPACT OF GLOBAL CRISES ON GLOBAL FOOD SITUATION AND PRICES FOR SELECT FOOD AND COMMODITY PRODUCTS.

3.0 IMPACT OF GLOBAL CRISES ON FOOD SECURITY AND FOOD PRICES IN THE WORLD

3.1 Global Food Security Situation

The global food situation is projected to worsen due to overlapping global crises: conflict, climate change, and the economic impact of the COVID-19 pandemic, all of which are strong drivers of hunger. Globally, food security declined in 2021 as the effects of the COVID-19 pandemic continued to hamper progress towards the achievement of SDG 2 goal of creating a world free of hunger by 2030. The unequal pattern of economic recovery in 2021 among countries and the unrecovered income losses among those most affected by the pandemic have exacerbated existing inequalities and worsened the food security situation for the populations already struggling the most to feed their families. Food prices have also increased in the past year due to bottlenecks in supply chains, soaring transport costs and other disruptions caused by the COVID-19 pandemic.

Furthermore, the war in Ukraine, involving two of the biggest producers in agriculture and staple cereals globally, is disrupting supply chains and further affecting global grain, fertilizer and energy prices, leading to shortages of fuel and subsequently leading to inflation in commodity and food prices. On top of this, the growing frequency and intensity of extreme climate events are proving to be a major disrupter of supply chains, especially in low-income countries (LICs) (FAO, 2022). These crises come on top of underlying factors such as poverty, and low agricultural productivity that contribute to chronic hunger and vulnerability. Globally in many regions and countries, existing food systems are inadequate at effectively addressing these challenges and ending hunger.

3.1.1 Global Food Security Index (GFSI)

The Global Food Security Index (GFSI)[2] considers food affordability, availability, quality and safety, and sustainability and adaptation across 113 countries.

Four Pillars of the GFSI

1. ***Economic Resilience*** - Affordability
2. ***Production and agricultural resilience*** - availability
3. ***Nutritional resilience*** - quality and safety
4. ***Environmental resilience*** - sustainability and adaptation

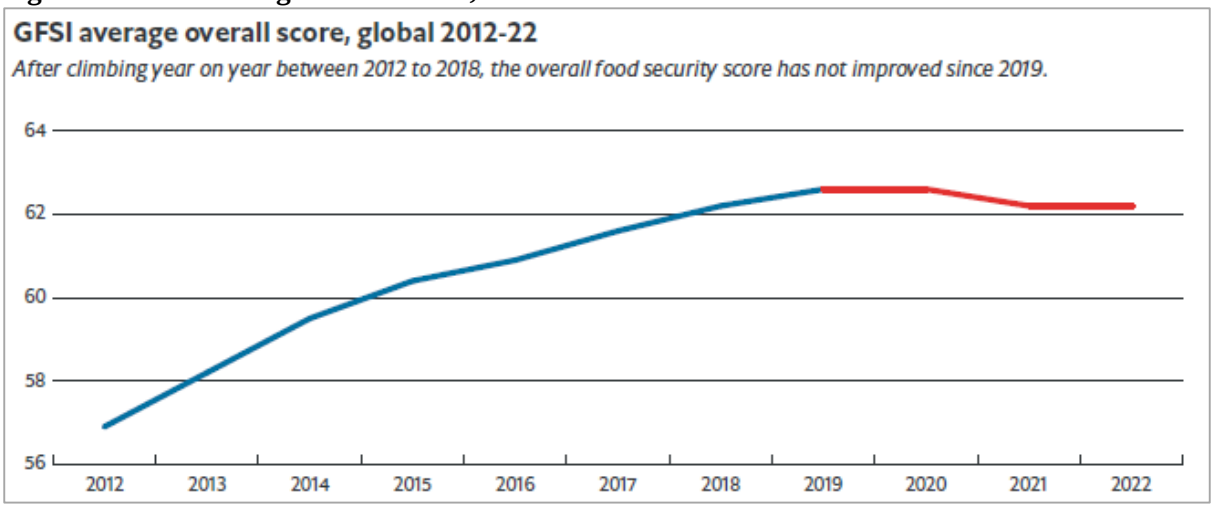
The shocks of 2020 to 2022 highlighted the vulnerability of the global food system and its significance to food security. These more frequent and extensive shocks including covid-19, conflicts, extreme weather events, and soaring costs are exacerbating the systemic weakened food systems.

However, during the period 2015 to 2019, the GFSI witnessed slower growth followed by little change over the next three years after 2019,

[2] The index is constructed using quantitative and qualitative 68 unique indicators that measure the drivers of food security across both developing and developed countries. The closer the score to 100, the better the country in terms of food security. The scores and rankings against all the 113 countries under consideration was prior to and post the Covid-19 pandemic as well as the Russian war.

as the world faced its highest recorded food prices and hunger on an unprecedented scale *(Figure 2)*. In 2022 the index was affected by falls in the two strongest pillars; affordability and food quality and safety; and experienced further weakness in the two other pillars of availability, sustainability and adaptation. Economic resilience/ affordability is a key component of food security as people's welfare is dependent on availability of safe and nutritious food at prices affordable to all.

Figure 2: GFSI Average overall score, Global 2012-2022



Source: Global Food Security Index 2022

The decline in the GFSI average index score from 2019 to 2022 following steady year on year growth in the eight-year period prior *(Figure 2)* reflects the impacts structural issues and risks in the global food system that include volatility in agricultural production, scarcity of natural resources, increasing economic inequality, and trade and supply chain disruptions.

The economic and socio-political shocks of the past few years have only exacerbated an already-weakening food environment. As these shocks become more frequent and severe, global food security will be increasingly threatened. Nevertheless, as observed from *Table 1*, the EAC countries have made steady progress towards improving food security registering positive growth from 2012.

Table 1: 2022 GFSI overall rankings for select countries and net change in overall score, 2022 vs 2012

2022 Rank / 113	Country	Score / 100			Change in Score
		2015	2019	2022	2012 - 2022
1	Finland	79.9	82.9	83.7	+5.3
57	Morocco	53.9	62.8	63.0	+9.1
59	South Africa	64.5	67.3	61.7	+4.6
68	Algeria	50.9	59.8	58.9	+8.4
77	Egypt	61.8	64.5	56.0	+2.2
82	Kenya	41.2	50.7	53.0	+10
88	Rwanda	35.1	48.2	50.6	+4.7
90	Tanzania	33.7	47.6	49.1	+10.2

2022 Rank / 113	Country	Score / 100			Change in Score
		2015	2019	2022	2012 - 2022
93	Uganda	42.8	46.2	47.7	+6.7
105	Sudan	36.5	45.7	42.8	+7.3
104	DRC	30.1	35.7	43.0	+9.3
108	Burundi	25.1	34.3	40.6	-1.4

Source: Global Food Security Index 2022

The EAC region has also been affected by the effects of unprecedented levels of global shocks that have erased gains made in improving food security. Furthermore, the region is still susceptible to the above-mentioned longer-term stresses affecting the global food system which include volatile agricultural production, climate variability and extremes, and trade and supply-chain volatility *(Table 2, Figure 3).* These stresses impact trade flows leading to rising trade costs and increased inflationary pressures on energy and commodity prices globally that combined, further worsen the food security situation in the region.

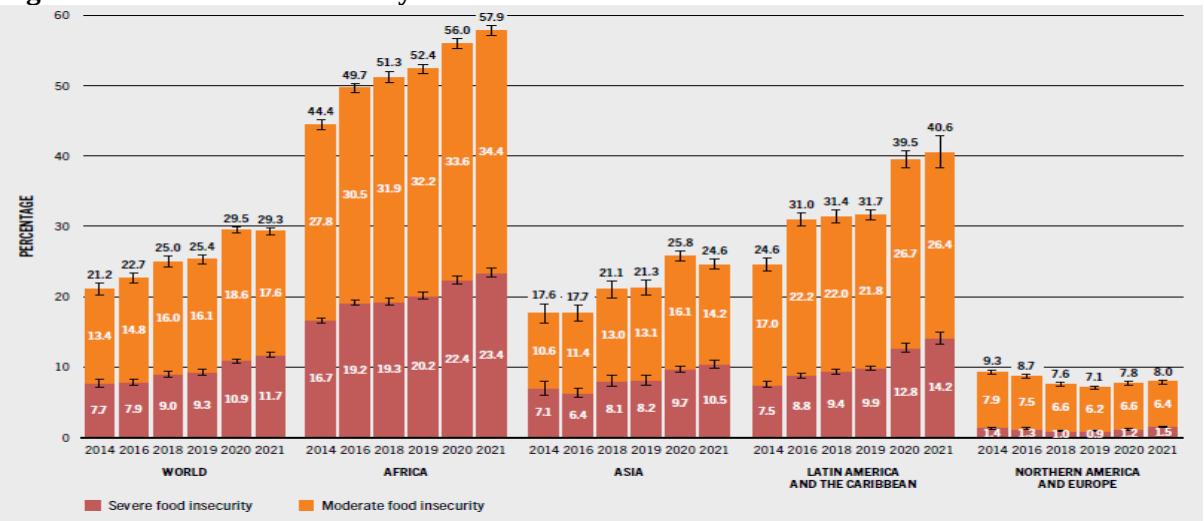
Table 2: Food Insecurity Levels by Region 2014-2021 (%)

	Prevalence of Severe Food Insecurity (%)				Prevalence of Moderate or Severe Food Insecurity (%)			
	2014-2016	2017-2019	2018-2020	2019-2021	2014-2016	2017-2019	2018-2020	2019-2021
World	**7.7**	**8.9**	**9.7**	**10.7**	**21.8**	**24.8**	**26.6**	**28.1**
Africa	**17.7**	**19.8**	**20.7**	**22**	**46.5**	**51.7**	**53.3**	**55.5**
Burundi	-	-	-	-	-	-	-	-
DRC	-	-	38.5	39.2	-	-	69.2	72.3
Kenya	15	23.4	24.9	26.1	50.7	64.4	67.7	69.5
Rwanda	-	-	-	-	-	-	-	-
Tanzania	-	63.7	63	62.3		84.9	85.7	86.4
Uganda	20.6	25	24.4	25.8	48.8	56.1	56.3	57.6
Asia	6.7	7.6	8.7	9.5	17.6	20.4	22.7	23.9
Latin America & the Caribbean	7.9	9.7	10.7	12.3	27.6	32	34.2	37.3
North America	1.3	1	1	1.2	9.1	7.7	7.5	7.6
Oceania	2.8	3.9	3.4	3.7	11.1	13.7	12.9	12.9

Source: FAO 2023. World Food and Agriculture Statistical Yearbook 2022

The prevalence of moderate or severe food insecurity at the global level has been increasing since 2014 *(Figure 3 and Table 2).* In 2020, at the onset of the COVID-19 pandemic, levels rose nearly as much as in the previous five years combined. It is estimated that moderate or severe food insecurity levels will remain unchanged in 2021, however severe food insecurity will increase, giving further evidence of a deteriorating situation to populations already experiencing serious hardships (FAO 2022).

Figure 3: Global Food Insecurity



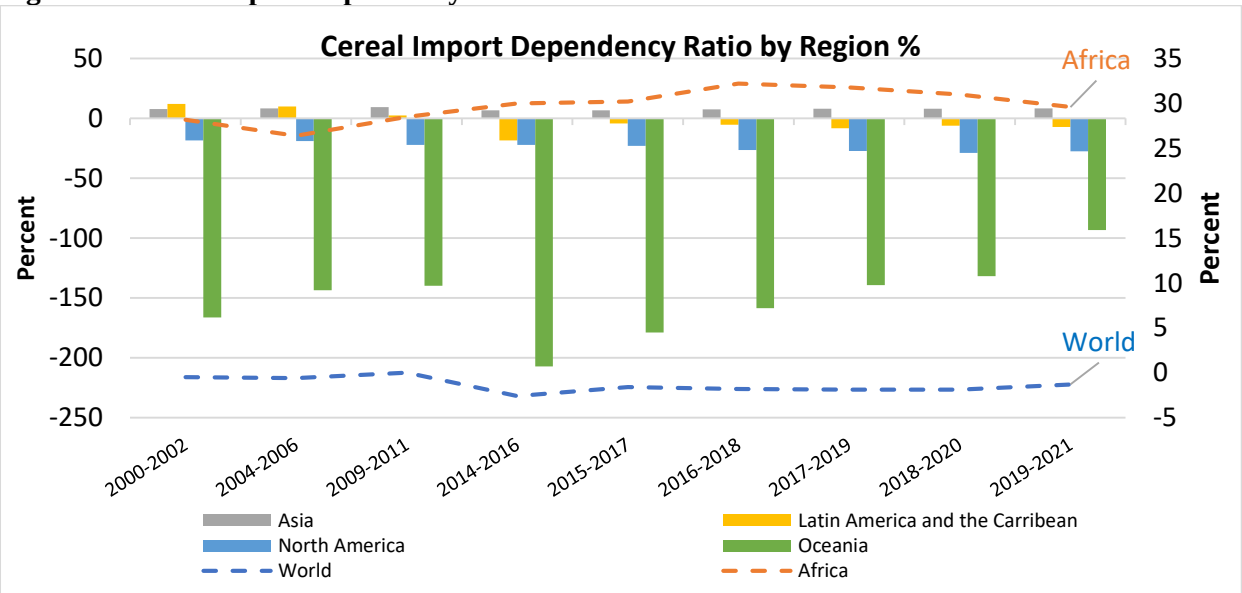
Source: FAO 2023. The State of Food Security and Nutrition in the World 2022

3.1.2 Cereal import dependency ratio

Given the importance of cereals as staple foods worldwide and the discrepancy between consumption and production in many countries, a key measure of food security is the cereals imports dependency ratio. This indicator reveals how much of a country's domestic food supply of cereals is imported and how much is from the country's own domestic production. The higher the dependency ratio, the more dependent a country is on cereal imports. Negative values on the other hand indicate a country or region is a net exporter of cereals.

Globally Asia, Africa, and Latin America remain the top dependent regions indicative that domestic production is not sufficient to meet demand, while Oceania, North America, Latin America, and the Caribbean are net exporters of cereals *(Figure 4)*.

Figure 4: Cereal Import Dependency Ratio



Source: FAO 2023. World Food and Agriculture Statistical Yearbook 2022

3.2 Impact of COVID-19 on food insecurity

(1) Prevalence of Undernourishment

The uneven economic recovery following the COVID-19 pandemic combined with the slow global economic growth weighed down by the war in Ukraine have continued to affect food security contributing to further setbacks towards achieving the 2030 Zero Hunger target. Globally, world hunger increased in 2021 driven by the effects of the pandemic which drove further existing inequalities and associated cost-of-living crisis in many countries increasing the number of people facing hunger in the world from 618.4 million in 2019 to 767.9 Million in 2021 *(Table 3)*.

Table 3: Prevalence of Undernourishment (PoU), 2005 – 2021

	Number of undernourished people (millions)								
	2005	2010	2015	2016	2017	2018	2019	2020*	2021*
WORLD	**805.5**	**601.3**	**588.6**	**585.1**	**573.3**	**590.6**	**618.4**	**721.7**	**767.9**
AFRICA	**189.9**	**171.0**	**187.4**	**198.0**	**203.5**	**216.8**	**227.5**	**262.8**	**278.0**
Northern Africa	15.6	13.0	11.6	12.2	13.1	13.1	13.1	14.6	17.4
Sub-Saharan Africa	174.3	158.0	175.8	185.8	190.4	203.7	214.4	248.2	260.6
Eastern Africa	99.8	89.9	95.2	100.9	104.6	112.3	119.3	134.4	136.4
Middle Africa	39.1	34.2	40.6	43.6	43.6	46.2	48.9	54.7	60.7
Southern Africa	2.7	3.4	4.7	4.8	4.8	4.9	5.3	6.2	6.3
Western Africa	32.6	30.5	35.4	36.5	37.3	40.3	40.8	53.0	57.3
ASIA	**552.5**	**381.5**	**356.4**	**336.2**	**320.8**	**323.1**	**339.9**	**398.2**	**424.5**
Central Asia	8.2	3.7	2.6	2.5	2.3	2.1	1.9	2.3	2.3
Eastern Asia	106.0	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
South-eastern Asia	96.6	65.3	49.4	43.3	39.1	38.8	36.9	38.6	42.8
Southern Asia	325.7	262.3	258.0	242.1	232.8	233.3	254.1	307.6	331.6
Western Asia	16.0	13.7	24.8	27.4	27.3	27.9	27.5	28.3	28.4
Western Asia and Northern Africa	*31.7*	*26.6*	*36.4*	*39.6*	*40.4*	*41.0*	*40.6*	*42.9*	*45.8*
LATIN AMERICA AND THE CARIBBEAN	**51.7**	**39.1**	**35.9**	**42.5**	**40.7**	**42.5**	**43.3**	**52.3**	**56.5**
Caribbean	7.4	6.3	6.1	6.2	6.2	6.6	6.6	7.2	7.2
Latin America	44.3	32.9	29.9	36.3	34.6	36.0	36.7	45.1	49.4
Central America	11.7	11.4	12.7	13.9	13.7	13.9	13.6	14.4	15.2
South America	32.7	21.4	17.2	22.4	20.9	22.1	23.2	30.7	34.2
OCEANIA	**2.3**	**2.3**	**2.3**	**2.3**	**2.4**	**2.4**	**2.3**	**2.3**	**2.5**
NORTHERN AMERICA AND EUROPE	**n.r.**	**n.r.**	**n.r.**	**n.r.**	**n.r.**	**n.r.**	**n.r.**	**n.r.**	**n.r.**

Source: FAO 2023. The State of Food Security and Nutrition in the World 2022

The situation is severe in Africa where 35 million more people were affected by hunger in 2020 from 2019 prior to the COVID-19 pandemic, with a further 15 million in 2021. This increase of 50 million more people in two years represents an increase of more than 2 percentage points from 2019 to 2020 under the shadow of the COVID-19 pandemic, and 0.6 percentage increase from 2020 to 2021 *(Table 4)*.

Table 4: Prevalence of Undernourishment (PoU) %, 2005 - 2021

	Prevalence of undernourishment (percent)								
	2005	2010	2015	2016	2017	2018	2019	2020*	2021*
WORLD	**12.3**	**8.6**	**8.0**	**7.8**	**7.6**	**7.7**	**8.0**	**9.3**	**9.8**
AFRICA	**20.7**	**16.5**	**15.8**	**16.3**	**16.4**	**17.0**	**17.4**	**19.6**	**20.2**
Northern Africa	8.4	6.4	5.2	5.4	5.6	5.5	5.4	5.9	6.9
Sub-Saharan Africa	23.9	18.9	18.3	18.9	18.8	19.6	20.1	22.7	23.2
Eastern Africa	33.8	26.5	24.4	25.2	25.4	26.6	27.5	30.2	29.8
Middle Africa	34.9	26.0	26.3	27.4	26.6	27.3	28.1	30.4	32.8
Southern Africa	4.9	5.8	7.4	7.4	7.5	7.4	7.9	9.1	9.2
Western Africa	12.2	9.9	10.1	10.1	10.0	10.6	10.4	13.2	13.9
ASIA	**13.9**	**9.1**	**8.0**	**7.5**	**7.1**	**7.1**	**7.4**	**8.6**	**9.1**
Central Asia	14.0	6.0	3.8	3.5	3.2	2.9	2.6	3.1	3.1
Eastern Asia	6.8	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
South-eastern Asia	17.2	10.9	7.8	6.7	6.0	5.9	5.6	5.8	6.3
Southern Asia	20.5	15.3	14.1	13.1	12.4	12.3	13.2	15.9	16.9
Western Asia	7.8	5.9	9.6	10.4	10.2	10.3	10.0	10.1	10.0
Western Asia and Northern Africa	*8.1*	*6.1*	*7.6*	*8.1*	*8.1*	*8.1*	*7.9*	*8.2*	*8.6*
LATIN AMERICA AND THE CARIBBEAN	**9.3**	**6.6**	**5.8**	**6.7**	**6.4**	**6.6**	**6.7**	**8.0**	**8.6**
Caribbean	18.7	15.2	14.2	14.5	14.4	15.2	15.2	16.5	16.4
Latin America	8.6	6.0	5.1	6.2	5.8	6.0	6.1	7.4	8.0
Central America	8.0	7.3	7.5	8.1	7.9	7.9	7.6	8.0	8.4
South America	8.8	5.5	4.2	5.4	5.0	5.2	5.4	7.1	7.9
OCEANIA	**6.8**	**6.2**	**5.7**	**5.8**	**5.8**	**5.7**	**5.6**	**5.4**	**5.8**
NORTHERN AMERICA AND EUROPE	**<2.5**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	**<2.5**	**<2.5**

Source: FAO 2023. The State of Food Security and Nutrition in the World 2022

Globally, regional patterns showing disparities continue to exist, with Africa bearing the heaviest burden. In 2021 one in five people in Africa (20.2% of the population) was facing hunger, compared to 9.1% in Asia, 8.6% in Latin America and the Caribbean, 5.8% in Oceania, and less than 2.5% in Northern America and Europe *(Table 4)*. Africa is also the region where the proportion of the population affected by hunger has increased the most (FAO, 2022).

3.3 Impact of Climate Change on Global Food Security

Climate change is intensifying food insecurity across SSA with lasting adverse macroeconomic effects, especially on economic growth and poverty. Successive shocks from Russia's war in Ukraine and the COVID-19 pandemic have increased food insecurity in SSA by at least 30 percent since early 2020 (International Monetary Fund (IMF), 2022).

The increasing regularity and intensity of extreme weather events *(Box 1)* such as droughts and floods continue to affect agricultural yields/ production and foods distribution especially in SSA. Currently, in Eastern Africa, Kenya and Ethiopia are experiencing one of the most severe droughts in recent history.

Box. 1: Climate Change and SSA's Intensified Food Security

Climate Change in SSA

- A one degree Celsius temperature increase in developing countries is associated with a 3 percentage point reduction in agricultural output, leading to a 1.3 percentage point decline in growth.7 In SSA, crop yields are projected to decline by 5 to 17 percent by 2050, especially in key staples.8 Notably, rising temperatures and rainfall volatility are key contributors to the shrinking of growing seasons and arable land, resulting in reduced productivity from overuse—impeding total factor productivity in agriculture.

- Rising temperatures and water levels are causing insects and weed seeds to migrate into SSA.10 The 2019–20 locust infestations in Ethiopia, Kenya, and Somalia affected 1.25 million hectares of land, and the infestation response increased the region's financing needs by about $70 million.

- Ocean acidification and rising temperatures are shrinking ecosystems, resulting in shortages of fish, meat, and dairy through diminished fishing yields, livestock grazing areas, animal lifespans, and impaired embryonic development and reproductive efficiency. The current drought in the Horn of Africa has already killed more than 1.5 million livestock and drastically cut cereal production.13 By 2050, fish production in Coastal West Africa is projected to decline by 21 percent with a 50 percent decline in fisheries-related jobs; and it is expected to decline in Lake Tanganyika by almost 30 percent with adverse consequences across East Africa (Burundi, Democratic Republic of Congo, Tanzania, and Zambia).

- Rising temperatures, CO2 emissions, and toxin levels disrupt grain development resulting in low protein content.16 For example, based on actual outcomes during varied growing seasons, it has been found that the edible portions of key staples (for example, wheat, rice, potato) decrease by 10 to 14 percent.

Source: IMF Climate Change and Chronic Food Insecurity in SSA 2022

Climate change also poses macro-economic effects due to food and agricultural input shortages resulting in higher food prices. Net food importing countries are particularly sensitive to fluctuations in energy and commodity prices as well as transport/ freight costs. These increasing prices translate into higher inflation affecting populations purchasing power worsening inequalities *(details in Chapter 5).*

3.4 Global Hunger Situation

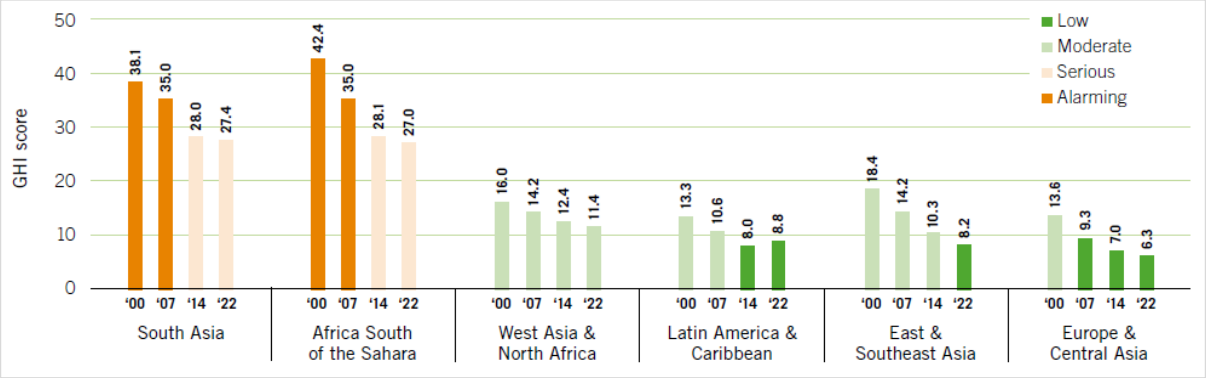
3.4.1 Global Hunger Index

The Global Hunger Index (GHI)[3], is a tool for tracking hunger at global, regional, and national levels. In 2022 the GHI shows that the global hunger situation is serious. The combination of various crises around the globe is exposing the fragility of food systems emphasizing the vulnerability to hunger by populations around the world.

GHI Severity of Hunger Scale
Low GHI ≤ 9.9
Moderate GHI 10.0 - 19.9
Serious GHI 20.0 - 34.9
Alarming GHI 35.0 - 49.9
Extremely alarming GHI ≥ 50.0

Progress against hunger reduction has been minimal during the period 2014 to 2022, after decades of gradual progress, at 18.2 in 2022, a slight decline from the 2014 score of 19.1. Regionally Africa, and South Asia continue to be the region's leading with the highest hunger levels as well as being the most vulnerable to current and future global shocks *(Figure 5)*.

Figure 5: Regional 2000, 2007, 2014, and 2022 Global Hunger Index Scores



Source: Global Hunger Index Report 2022

The global hunger situation is projected to worsen, despite the steady decline over the years (*figure 6*), as conflict, climate change, and the post-pandemic economic impact of the COVID-19 pandemic continue to drive hunger levels higher, by collectively undermining food security and nutrition around the world. Furthermore, the war in Ukraine has had an upward inflationary effect on global food, fuel, and commodity prices further exerting pressure on the already vulnerable global food system. These crises together with underlying factors such as inequality, poverty, low agricultural productivity and poor infrastructure essentially render food systems globally and, in many countries, inadequate at tackling and eliminating hunger.

[3] The GHI score is based on the values of four component indicators namely: undernourishment, child stunting, child wasting and child mortality.

Figure 6: 2000, 2007, 2014 and 2022 Global Hunger Index Scores, and change since 2014.

2000, 2007, 2014, AND 2022 GLOBAL HUNGER INDEX SCORES, AND CHANGE SINCE 2014

Country with data from	2000 '98–'02	2007 '05–'09	2014 '12–'16	2022 '17–'21	Absolute change since 2014	% change since 2014
Afghanistan	50.3	38.7	30.6	29.9	-0.7	-2.3
Albania	20.7	15.8	9.2	6.2	-3.0	-32.6
Algeria	14.5	11.4	8.7	6.9	-1.8	-20.7
Angola	64.9	44.7	26.2	25.9	-0.3	-1.1
Argentina	6.6	5.5	5.0	6.8	1.8	36.0
Armenia	19.3	12.1	7.3	6.9	-0.4	-5.5
Azerbaijan	24.9	15.3	9.3	7.5	-1.8	-19.4
Bahrain	—	—	—	—	—	—
Bangladesh	33.9	31.3	26.3	19.6	-6.7	-25.5
Belarus	<5	<5	<5	<5	—	—
Benin	33.8	26.9	23.2	21.7	-1.5	-6.5
Bhutan	—	—	—	—	—	—
Bolivia (Plurinat. State of)	27.7	22.0	14.7	13.2	-1.5	-10.2
Bosnia & Herzegovina	9.3	6.6	<5	<5	—	—
Botswana	27.7	25.8	20.5	20.0	-0.5	-2.4
Brazil	11.4	7.1	5.0	5.4	0.4	8.0
Bulgaria	8.6	7.9	7.4	5.9	-1.5	-20.3
Burkina Faso	44.9	34.5	26.5	24.5	-2.0	-7.5
Burundi	—	—	—	—	—	—
Cabo Verde	15.3	11.9	12.1	11.8	-0.3	-2.5
Cambodia	41.1	26.1	20.1	17.1	-3.0	-14.9
Cameroon	35.8	29.9	21.4	18.9	-2.5	-11.7
Central African Republic	48.8	46.8	44.6	44.0	-0.6	-1.3
Chad	50.7	49.0	40.7	37.2	-3.5	-8.6
Chile	<5	<5	<5	<5	—	—
China	13.3	7.8	<5	<5	—	—
Colombia	10.9	11.2	8.6	7.6	-1.0	-11.6
Comoros	39.5	31.7	29.1	26.9	-2.2	-7.6
Congo (Republic of)	34.7	33.7	25.3	28.1	2.8	11.1
Costa Rica	7.0	<5	<5	5.3	—	—
Côte d'Ivoire	33.4	35.8	22.7	16.8	-5.9	-26.0
Croatia	<5	<5	<5	<5	—	—
Dem. Rep. of the Congo	48.0	43.2	38.7	37.8	-0.9	-2.3
Djibouti	44.3	35.8	27.4	21.5	-5.9	-21.5
Dominican Republic	15.0	13.9	9.8	8.8	-1.0	-10.2
Ecuador	19.7	18.6	11.7	15.2	3.5	29.9
Egypt	16.3	17.2	14.6	12.3	-2.3	-15.8
El Salvador	14.7	12.1	10.4	8.4	-2.0	-19.2
Equatorial Guinea	—	—	—	—	—	—
Eritrea	—	—	—	—	—	—
Estonia	<5	<5	<5	<5	—	—
Eswatini	24.7	22.9	18.4	16.3	-2.1	-11.4
Ethiopia	53.6	42.6	27.4	27.6	0.2	0.7
Fiji	9.5	8.5	9.3	9.2	-0.1	-1.1
Gabon	20.9	20.3	16.5	17.2	0.7	4.2
Gambia	29.0	26.5	22.2	20.7	-1.5	-6.8
Georgia	12.3	7.8	6.1	5.7	-0.4	-6.6
Ghana	28.5	22.1	15.5	13.9	-1.6	-10.3
Guatemala	28.4	24.1	21.7	18.8	-2.9	-13.4
Guinea	—	—	—	—	—	—
Guinea-Bissau	37.7	31.0	30.2	30.8	0.6	2.0
Guyana	17.1	15.8	12.4	10.4	-2.0	-16.1
Haiti	40.9	41.7	32.6	32.7	0.1	0.3
Honduras	21.8	19.2	14.1	13.4	-0.7	-5.0
Hungary	5.5	<5	<5	<5	—	—
India	38.8	36.3	28.2	29.1	0.9	3.2
Indonesia	26.1	29.1	22.2	17.9	-4.3	-19.4
Iran (Islamic Republic of)	13.7	8.8	7.4	6.5	-0.9	-12.2
Iraq	23.8	20.8	16.6	13.7	-2.9	-17.5
Jamaica	8.6	8.1	8.8	7.0	-1.8	-20.5
Jordan	10.8	7.5	7.4	10.6	3.2	43.2
Kazakhstan	11.2	11.6	5.8	5.9	0.1	1.7
Kenya	36.6	31.1	21.6	23.5	1.9	8.8
Korea (DPR)	39.5	29.6	27.5	24.9	-2.6	-9.5
Kuwait	<5	<5	<5	<5	—	—
Kyrgyzstan	18.0	13.6	9.4	7.8	-1.6	-17.0
Lao PDR	44.2	31.4	22.5	19.2	-3.3	-14.7
Latvia	5.6	<5	<5	<5	—	—
Lebanon	11.6	11.2	8.7	10.5	1.8	20.7
Lesotho	32.7	29.1	29.3	32.4	3.1	10.6
Liberia	48.2	39.0	34.8	32.4	-2.4	-6.9
Libya	—	—	—	—	—	—
Lithuania	5.4	<5	<5	<5	—	—
Madagascar	42.5	37.2	37.3	38.7	1.4	3.8
Malawi	43.3	32.5	24.1	20.7	-3.4	-14.1
Malaysia	15.4	13.8	10.9	12.5	1.6	14.7
Maldives	—	—	—	—	—	—
Mali	41.7	35.7	26.1	23.2	-2.9	-11.1
Mauritania	31.8	28.3	26.3	20.7	-5.6	-21.3
Mauritius	15.3	14.1	13.0	13.4	0.4	3.1
Mexico	10.2	8.5	7.0	8.1	1.1	15.7
Moldova (Rep. of)	18.7	20.3	6.8	6.9	0.1	1.5
Mongolia	30.0	21.8	9.2	5.7	-3.5	-38.0
Montenegro	—	5.4	<5	<5	—	—
Morocco	15.8	12.4	9.6	9.2	-0.4	-4.2
Mozambique	—	—	—	—	—	—
Myanmar	39.9	29.4	17.9	15.6	-2.3	-12.8
Namibia	25.4	26.8	22.9	18.7	-4.2	-18.3
Nepal	37.0	30.0	21.2	19.1	-2.1	-9.9
Nicaragua	22.4	17.9	15.5	13.6	-1.9	-12.3
Niger	52.5	40.2	32.8	32.6	-0.2	-0.6
Nigeria	40.4	32.1	28.4	27.3	-1.1	-3.9
North Macedonia	7.5	7.2	<5	<5	—	—
Oman	14.7	11.5	11.5	13.0	1.5	13.0
Pakistan	36.8	32.1	29.6	26.1	-3.5	-11.8
Panama	18.6	14.0	9.4	8.1	-1.3	-13.8
Papua New Guinea	33.6	29.9	29.0	26.5	-2.5	-8.6
Paraguay	11.6	11.4	8.1	8.0	-0.1	-1.2
Peru	20.6	15.0	7.6	7.6	0.0	0.0
Philippines	25.0	19.5	18.8	14.8	-4.0	-21.3
Qatar	—	—	—	—	—	—
Romania	7.9	5.8	5.1	<5	—	—
Russian Federation	10.1	7.1	6.7	6.4	-0.3	-4.5
Rwanda	49.9	35.9	29.5	27.2	-2.3	-7.8
Saudi Arabia	11.0	12.2	7.4	6.7	-0.7	-9.5
Senegal	34.2	22.8	17.6	15.6	-2.0	-11.4
Serbia	—	6.1	5.8	<5	—	—
Sierra Leone	57.5	51.1	33.1	31.5	-1.6	-4.8
Slovakia	7.0	5.9	5.7	<5	—	—
Solomon Islands	20.1	18.1	22.3	19.4	-2.9	-13.0
Somalia	—	—	—	—	—	—
South Africa	18.1	17.2	12.7	12.9	0.2	1.6
South Sudan	—	—	—	—	—	—
Sri Lanka	21.7	18.9	17.3	13.6	-3.7	-21.4
Sudan	—	—	29.3	28.8	-0.5	-1.7
Suriname	15.1	11.3	10.0	10.2	0.2	2.0
Syrian Arab Republic	—	—	—	—	—	—
Tajikistan	40.3	32.9	20.6	13.9	-6.7	-32.5
Tanzania (United Rep. of)	40.8	30.9	25.5	23.6	-1.9	-7.5
Thailand	18.6	12.1	11.9	12.0	0.1	0.8
Timor-Leste	—	45.5	33.3	30.6	-2.7	-8.1
Togo	39.3	30.2	26.1	22.8	-3.3	-12.6
Trinidad & Tobago	11.0	10.7	8.8	9.0	0.2	2.3
Tunisia	10.3	7.6	6.7	6.1	-0.6	-9.0
Türkiye	10.1	5.8	<5	<5	—	—
Turkmenistan	20.4	14.6	10.6	9.5	-1.1	-10.4
Uganda	—	—	—	—	—	—
Ukraine	13.0	7.2	7.2	7.5	0.3	4.2
United Arab Emirates	6.2	6.5	5.9	5.3	-0.6	-10.2
Uruguay	7.4	6.5	<5	<5	—	—
Uzbekistan	24.2	15.4	8.3	5.6	-2.7	-32.5
Venezuela (Boliv. Rep. of)	14.6	10.1	8.1	19.9	11.8	145.7
Viet Nam	26.3	21.4	15.4	11.9	-3.5	-22.7
Yemen	41.3	38.4	41.7	45.1	3.4	8.2
Zambia	53.3	46.0	35.2	29.3	-5.9	-16.8
Zimbabwe	—	—	—	—	—	—

Note: — = Data are not available or not presented. See Table A.3 for provisional designations of the severity of hunger for some countries with incomplete data. Some countries did not exist in their present borders in the given year or reference period. = low = moderate = serious = alarming = extremely alarming

Source: Global Hunger Index Report, 2022

3.4.2 Prevalence of Food Insecure Households

Food insecurity varies by country and region, and over time. The percentage of people in households that have experienced food insecurity has been on a steady rise over time, with the biggest increase in the 2019-2021 period. Africa leads in food insecurity with more than a fifth of its population being victims, which is twice as high as the world average. On the other hand, North America and Oceania are regions that have less than 5% of severe insecure households. This is shown in *Table 5* below.

Table 5: Comparison of food insecurity globally, %

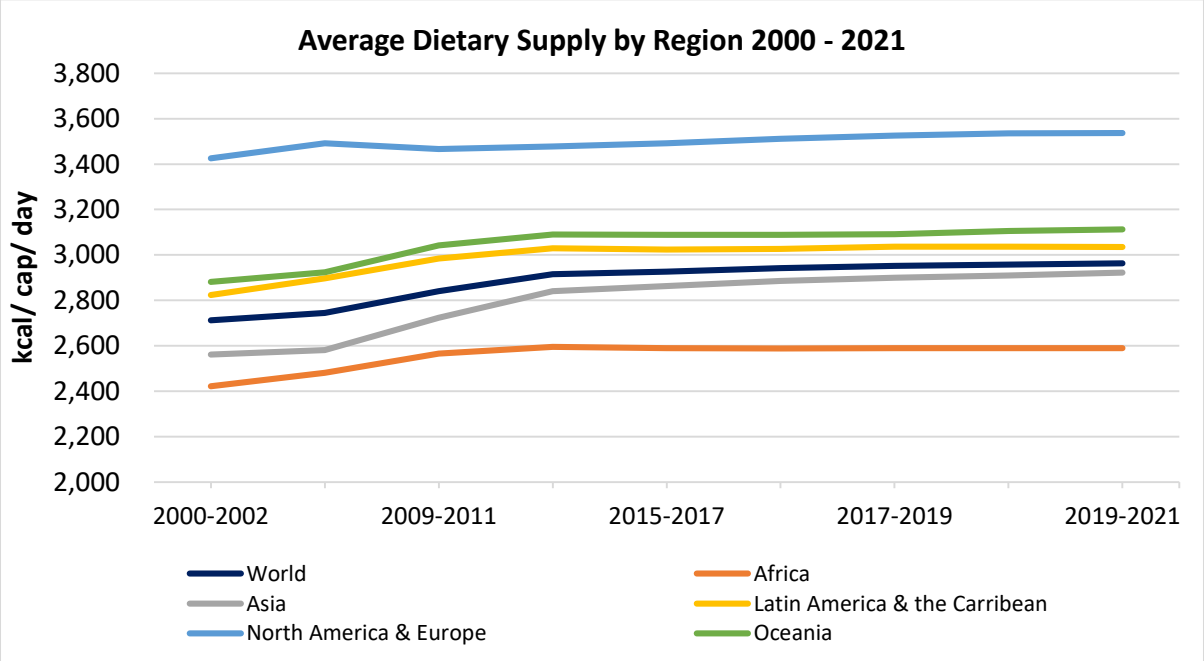
Country	Prevalence of Severe Food Insecurity			
	2014-2016	2017-2019	2018-2020	2019-2021
World	7.7	8.9	9.7	10.7
Africa	17.7	19.8	20.7	22
Asia	6.7	7.6	8.7	9.5
Latin America and the Caribbean	7.9	9.7	10.7	12.3
North America	1.3	1	1	1.2
Oceania	2.8	3.9	3.4	3.7

Source: FAO 2023. The State of Food Security and Nutrition in the World 2022

3.5 Depth of Food Supply

As the global production and crop yields continue to increase, the supply of food has also increased, the world average dietary energy supply (DES), measured as calories per capita per day, has been increasing steadily to around 2 960 kcal per person per day over the period from 2019 to 2021, up 9 percent compared with 2000 to 2002 *(Figure 7)*

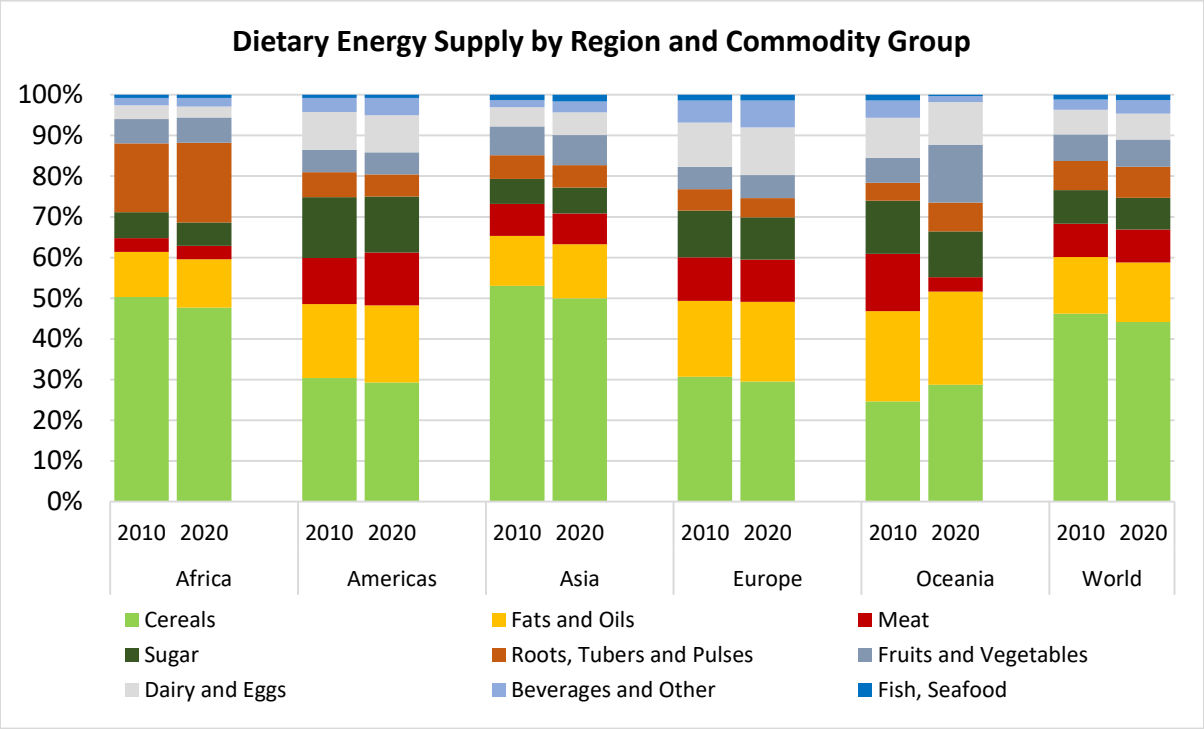
Figure 7: Average Dietary Energy Supply (DES) by Region 2000 - 2021



Source: FAO. 2023. FAOSTAT: Suite of Food Security Indicators

Globally, in the composition of dietary energy supply, cereals were the most important contributor to the dietary energy supply; with fats and oils the second major food group in all regions except for Africa where roots, tubers and pulses were the second major food group *(Figure 8)*.

Figure 8: Dietary Energy Supply by Region and Commodity Group (2010 & 2020)



Source: FAO. 2023. FAOSTAT: Food Balances

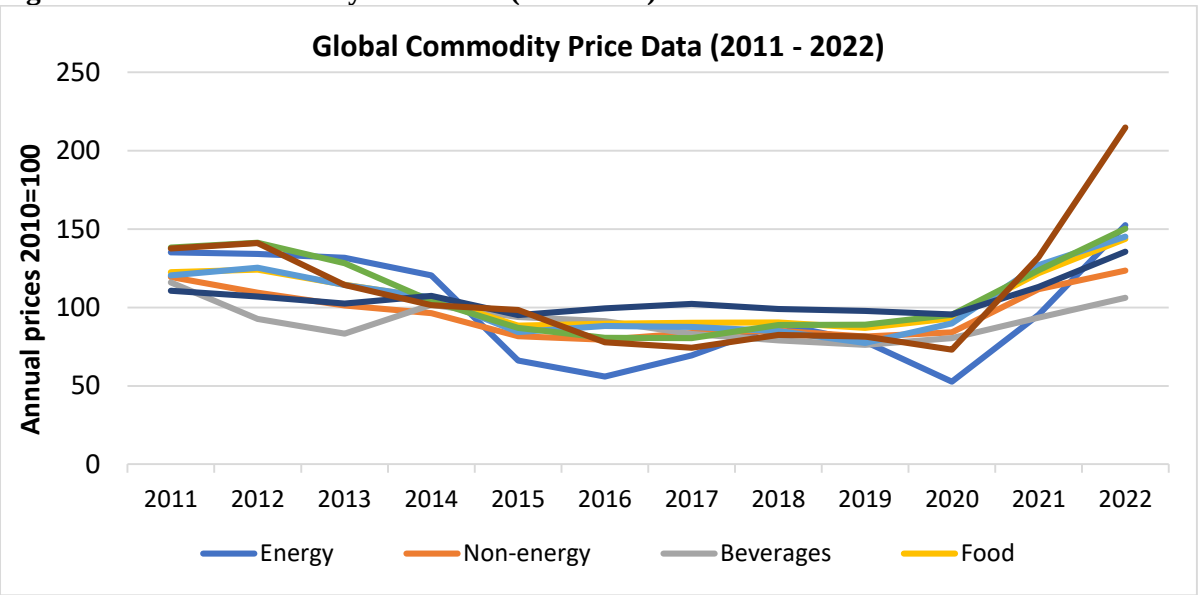
3.5.1 Trends in prices for global food products

Commodity Price Indices

The world is currently facing a global price crisis coupled with high inflation with commodity prices at record highs. In the past three years, major global shocks namely climate change, pandemics and conflicts have combined to pose serious risks to global food security. Prior to the war in Ukraine increased demand driven by the global economic recovery from the COVID-19 pandemic effects was already exerting pressure in the form of pushing up food and commodity prices in the world market. The war in Ukraine has further pushed prices even higher aggravating supply chains, raised trade and freight costs, and restricted trade flows through supply restrictions.

The costs of energy, and commodity prices have surged since the Ukraine conflict started, triggering price increases in 2022 of up to 49% energy, 39% food, and 62% fertilizer from 2019 levels *(Figure 9)*. Higher prices for agricultural inputs such as fertilizer and fuel are being felt on the global markets through higher transport costs, logistical hurdles and disruption of supply chains, with the ongoing conflict in Ukraine having a negative effect on affordability and on supply chain infrastructure.

Figure 9: Global Commodity Price Data (2011-2022)



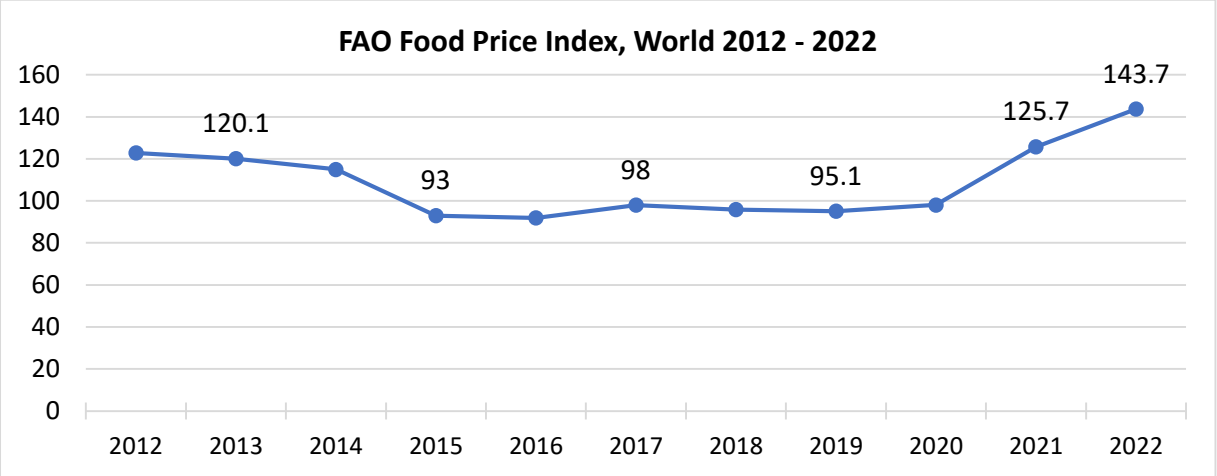
Source: World Bank Commodity Price Data (Nominal 2010=100)

As commodity prices continue rising especially for inputs such as fertilizers and energy from fossil fuels, these in turn exert pressure on world food prices with negative effects on global food security. This surge in food prices is reflected in the Food Price Index (FPI) which reached its highest recorded level in 2022 since the year 1990.

3.5.2 Food Price Index

The FAO Food Price Index declined during the early phase of the COVID-19 pandemic reflecting uncertainties faced by commodity markets due to disruptions in supply and trade as well as export restrictions. However, the FPI surged to 143.7 points in 2022 *(Figure 10)*, due to a combination of factors including; the effects of the COVID-19 pandemic on the supply chains; the post-pandemic rebound in activity and demand experienced in 2021; and lastly, the disruption to exports of cereals and vegetable oils from the Russian Federation and Ukraine due to conflict.

Figure 10: FAO Food Price Index, World (2012 - 2022)



Source: FAO 2023. FAOSTAT: Prices

Table 6: FAO Food Price Indices, Monthly (2022 - 2023)

Year	Month	Food Price Index	Meat	Dairy	Cereals	Vegetables Oils	Sugar
2022	January	135.6	112.1	132.6	140.6	185.9	112.7
	February	141.2	113.9	141.5	145.3	201.7	110.5
	March	159.7	119.3	145.8	170.1	251.8	117.9
	April	158.4	121.9	146.7	169.7	237.5	121.5
	May	158.1	122.9	144.2	173.5	229.2	120.4
	June	154.7	125.9	150.2	166.3	211.8	117.3
	July	140.6	124.1	146.5	147.3	168.8	112.8
	August	137.6	121.1	143.4	145.6	163.3	110.5
	September	136.0	120.3	142.7	147.9	152.6	109.7
	October	135.4	116.8	139.3	152.3	151.3	108.6
	November	134.7	114.6	137.4	150.1	154.7	114.4
	December	132.2	113.7	138.2	147.3	144.6	117.2
2023	January	131.1	113.6	136.2	147.4	140.4	115.8

Source: FAO 2023. FAOSTAT: Prices

The FFPI index shows that the index in food dropped gradually from the high levels of 159.7 in March 2022, its highest value ever, to 132.2 points in December 2022, which is lower than the pre-war index value levels of 135.6 in January the same year *(Table 6)*.

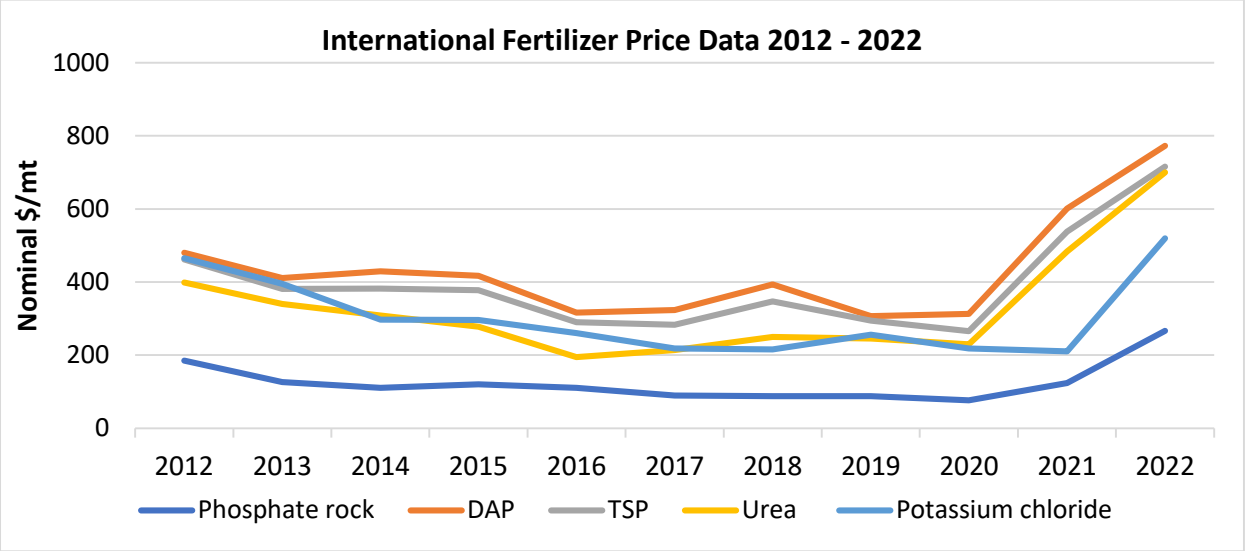
3.5.3 Trends of input costs, trade patterns and availability

The slow growth and uneven economic recovery post-pandemic combined with the war in Ukraine have had devastating effects on food security and nutrition globally. The frequency and intensity of global shocks in the form of conflicts, climate variability and weather extremes, economic slowdowns, are exerting pressure on world markets increasing prices for agricultural inputs, energy and fuel, trade and transportation costs, and creating logistical hurdles through supply chain disruptions (FAO, WTO, 2022)

Fertilizer

As fertilizer use increases globally *(Figure 11)*, the war in Ukraine has posed risks in the terms of reduced fertilizer availability and access which have adverse effects on food production and food security. These pressures on prices of agricultural products and fertilizers are significant given the Russian Federation and Ukraine are among the most important producers of agricultural products. Russia, especially, is a key energy player and the world's largest fertilizer exporter (FAO, WTO, 2022).

Figure 11: International Fertilizer Prices by Commodity 2012 – 2022 (USD/mt)



Source: World Bank 2023. World Bank Commodity Price Data (Nominal 2010=100)

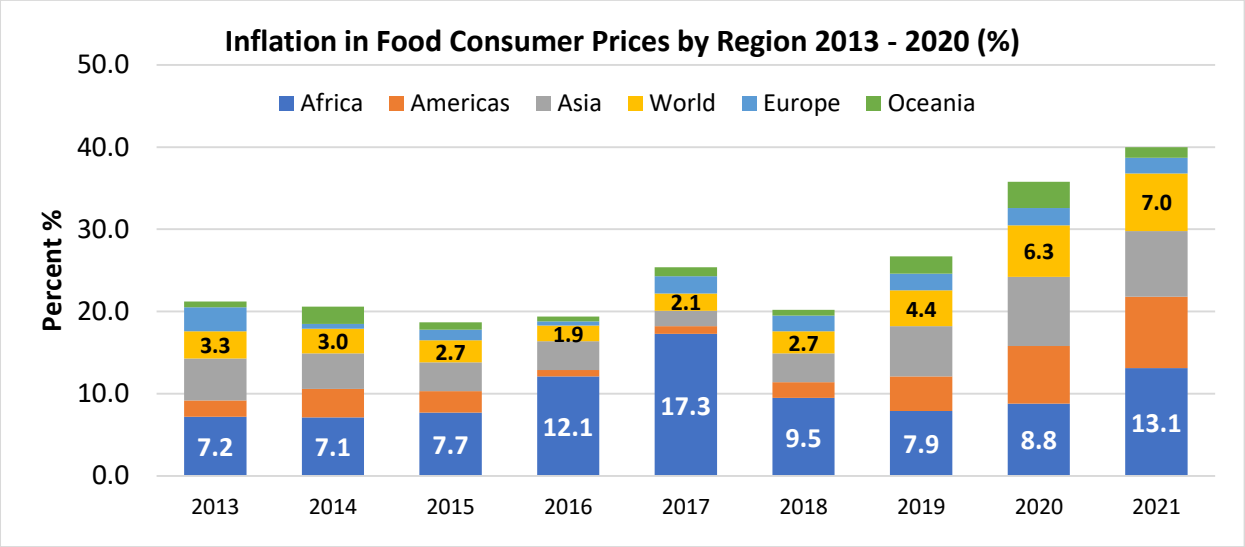
As in all commodity markets, fertilizer prices are determined by the interplay of supply and demand. On the supply side, (i) high and volatile energy prices, (ii) disruptions in trade and high transportation costs, and (iii) export restrictions; while on the demand side, (iv) subsidies and (v) high crop prices and hence high affordability (FAO, IFAD, UNICEF, WFP, and WHO, 2022).

3.6 Global Food Price Inflation

Consumer Prices

Consumer prices continued to rise to record levels with the onset of the COVID-19 pandemic in 2020, impacting the food security of countries *(Figure 12)*. Prices are expected to remain above pre-pandemic levels due to increasing energy and fertilizer prices brought about by the war in Ukraine. The high domestic prices are reflected in the high operating inflation rates.

Figure 12: Inflation in Food Consumer Prices by region 2013-2020 (%)



Source: FAO 2023. FAOSTAT: Prices

3.7 Stakeholder views

Most of the stakeholders highlighted the effects of global crises on food prices, with a general view that they were negatively impacting. In particular, countries that are net food importers, (all Partner States) in the form of cereals and edible oils, experienced inflation across all sectors. Moreover, transport costs arising from higher fuel prices and logistical challenges from lockdowns as part of COVID 19 containment measures exacerbated food prices. The food prices were exacerbated with the onset of the Ukraine-Russia war. In addition, climate change challenges overtime has impacted negatively on food security.

PART III: IMPACT OF GLOBAL CRISES - ON FOOD SECURITY IN THE EAC REGION

4.0 FOOD SECURITY IN THE EAC REGION

4.1 Food Security Status in the EAC amidst global rankings

Prior to the Covid-19 pandemic, only Kenya had a score of above average followed closely by Rwanda and Uganda. At the height of the pandemic in 2020, only Burundi and DRC improved their scores with 37 and 40.7 respectively (*table 7*). Consistent improvement over Uganda, Rwanda, and Tanzania could mean quick adaptability to the pandemic, as can be seen from their 2021 scores improving through to 2022. Unfortunately, not much can be said about South Sudan since it is not among the countries considered for ranking.

Table 7: GFSI Scores of East African countries, 2019-2022

	Country	GFSI Scores							
		2019		2020		2021		2022	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank
	EAC								
1	Burundi	34.3	112	37.1	107	34.7	113	40.6	108
2	Democratic Republic of Congo	35.7	110	40.7	98	39.1	103	43	104
3	Kenya	50.7	86	49	86	46.8	90	53	82
4	Rwanda	48.2	95	38.8	104	40.3	101	50.6	88
5	South Sudan	NA	NA	NA	NA	NA	NA	NA	NA
6	Uganda	46.2	98	42.9	95	43.9	95	47.4	93
7	Tanzania	47.6	96	47.1	89	48	86	49.1	90

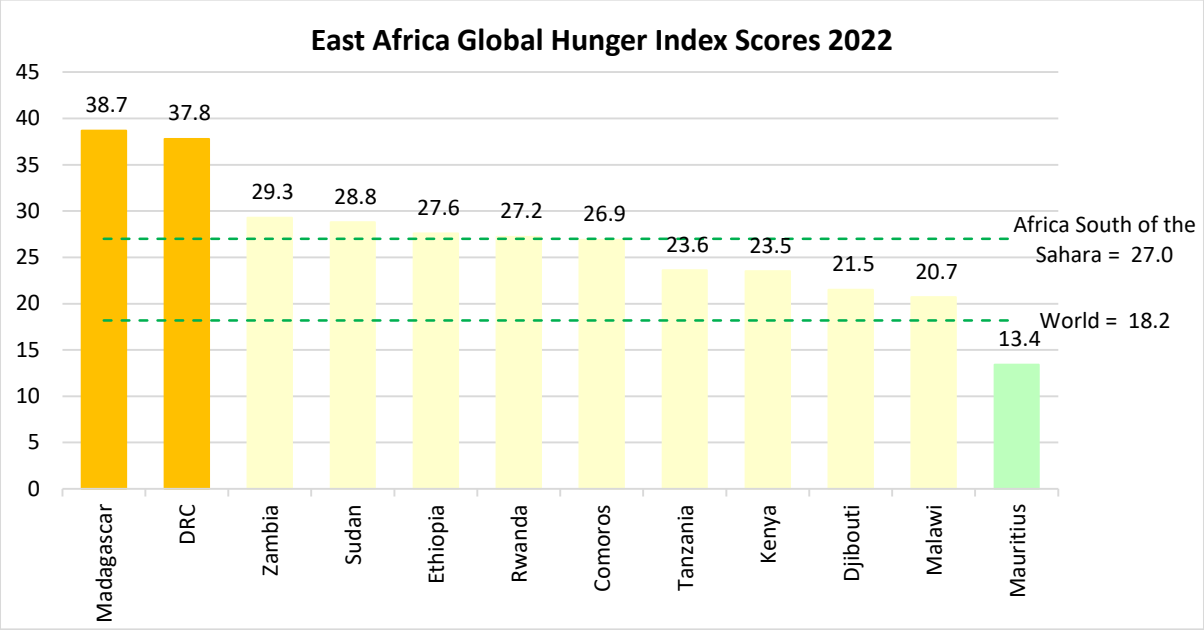
Source: Global Security Index Report 2022

More needs to be done to ensure more East African countries are in the upper quantile of food security, just like northern Africa countries of Egypt, Tunisia, and Algeria, and down south in South Africa.

4.2 EAC Hunger Index

The EAC Partner States are prone to hunger compared to global community *(Figure 13)*. On average, 30% of SSA people face hunger compared to less than 25% in the EAC region. In Africa, 35 million more people were affected by hunger in 2020 compared with 2019, prior to the outbreak of the COVID-19 pandemic, with an additional 15 million in 2021, for a total of 50 million more people in two years. The numbers show persistent regional disparities, with Africa bearing the heaviest burden. DRC is leading in the hunger index (37.8), with a score above the Africa average.

Figure 13: East Africa Global Hunger Index Scores 2022



Source: Global Hunger Index Report 2022

4.3 Status of Regional Food Security

4.3.1 Staple Foods in Partner States

Staple foods are food eaten often and in quantities constituting a dominant portion of a standard diet for a given group of people, supplying a large fraction of energy needs, and forming a significant proportion of the intake of other nutrients. Globally, higher income countries offer support to all food groups, but with particular interest in staple foods which include cereals, roots and tubers. Support is usually given in the form of price incentives. On the other hand, lower income countries penalize production through policies targeting farm prices.

The main types of staple foods are cereals (rice, maize, wheat, rye, barley, oats, millet, sorghum), roots and tubers (potatoes, cassava, yams), and legumes (beans, lentils, soybean). Globally, rice is the major source of staple food for about 3 billion people. It is high in calories, but low in micro-nutrients. **The major food crops in the EAC are maize, rice, potatoes, bananas, cassava, beans, vegetables, sugar, wheat, sorghum, millet and pulses. Cereals are a major food product in EAC. As of December 2021, East African Countries recorded total trade of 182.6 million dollars in cereals.**

Cereals mainly constitute a large portion of staple foods globally, though there usually is a huge discrepancy between production and consumption of the same. Therefore, cereals majorly determine the food security of a country. Most research and development activities target staple foods because these foods mainly determine the food security status of a country. **The share of total cost of staple food in a healthy diet is on average 15% of the total cost of food. Export restrictions have usually targeted staple foods that account for the food security of a country.** Most rural households get their livelihoods from staple food production.

The Russia-Ukraine war has had a significant effect on the supply chain of food. More specifically, Ukraine being a major producer of cereals, has caused a disruption in the food security of most countries.

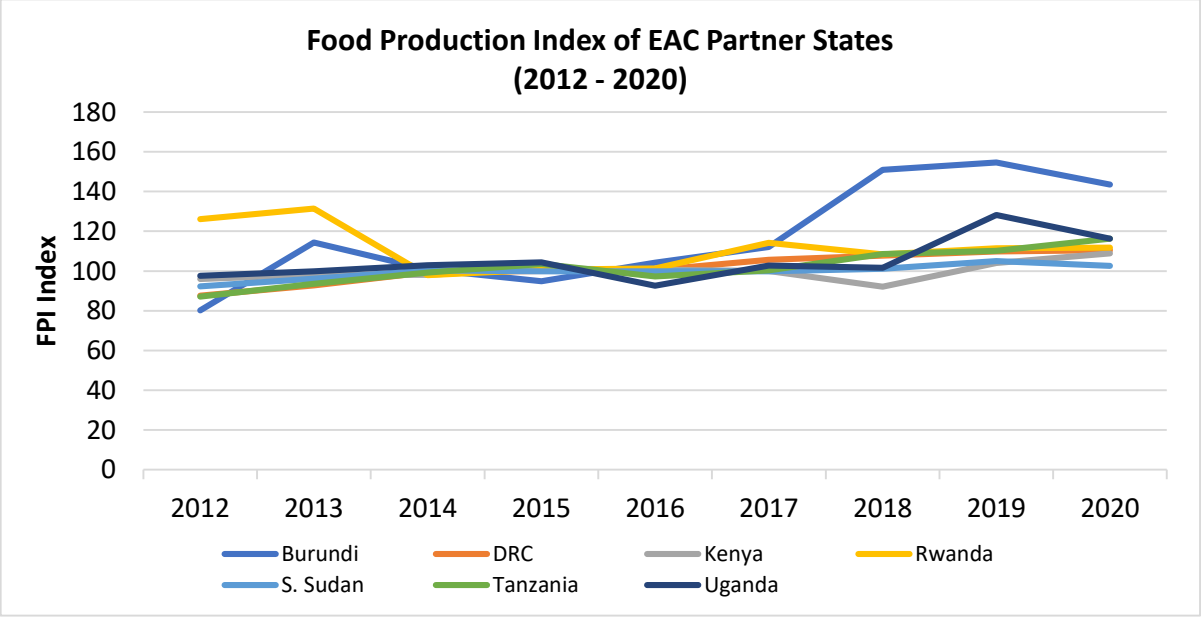
Some of the challenges of food and agricultural policies in most countries globally are the policies that promote staple crop productivity, price incentives, crop-specific input subsidies, and grain procurement for food security stocks which suppress farmers' efforts towards diversification of their production systems.

Market price policies usually target common commodities like wheat, maize and rice. Some incentives target specific staple foods, while others are disincentivized. For instance, in Burundi, Rwanda, and Uganda, price incentives for rice were high in the period 2013-2018.

4.3.2 Food Production

The food production index covers food crops and livestock products, produced locally and those imported, that are considered edible and that contain nutrients. Coffee and tea are excluded because, although edible, they have no nutritive value. **The food production indices for the EAC region are similar, with 2014-2017 being the lowest levels of the region's food production levels *(Figure 14)*.** Burundi has the highest production index followed by Uganda and Tanzania. Kenya and South Sudan production levels are generally low compared to the needs of the respective populations.

Figure 14: EAC Food Production Index



Source: World Bank 2023. World Bank Open Data

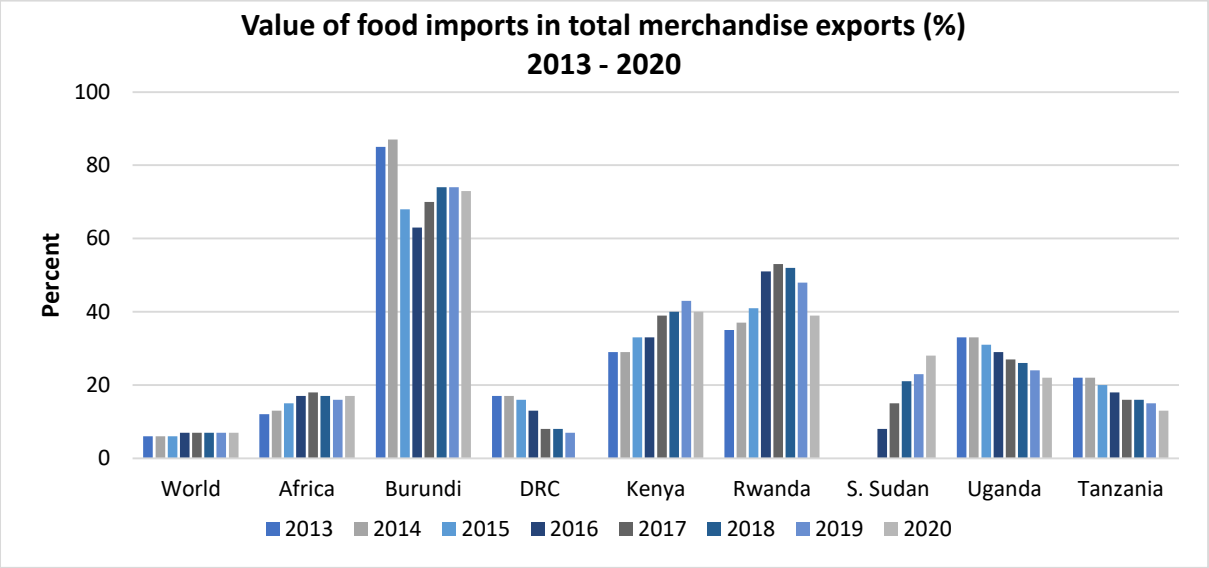
4.3.3 Value of food imports in total merchandise export

Food imports (excl. fish) imports over total merchandise exports indicator provides a measure of vulnerability and captures the adequacy of foreign exchange reserves to pay for food imports, which has implications for national food security depending on production and trade

patterns. There seems to be an increase in the value of food imports in total merchandise in Burundi ad South Sudan over the years. **Most East African countries are net food importers, but they seem to slow down on this in the recent years possibly due to the developments in their food value chains.** Most of these Partner States operate above the Africa and World average, with the exception of United Republic of Tanzania, with Burundi ranking highest followed by Kenya and Rwanda respectively *(Figure 15).*

The EAC Partner States are net food importers, with Burundi importing the highest value as a percentage of total merchandise export despite the high production *(Table 8).* DRC and Tanzania import the least food requirements.

Figure 15: Value of Imports in total merchandise exports (%) 2013-2020



Source: FAO 2023. FAOSTAT: Trade

Table 8: Comparison of Value of food imports in total merchandise export of select countries, %

Area	Year (3- year average)							
	2013	2014	2015	2016	2017	2018	2019	2020
World	**6**	**6**	**6**	**7**	**7**	**7**	**7**	**7**
Africa	**12**	**13**	**15**	**17**	**18**	**17**	**16**	**17**
Burundi	85	87	68	63	70	74	74	73
DRC	17	17	16	13	8	8	7	
Kenya	29	29	33	33	39	40	43	40
Rwanda	35	37	41	51	53	52	48	39
S. Sudan				8	15	21	23	28
Tanzania	22	22	20	18	16	16	15	13
Uganda	33	33	31	29	27	26	24	22

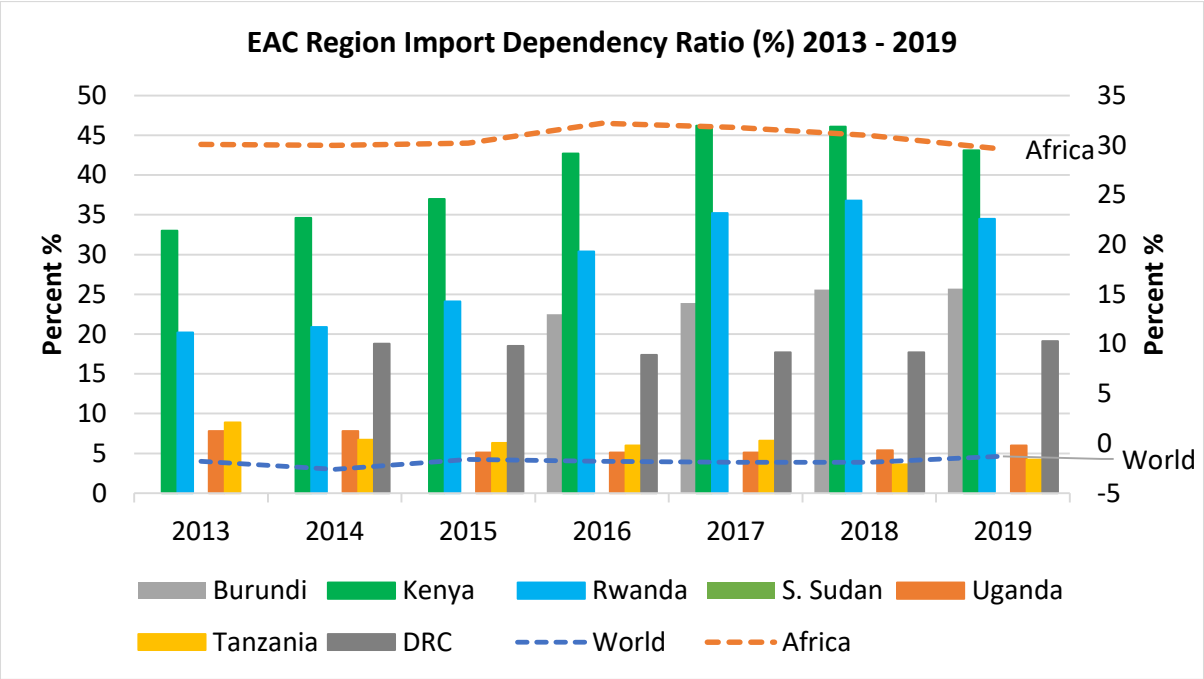
Source: FAO 2023. FAOSTAT: Trade

4.3.4 EAC Cereal Import Dependency

In the EAC region Burundi, Kenya, and Rwanda had the highest import dependency ratios *(Figure 16)*. This could be due to their staple foods mainly being cereals which are

not adequately produced in their respective countries. Uganda and United Republic of Tanzania on the other hand seem to import less of the food, possibly because they are able to meet their local needs as cereals also constitute some of their staple foods.

Figure 16: Cereal Import Dependency Ratio EAC 2013 - 2019 (%)



Source: FAO 2023. World Food and Agriculture Statistical Yearbook 2022

Given the importance of cereals as staple foods worldwide and the discrepancy between consumption and production in many countries, a measure of food security is the cereals imports dependency ratio, defined as the net trade of cereals (imports minus exports) divided by the total cereals supply in a country (the country's own production plus the imports minus the exports). That is, a measure of how much of the available domestic food supply of cereals has been imported and how much originates in the country's production. Kenya and Rwanda import high quantities of their food requirements. The higher the scale, the more dependent a country is in cereals imports. *Figure 17* compares the index across Partner States with Africa and world averages.

4.3.5 Regional food products exported to the rest of the world

EAC Partner States are involved in more or less similar trade items, which are mainly borrowed from their staple foods. Most of the stakeholders who are in the private sector have highlighted maize, beans, Irish potatoes, rice, bananas, vegetables, sorghum, and millet as their commonly traded food items[4]. However, the latest addition to the EAC, Democratic Republic of Congo (DRC) seems to hold a different view in that they consider ginger among their major food traded in their countries besides their staples- maize, beans, Irish potatoes, and cassava. Rwanda on the other hand highlights their major cash crops as their major trade items-honey,

[4] Food items have excluded coffee and tea.

macadamia nuts, and chilies. In Tanzania, of the staple foods, vegetables are also major traded foods, with onions standing out. Uganda on the other hand considers pulses besides cereals and bananas as their commonly traded foods. Kenya's market is flooded by the staple foods, mainly maize, and other emerging food items such as avocado. Cabbage is also considered a good crop in the vegetable category in Kenya.

4.4 EAC Food Prices

4.4.1 Domestic Prices

Producer Prices

Various factors affect the prices producers receive for the crops they produce. The **volatility in global prices and the EAC region has been due to pressures such as poor harvests, high production costs, market structure, subsidy schemes and unforeseen global shocks**. **The war in Ukraine especially has had a negative impact in the form of higher prices and overall lower fertilizer affordability in 2021/22.** Similarly, the structure of global food supply chains also influences the transmission of price shocks between producers and consumers; resulting in different rates of change in producer prices compared to consumer prices. The potential impacts of these factors and global shocks on overall agricultural production and food security are difficult to gauge in the long run for the EAC region.

Consumer Prices (Affordability)

Globally consumer price inflation rose to record levels with the onset of the COVID-19 pandemic in 2020 *(Table 9)*, impacting food security of countries. Consumer prices are projected to remain above pre-pandemic levels due to increasing energy and fertilizer prices brought about by the war in Ukraine. The high domestic prices are reflected in the high operating inflation rates.

The trend of inflation rate was the same in the EAC region with the highest increases in the period 2019 to 2020 experienced in Burundi, and Rwanda presenting the region with a potential cost-of-living crisis with high food price inflation rates.

Table 9: Inflation in Food Consumer Prices in EAC 2013-2020(%)

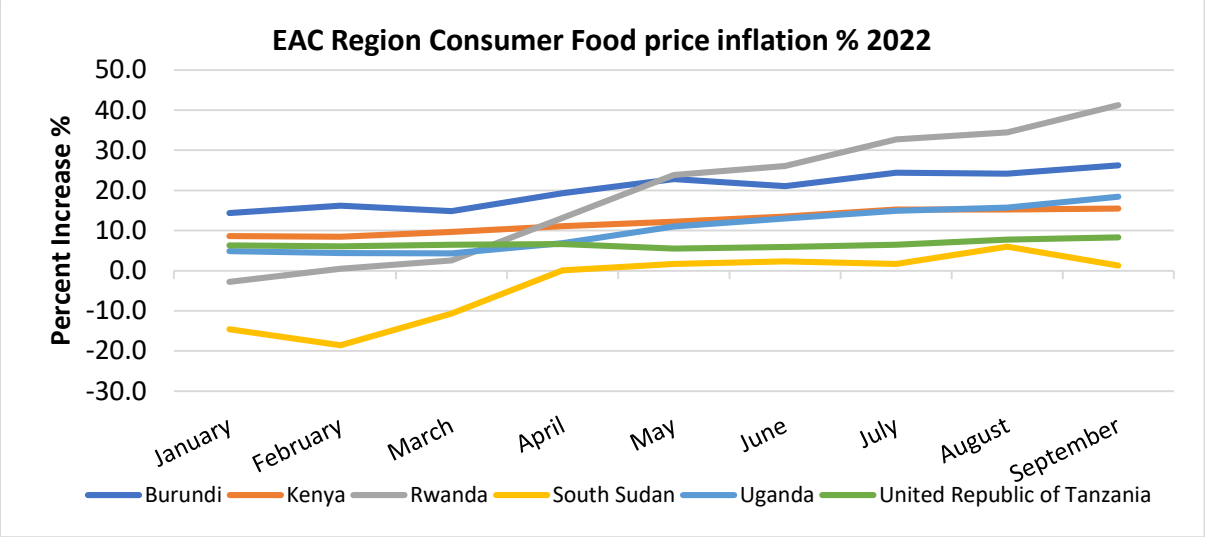
Country	2013	2014	2015	2016	2017	2018	2019	2020	2021	% Change	
										2018-19	2019-20
Africa	**7.2**	**7.1**	**7.7**	**12.1**	**17.3**	**9.5**	**7.9**	**8.8**	**13.1**	**-1.6**	**0.9**
Eastern Africa											
Burundi	9.5	2.3	5.7	7.2	24.0	-11.1	-3.1	12.1	10.4	8.0	15.2
Kenya	7.2	8.7	11.4	10.1	13.4	1.4	6.4	6.4	8.9	5.0	0.0
DRC	0.7	1.4	0.8	3.0	11.7	1.7	1.5	1.5	1.5	-0.2	0.0
Rwanda	8.6	2.6	3.6	12.6	12.8	-7.4	3.5	15.7	-4.1	10.9	12.2
S. Sudan	-3.1	2.5	53.7	333.7	210.6	71.6	106.4	24.4	13.5	0.0	0.0
Tanzania	8.5	7.4	7.9	7.5	9.1	3.0	2.9	4.1	3.7	-0.1	1.2

Uganda	2.3	3.5	7.2	5.6	10.2	-1.2	-0.2	1.8	1.4	1.0	2.0

Source: FAO 2023. FAOSTAT: Prices

In the period January to September 2022, food price inflation in the EAC region *(Figure 17)* rose gradually due to supply chain constraints and effects of the war in Ukraine on commodities and imports.

Figure 17: EAC Region Food Price Inflation % 2022 (Jan-Sep 2022)



Source: FAO 2023. FAOSTAT: Prices

4.4.2 Affordability

The effects of inflation on consumer food prices originating from the economic impacts of the COVID-19 pandemic and the various containment measures effected by countries worldwide have increased the costs and unaffordability of healthy diets by populations.

The affordability of a healthy diet measures the average cost of the diet relative to income. **Rising food costs and prices without corresponding rises in incomes have led to more people at the global and regional level being unable to afford healthy diets**. *Table 10* below shows that costs of healthy diets and the number of people unable to afford (*Figure 18)* them have been on rise globally. Regionally, in the EAC, Burundi and DRC have the highest share of the population unable to afford a healthy diet in 2020 at 97.2% and 90.0% respectively, with other Member States averaging 80% (Tanzania 87.6%, Kenya 81.1%, Rwanda 86.3%, and Uganda 82.2%). DRC and Tanzania have the greatest numbers of the population unable to meet healthy dietary needs at 80.6 and 52.3 million people respectively.

Table 10: The Cost and Affordability of a Healthy Diet by Region and Country 2017 - 2020

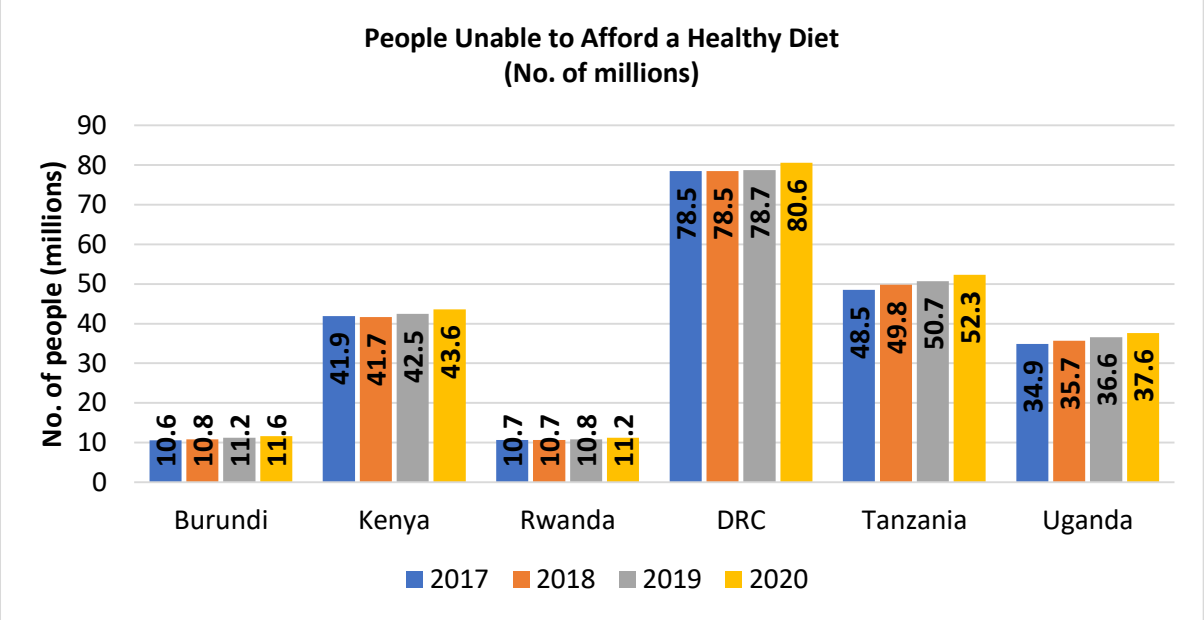
	Cost of healthy diet			**People unable to afford a healthy diet**					
	USD Per person per day			*Percent (%)*			*Total No. (millions)*		
	2017	**2019**	**2020**	**2018**	**2019**	**2020**	**2018**	**2019**	**2020**
WORLD	**3.314**	**3.425**	**3.537**	**41.5**	**40.9**	**42.0**	**2,973.8**	**2,961.9**	**3,074.2**
AFRICA	**3.248**	**3.376**	**3.460**	**80.2**	**79.9**	**79.9**	**985.3**	**1,005.6**	**1,031.0**

Eastern Africa	**3.022**	**3.257**	**3.367**	**86.7**	**87.2**	**87.4**	**339.0**	**350.4**	**360.8**
Burundi	2.988	2.783	2.943	97.0	96.9	97.2	10.8	11.2	11.6
DRC	2.291	2.127	2.077	93.3	90.7	90.0	78.5	78.7	80.6
Kenya	2.846	2.907	2.968	81.2	80.7	81.1	41.7	42.5	43.6
Rwanda	2.609	2.537	2.698	86.6	85.2	86.3	10.7	10.8	11.2
S. Sudan	-	-	-	-	-	-	-	-	-
Tanzania	2.598	2.681	2.736	88.3	87.4	87.6	49.8	50.7	52.3
Uganda	2.749	2.678	2.658	83.5	82.7	82.2	35.7	36.6	37.6

Source: FAO 2023. FAOSTAT: Food Security and Nutrition

As the lasting effects of COVID-19 and the war in Ukraine continue to exert pressure on supply chains affecting economic recovery worldwide, it is projected that the unaffordability of a healthy diet will rise globally and regionally affecting overall food security. At the Partner State level, DRC and Tanzania have had the highest increase in number of people unable to afford a healthy diet due to also their large population (*figure 18*).

Figure 18: People unable to afford a healthy diet EAC 2017-2020 (no. of millions)

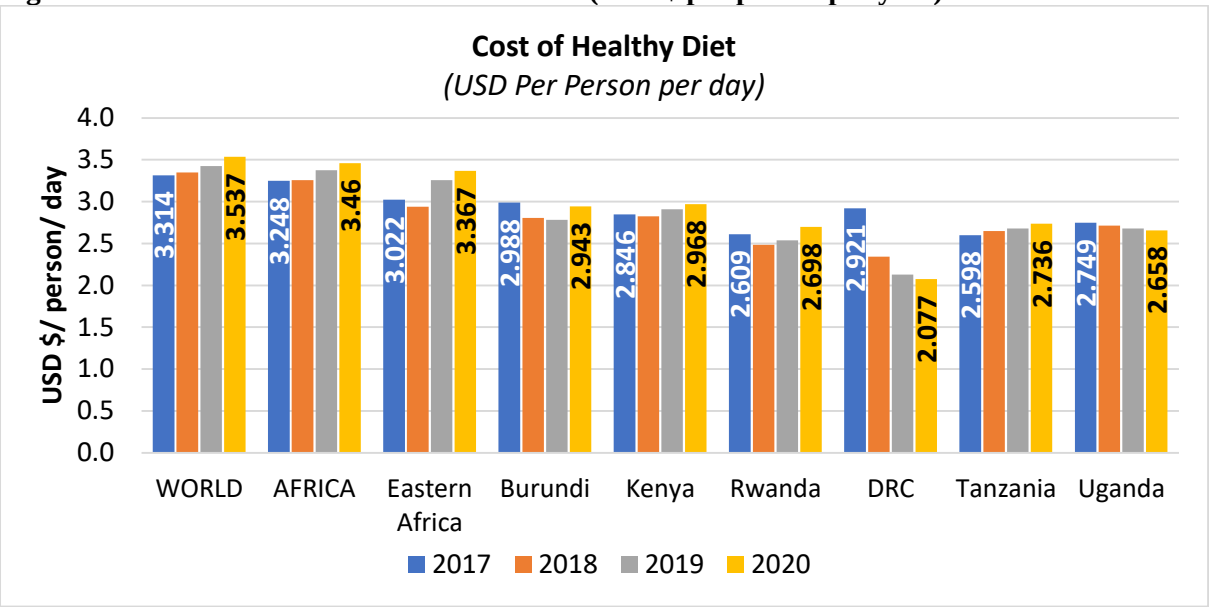


Source: FAO 2023. FAOSTAT: Food Security and Nutrition
**S. Sudan data not available*

Cost of a healthy diet

In the EAC region, the costs of a healthy diet have been rising except for Uganda where there has been a reduction in costs from 2017 *(Figure 19)*. Nevertheless, **the costs of a healthy diet have been increasing especially in light of global shocks caused by the COVID-19 pandemic and the war in Ukraine.**

Figure 19: Cost of Health Diet EAC 2017-2020 (USD $ per person per year)

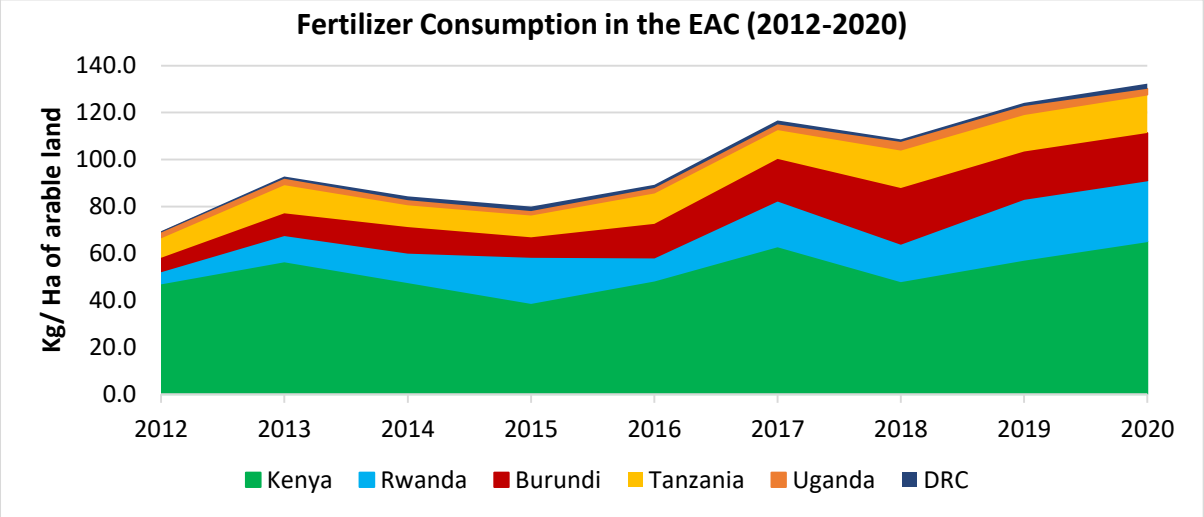


Source: FAO 2023. FAOSTAT: Food Security and Nutrition

4.4.3 Fertilizer usage

Fertilizer consumption in the EAC has been steadily on the rise from 2015 ***(Figure 20)***, in line with the region's high dependence on agriculture as it contributes 25-40% of EAC Partner States GDP and is a leading employer to over 80% of the region. **Majority of the fertilizer is consumed in Kenya while the least is in DRC.**

Figure 20: Fertilizer Consumption in the EAC 2012-2020 (kg/ha)



Source: World Bank 2023. World Bank Open Data

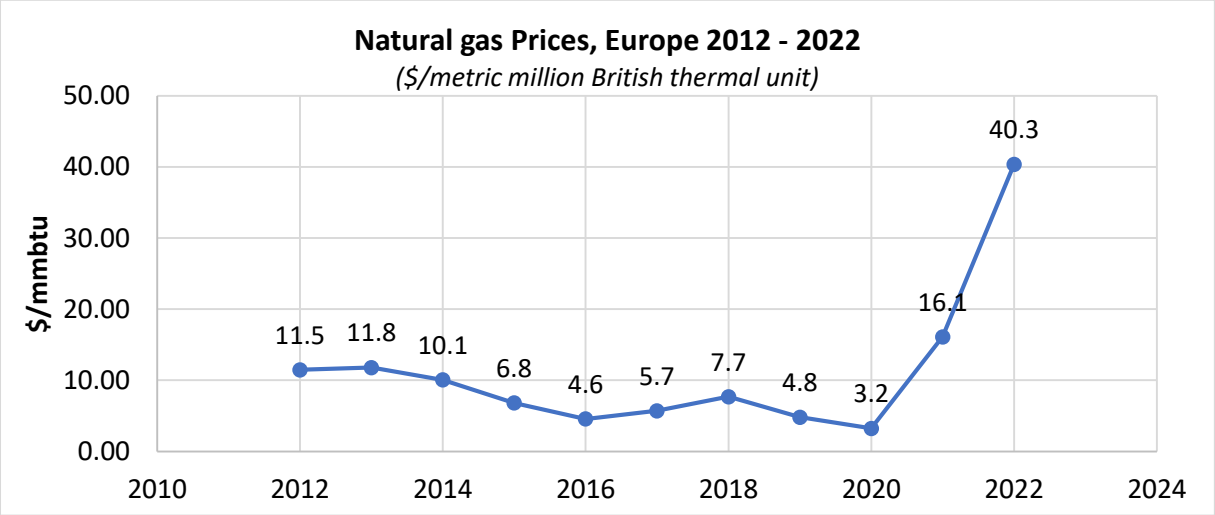
4.4.4 Energy

Agricultural production is energy intensive directly through on-farm fuel, natural gas and electricity consumption, and indirectly through the use of pesticides, lubricants and fertilizers. Natural gas especially is a key component in the N-fertilizer production process and nitrogenous fertilizers are crucial inputs in plant growth and reproduction.

Prices for natural gas rose sharply in 2021($16.1 per month) and continued in 2022 ($40.3 per month) as shown in *Figure 21* due to various reasons such as adverse weather conditions that hampered renewable energy production and fall in gas supplies from the Russian Federation.

The recent surge in agricultural input prices is raising concerns about rising costs of food production, since changes in production costs readily translate into changes in food prices (FAO, IFAD, UNICEF, WFP, and WHO, 2022).

Figure 21: Natural gas prices, Europe Average 2012-2022 ($/month)



Source: World Bank 2023. Commodity Price Data (Nominal 2010=100)

At the onset of the Ukraine War, energy prices witnessed a sharp increase amid fears of energy supply disruption and global economic sanctions on the Russian energy industry.

4.4.5 Freight Costs

At the onset of the COVID-19 pandemic, global transportation costs are highest from 2020 - 2021 *(Figure 22)* due to disruptions in commodity supply chains and export restrictions by food exporting nations. **The sharp increase in 2021 in the shadow of the COVID-19 pandemic; led to concerns of even higher costs for importers and lowered accessibility to international markets for imported commodities such as food and fertilizers as they are traded largely in bulk form.**

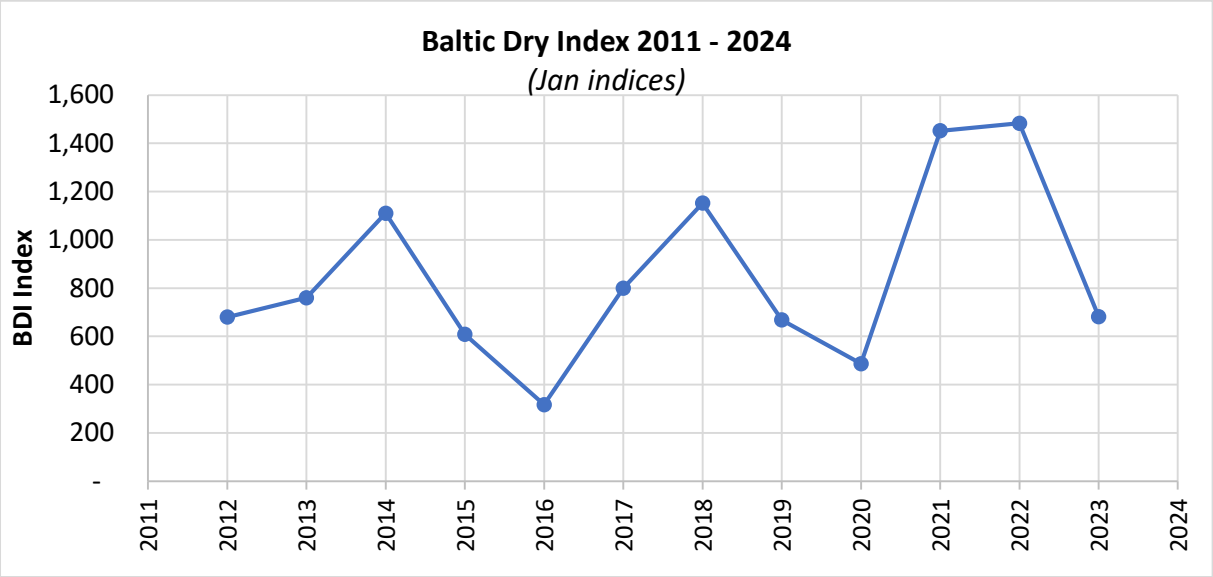
The Baltic Dry Index (BDI)[5], a measure for bulk freight quotations, provides a highly indicative gauge of actual shipment costs. *Figure 22* below shows that landing prices increased between 2020 – 2022 at the peak, but the BDI has since declined from December 2022 giving relief to importers.

The decline reflected global recessionary pressures, particularly a fall in international demand by China – the world's largest importer of bulk commodities. However, as

[5] A shipping freight-cost index issued daily by the Baltic Exchange: https://www.balticexchange.com

evidenced in *Figure 22*, international freight prices are notoriously volatile. A demand shock when shipping capacities are low or overstretched can send freight costs skyrocketing. Accordingly, importers had to keep a close watch on developments in the international freight market, since any benefit from lower export quotations (FOB prices) could be quickly eroded through higher shipping costs (FAO, IFAD, UNICEF, WFP, and WHO, 2022)

Figure 22: Baltic Dry Index 2011-2024



Source: The Baltic Exchange 2023. Baltic Dry Index (BDI)

4.5 EAC Inflation

The trend of inflation rate in the EAC region, maintained similar trends with global inflation *(Table 11)*, with the highest increases in 2020 experienced in South Sudan (24.4), and Rwanda (15.7) presenting the region with a potential cost-of-living crisis with high food price inflation rates.

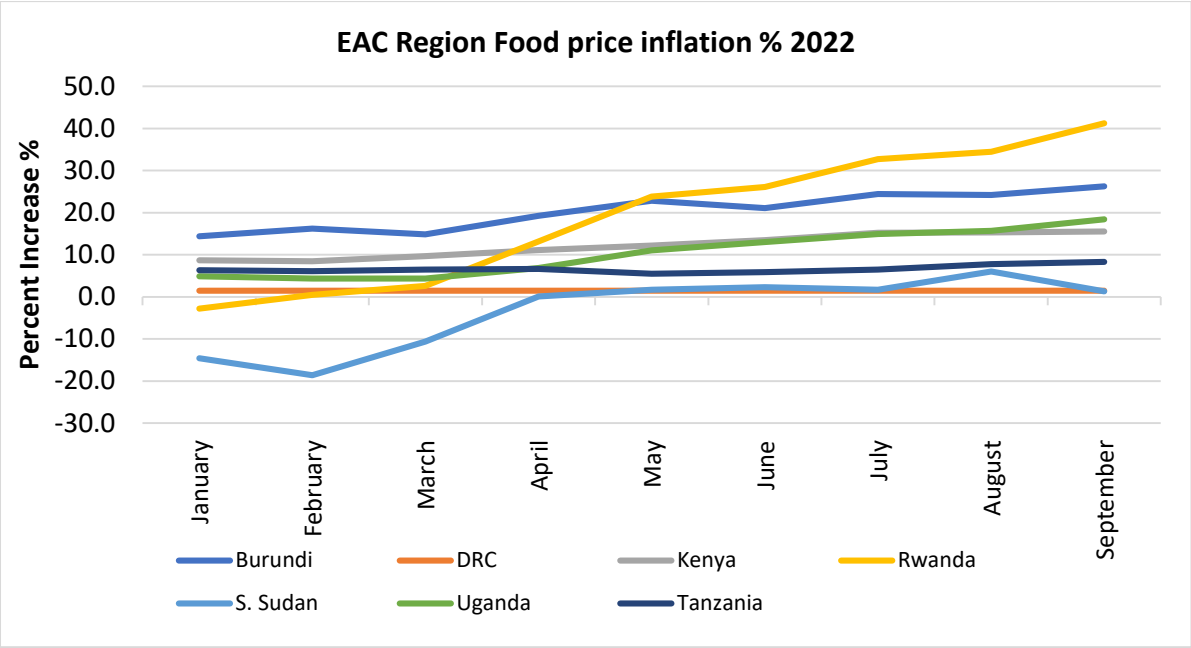
Table 11: Inflation in food consumer prices in EAC 2013-2020 (%)

Country	2013	2014	2015	2016	2017	2018	2019	2020	2021
Eastern Africa									
Burundi	9.5	2.3	5.7	7.2	24.0	-11.1	-3.1	12.1	10.4
DRC	0.7	1.4	0.8	3.0	11.7	1.7	1.5	1.5	1.5
Kenya	7.2	8.7	11.4	10.1	13.4	1.4	6.4	6.4	8.9
Rwanda	8.6	2.6	3.6	12.6	12.8	-7.4	3.5	15.7	-4.1
S. Sudan	-3.1	2.5	53.7	333.7	210.6	71.6	106.4	24.4	13.5
Tanzania	8.5	7.4	7.9	7.5	9.1	3.0	2.9	4.1	3.7
Uganda	2.3	3.5	7.2	5.6	10.2	-1.2	-0.2	1.8	1.4

Source: FAO 2023. FAOSTAT: Prices

In the period January to September 2022, food price inflation in the EAC region *(Figure 23)* rose gradually due to supply chain constraints and effects of the war in Ukraine on commodities and imports.

Figure 23: EAC Region Food Price Inflation % (Jan-Sep 2022)



Source: FAO 2023. FAOSTAT: Prices

5.0 CLIMATE CHANGE

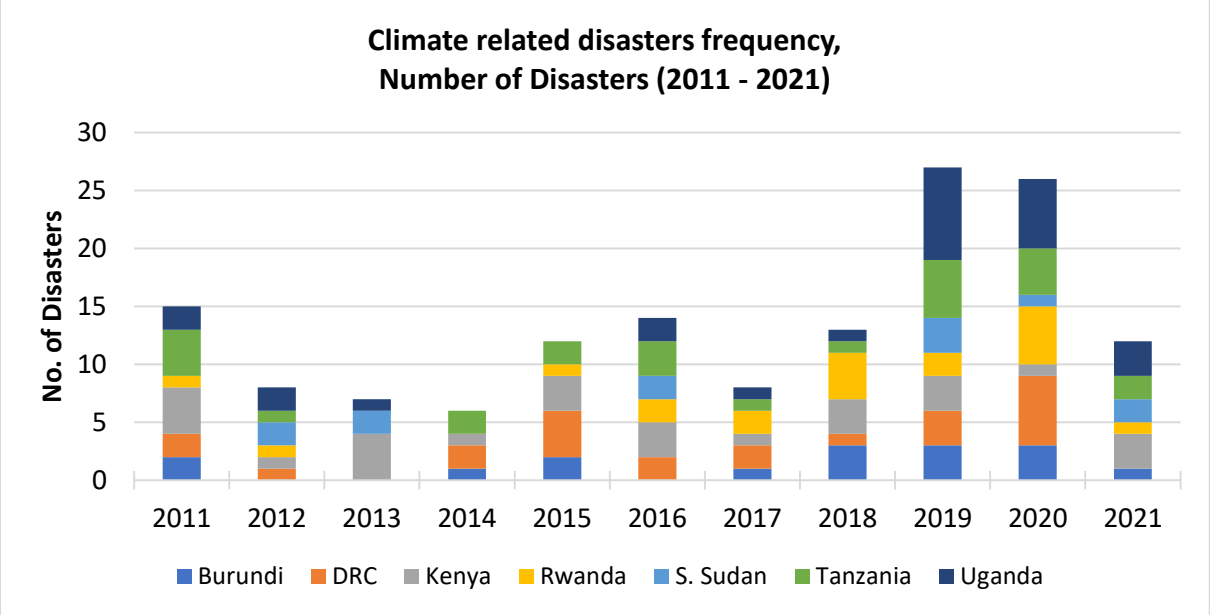
Worldwide climate change has affected food security due to warmer surface temperatures, erratic and unpredictable rain patterns, all resulting in increasing frequency of extreme weather events. Climate change has a multiplier effect on hunger and food insecurity, poverty and income levels, and scarcity of already limited natural resources. In addition to this, increasingly frequent severe climatic events have a disruptive effect on supply chains, especially in low-income countries.

5.1 Impact of climate change on EAC Food Security

There has been worsening climate patterns recently, most notably the drought in the horn of Africa countries. As a result of the culmination of events leading to disruptions in food supply since 2020, there has been crop failure due little to no rain in East Africa, and the death of livestock which provide alternative food and livelihoods for pastoralist communities.

***Figure 24* shows that between 2015 – 2020 the number of climate related disasters in the EAC region have been increasing. Severe droughts, floods and extreme weather events associated with climatic variability are occurring with greater frequency and intensity in the region**. The dependence on rain-fed agriculture in the EAC region implies that agricultural production is highly vulnerable to climatic variability and climate change. **Climate change viability not only has an effect on agricultural productivity in the EAC, but also on energy production and transmission as hydropower amounts for 30-90% of the energy produced in the EAC.**

Figure 24: EAC Climate Related Disasters Frequency No. 2011-2021

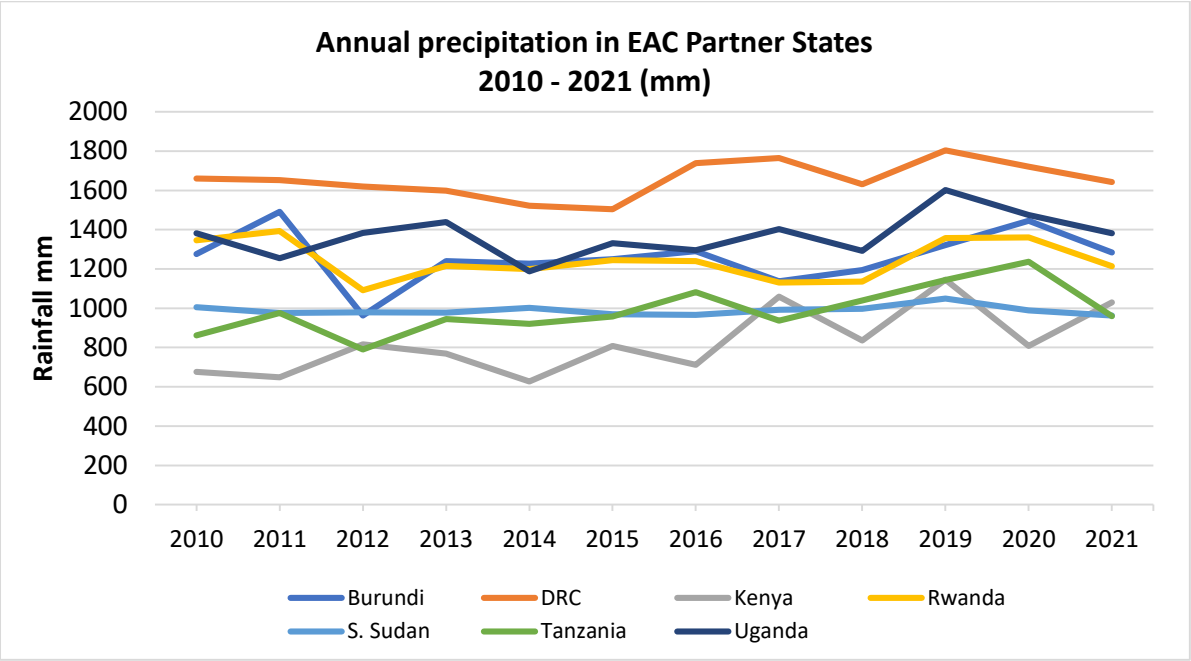


Source: International Monetary Fund. 2023.Climate Change Indicators Dashboard

5.1.1 Rainfall

Kenya registers low rainfall compared to the other EAC Partner States. DRC, Uganda, Rwanda, and Burundi receive the highest rainfall. South Sudan and Tanzania receive rainfall above Kenya. Consequently, there seems to be a food surplus in the countries receiving higher rainfall, with the exception of South Sudan, hence countries like Kenya rely on the deficit to be met by its neighbouring countries like Uganda and Tanzania. South Sudan inadequacy of food supply is mainly driven by conflicts leading to people abandoning their homes and farms in search of security. However, heavy rainfall also leads to the rot of food crops in farms and poorly constructed storage facilities leading to food shortages, which are post-harvest losses. **In Kenya, low rainfall was recorded in 2011, 2016, 2018 and 2020; Burundi- low rainfall in 2012, 2017 and 2021; Rwanda - low rains recorded in 2012, 2018 and 2021; and Tanzania- low rains recorded in 2012, 2021 *(Figure 25)*.**

Figure 25: Annual Precipitation in EAC Partner States 2010-2021 (mm)

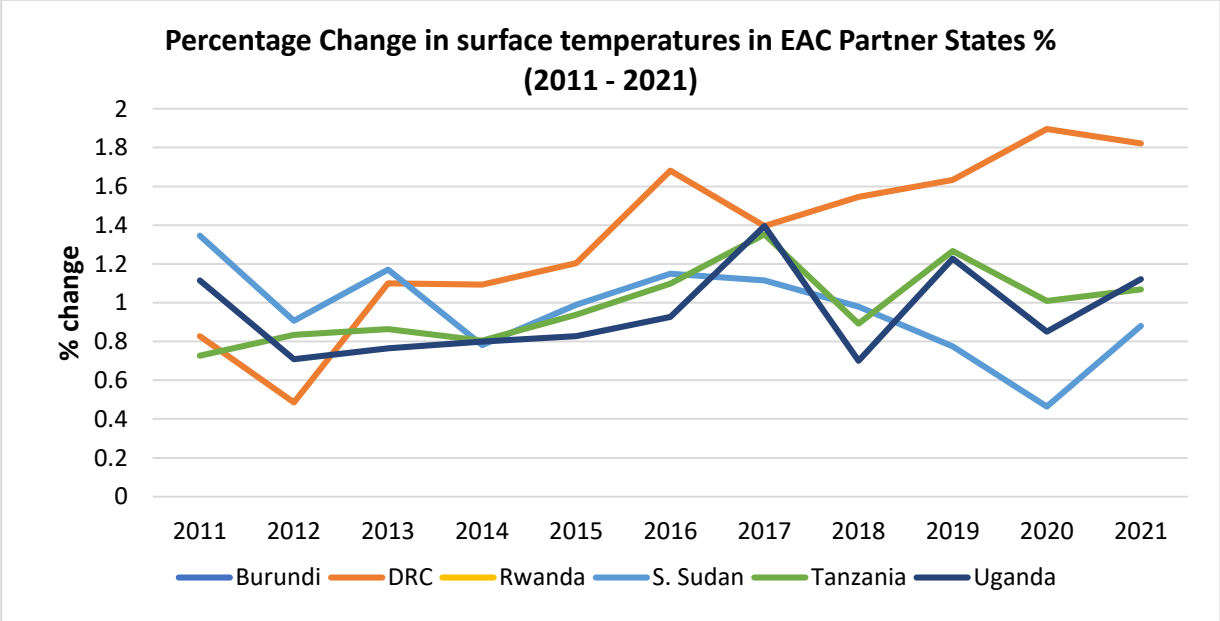


Source: World Bank Group 2023, Climate Change Knowledge Portal

5.1.2 Temperature

Variability of temperature in DRC is highest when compared with the rest of the EAC Partner States. In 2017, due to worsening climatic conditions, eastern Kenya, South Sudan and Uganda were hit by a recurrent drought that destroyed major crops and raised food prices in these countries *(Figure 26)*. Not only does the temperature change affect crops, but also livestock such as cattle lack feed hence deaths, and for the available ones, there is a drop in milk production leading to inflation. Therefore, **global warming leads to adverse weather which affects long term food crops.**

Figure 26: Percentage change in surface temperature in EAC Partner States % (2011-2021)



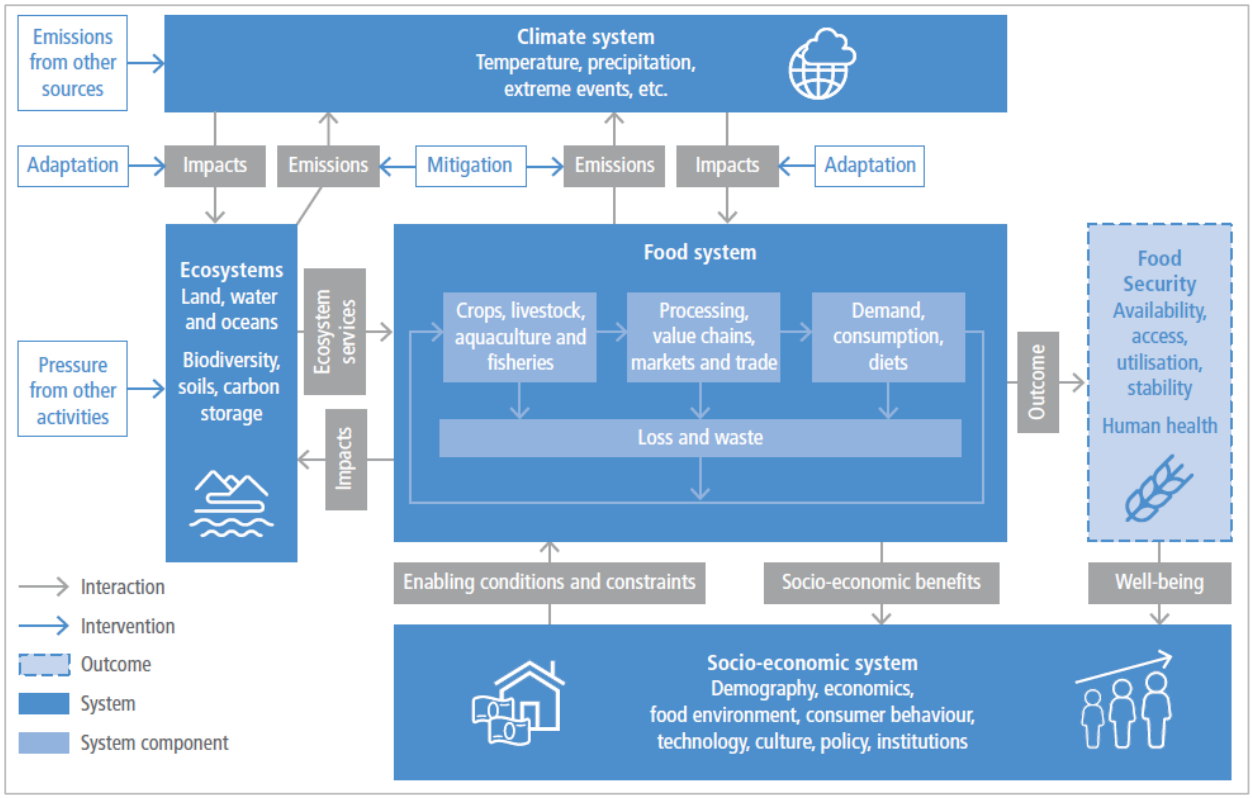
Source: World Bank Group 2023, Climate Change Knowledge Portal

***BDI % RWA data not available*

Most countries are prone to the effects of drought since in East Africa, rain-fed agriculture is common, especially in the rural areas which are the bread baskets of most partner states. Climate change has further caused inflation due to decreased levels of water levels in dams used for producing hydropower, hence having a negative impact on livelihoods of people. Further, due to the decreased harvest experienced in most East African countries, protective measures were put in major traded commodities such as maize by banning/ limiting exportation of the commodity. Such was the case for Kenya where Tanzania, despite experiencing a good harvest in 2021 of 469,474 tonnes from 98,000 tonnes in 2020, the ban of 2022 was to protect its local stock following poor harvest (Business Daily, 2022). This led to Kenya importing maize from as far as Zambia through the Namanga border, since its main supplier, Tanzania issued one-off export permits to discourage Kenyan importers, whereas Uganda opted to sell to South Sudan, where maize prices were good for their exports.

Figure 27 highlights the linkages between climate change and food security and socioeconomic well-being. Green gas emissions, unless moderated lead to deterioration in the ecosystems with negative effects on food production, prices and affordability. Nutrition and socio-economic wellbeing are compromised.

Figure 27: Interlinkages between the climate system, ecosystems and socio-economic systems



Source: IPCC 2023. Climate Change and Land Report 2019

PART IV: IMPACT OF GLOBAL CRISES ON EAC FOOD INSECURITY ON SOCIO-ECONOMIC INDICATORS

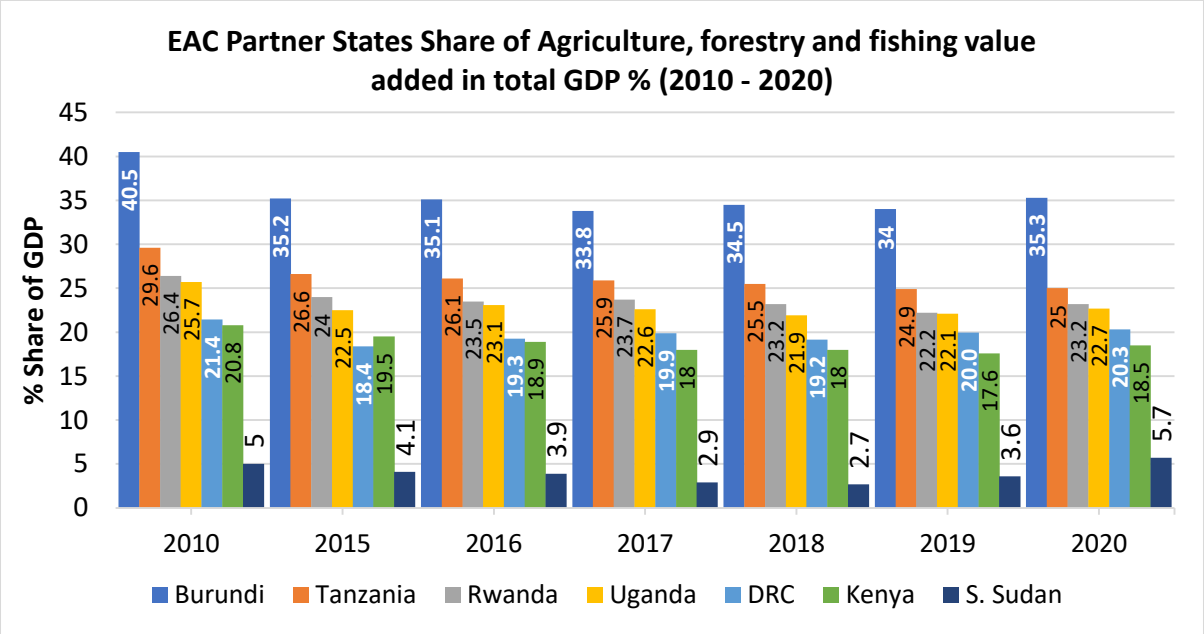
6.0 ECONOMIC INDICATORS

6.1 Socio-economic and Macro-economic effects of food insecurity

Contribution to Gross Domestic Product (GDP)

The global value-added generated by agriculture, forestry and fishing grew by 78 percent in real terms between 2000 and 2020, reaching USD 3.6 trillion in 2020. This represents an increase of USD 1.6 trillion compared with 2000. In Africa, the value added more than doubled over the period (+147%), increasing from USD 167 billion to USD 413 billion (FAO 2022). **Agriculture contribution in GDP is highest in Burundi and lowest in South Sudan. The remaining countries operate between 18.5 - 25.0% agriculture contribution to GDP *(Figure 28)*.**

Figure 28: Share of agriculture, forestry, and fishing value added in total GDP

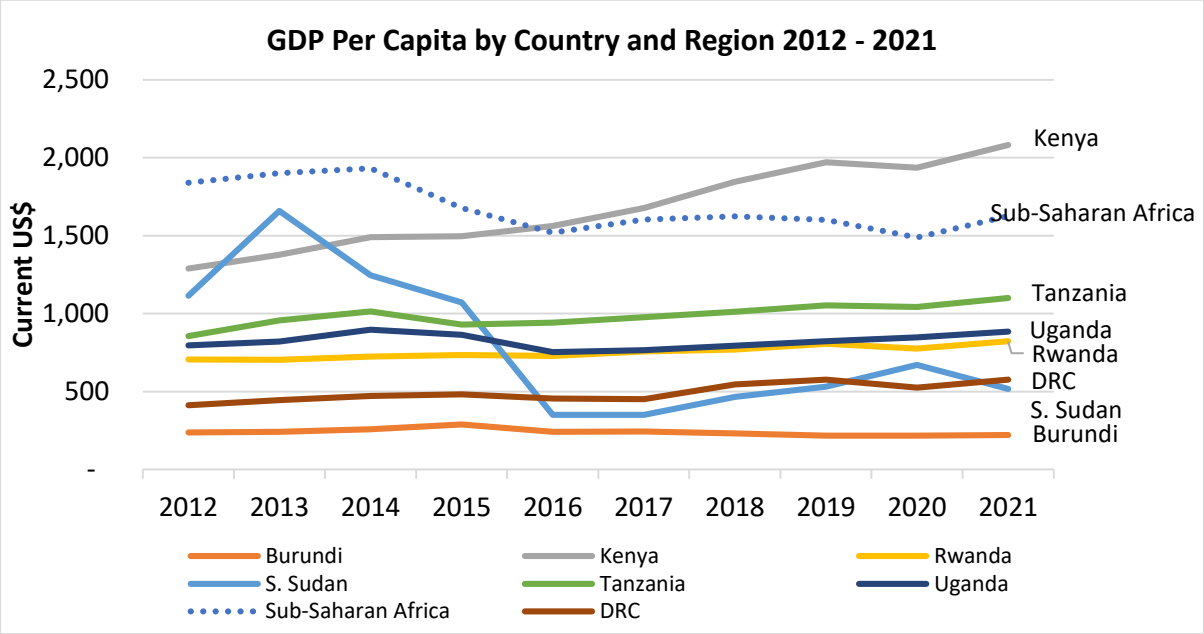


Source: FAO 2023. FAOSTAT Macro-Economic Indicators

GDP per Capita

The Sub-Saharan GDP per capita averages between USD 1500 and USD1700 *(Figure 29)*. Of the Partner States, only Kenya is above the Sub-Saharan Africa average with over USD 2000 in 2021, which has been a steady increase over time. Burundi has the lowest GDP per Capita in the region, with South Sudan not having a steady trend. **With increasing GDP, there should be better ways of handling the food security situation that needs to be addressed for better outcomes.**

Figure 29: GDP Per Capita by Country and Region 2012-2021



Source: World Bank 2023. World Bank Open Data

Population – Gender Differences in food Security

There is also a growing gender gap in food insecurity *(Figure 30)*. Historically, women tend to be disproportionally affected by health and economic crises in a number of ways, including but not limited to food security and nutrition, health, time burden, and productive and economic dimensions (FAO, IFAD, UNICEF, WFP, and WHO, 2022).The **COVID-19 pandemic had as disproportionate impact on women's economic opportunities and access to nutritious foods.**

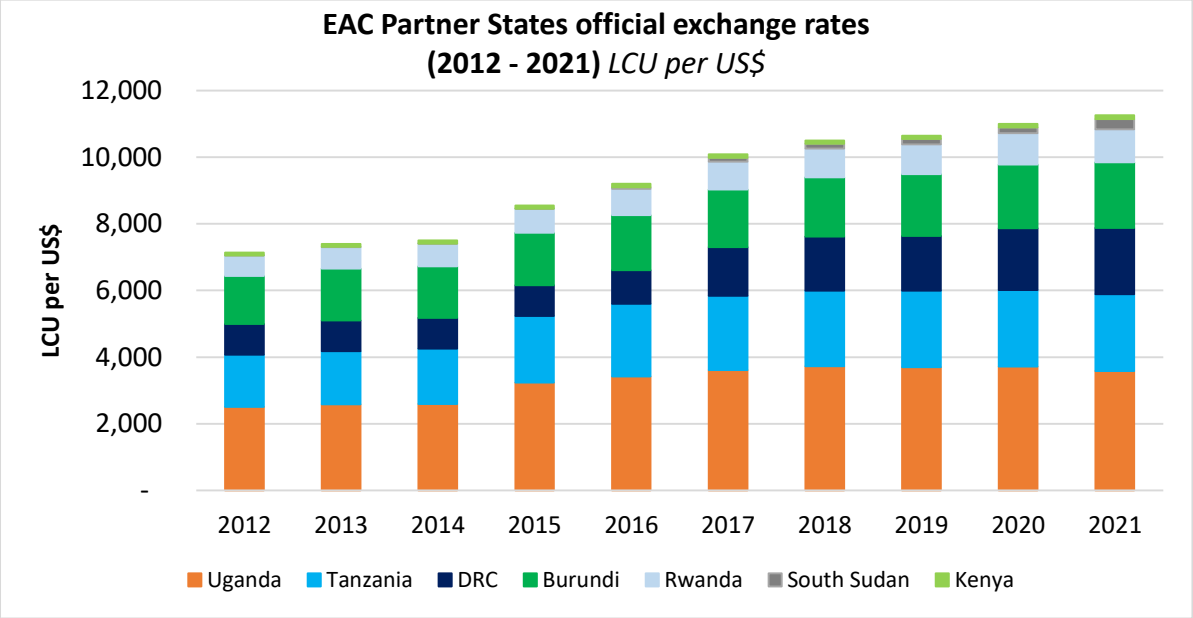
Figure 30: Gender dimension on the prevalence of food insecurity

Source: FAO 2023. The State of Food Security and Nutrition in the World 2022

Exchange Rates

All the regional currencies maintained gradual depreciation against the dollar, with highest depreciation aligned to climate change variabilities, COVID 19 and Ukraine-Russia war *(Figure 31)*.

Figure 31: EAC Partner States official exchange rates- 2012-2021



Source: World Bank 2023. World Bank Open Data

6.2 Trade and Competitiveness

6.2.1 Regional & Global trade patterns in Agriculture and Food commodities in EAC

EAC Partner States are involved in more or less similar trade items, which are mainly borrowed from their staple foods. Common traded food products are maize, beans, Irish potatoes, rice, bananas, vegetables, with sorghum and millet being mainly locally traded food items[6].

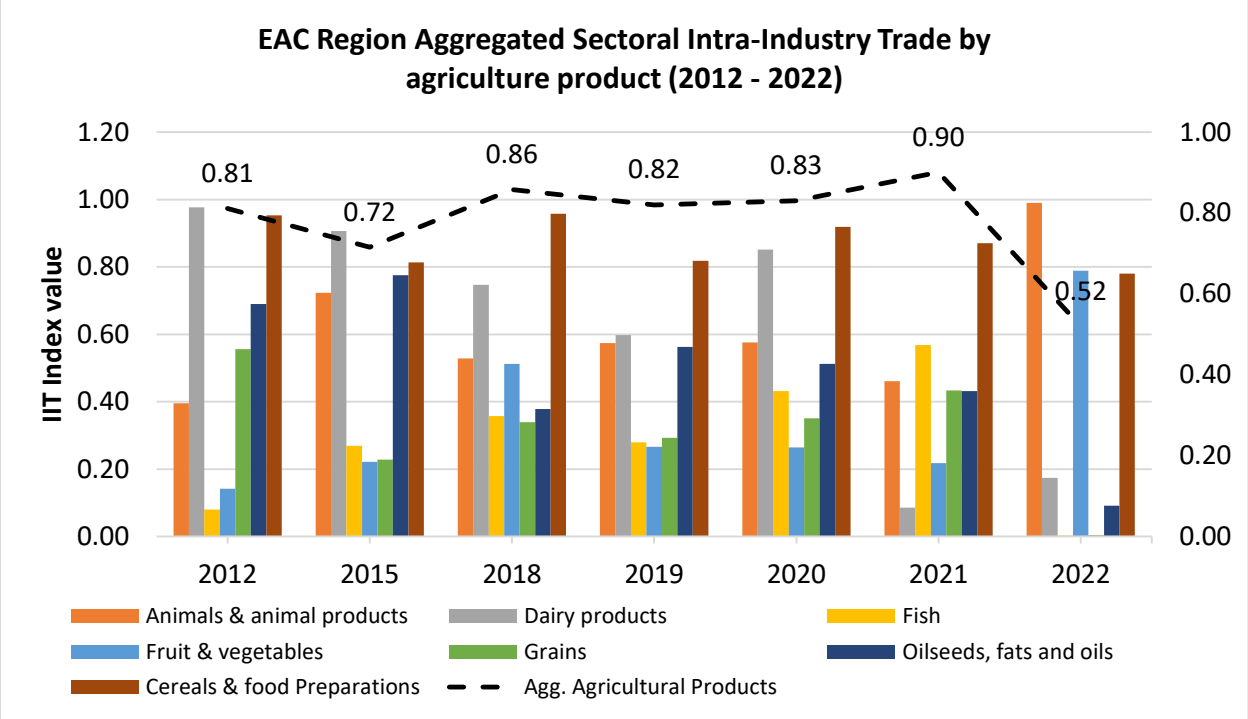
Other emerging traded food products include ginger spice by Democratic Republic of Congo (DRC), chilly, macadamia nuts, honey, among others. Of particular interest is the maize crop, wheat, and rice which are manly staple foods, and edible oil which are imported in substantial quantities. Other input imports impacting food production include fuel, fertilizer seeds, chemicals. Access to these inputs was impaired by COVID 19 and the Ukraine-Russia conflict. Freight transport, especially during COVID lockdowns and trade embargoes further exacerbated product specific prices.

[6] Food items have excluded coffee and tea.

6.2.2 Intra-Industry Trade

The aggregate intra-industry trade index provides an overall measure of the EAC regions economic trade profile. ***Figure 32*** **below highlights that the highest economies of scale in the agricultural sectors are found in animal and animal products; dairy products; cereals and food preparations respectively. It also shows that aggregate intra-industry trade remained stable until 2022 where the index score decreased by 32% 2022 from the index value of the previous year.** The concentration of intra-industry and intra-firm trade in particular products means that the international transmission of the certain industry- or product-specific global shocks may be especially rapid. **This is seen by the decline in grains, oilseeds, fats and oils from 2020 and especially in 2022. This can be attributed to the lingering effects of the COVID-19 pandemic and the war in Ukraine. The most traded items were cereals and food preparations followed by dairy products.**

Figure 32: EAC Regional Intra-Industry Trade by agriculture product 2012-2022



Source: Authors calculations from WITS Data

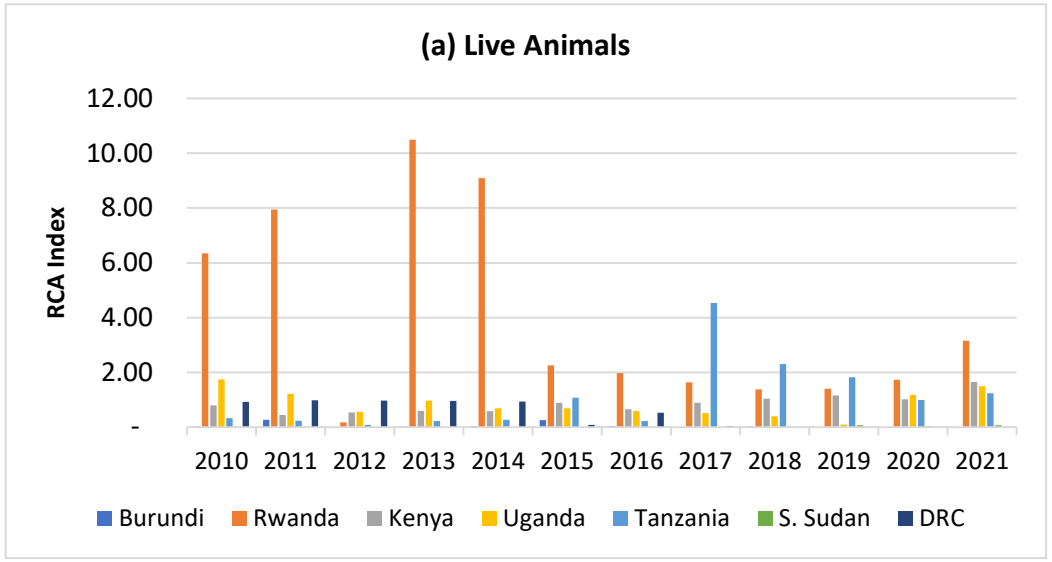
6.2.3 Revealed Comparative Advantage (RCA)

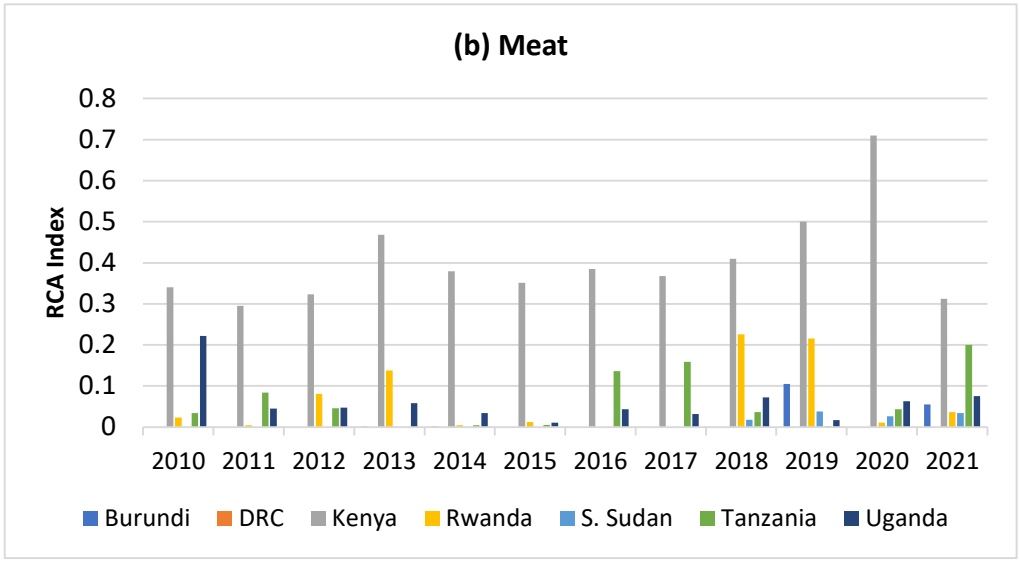
In terms of actual food products, 10 years ago, Rwanda was and still is best placed in exporting live animals with RCA ***(Figure 33a)*** **scores of 10.5 and currently 3.2, which is higher than of any other Partner State. In terms of actual meat products, none of the Partner States has comparative advantage despite Kenya being the best in the region compared to the rest with 0.31 (in 2021)** ***(Figure 33b)*****. Further look at animal products, specifically milk and milk products, Uganda seems to have a more specialized industry with a comparative advantage of more than 11 (year 2021), which has been consistent over the years. No other country comes close to Uganda in this sector, nor has this advantage.**

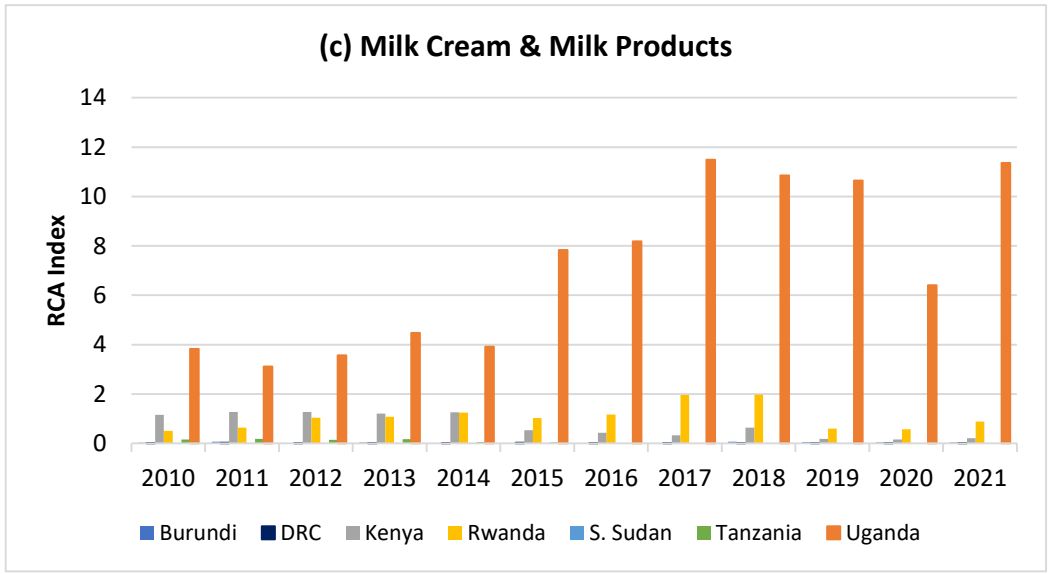
Fresh fish has also shown steady decline over the last 10 years of the top exporters in the region, Uganda (6.1) and Tanzania (3.2), but still of comparative advantage, with Rwanda emerging (3.4) as of 2021. Rice is also a well performing cereal with it being of best comparative advantage in Tanzania (38.5) and Rwanda (10.9) as of 2021, than any other Partner State with the former having this as their emerging crop of interest in the export market. A look into maize, Uganda has been a constant advantaged crop in the export market (8.4) despite a decline over the years, followed by Tanzania (7.0) as of 2021.

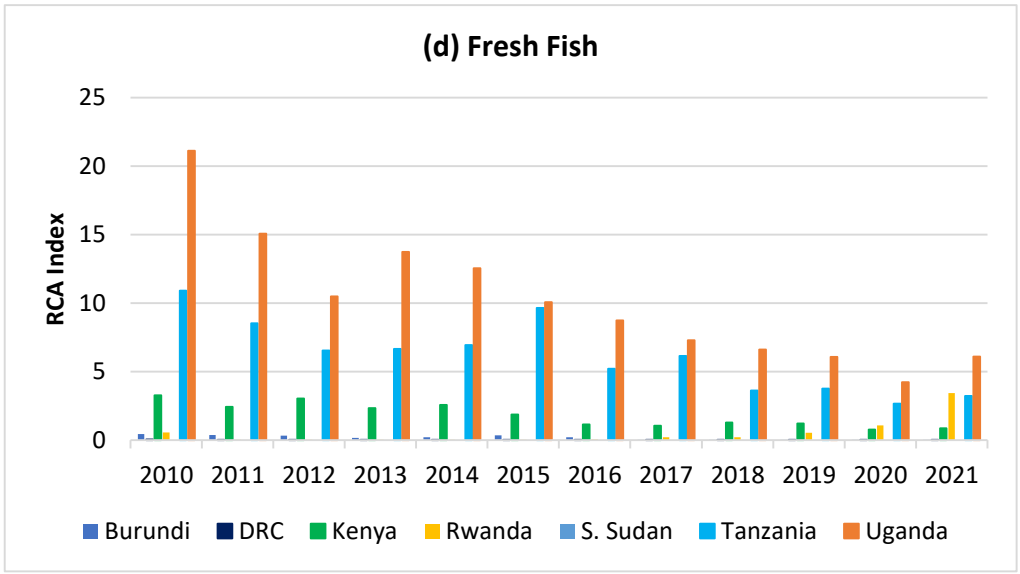
Vegetables give Kenya the highest advantage in the region over the years, with 15.2 in 2010, and currently 12.5 as of 2021. It is followed closely by Tanzania (11.2) and Uganda (5.3) as of 2021. Fruits and nuts used to be of high advantage to Tanzania, up until 2021 (4.6), when its closest rival Kenya (7.0) overtook it in the region. This is depicted in *Figure 33 (a-h)*.

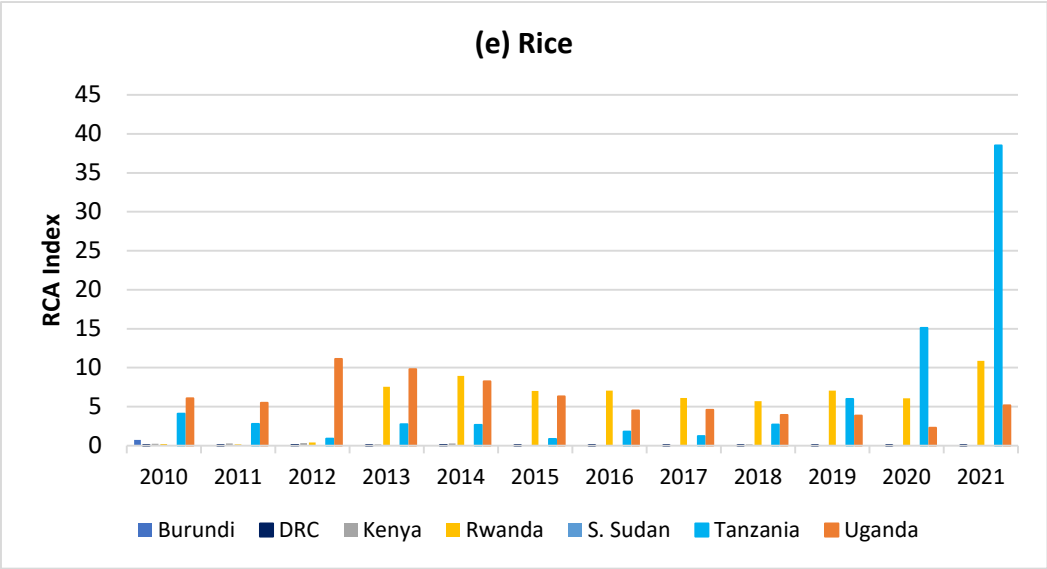
Figure 33(a-h): EAC Partner States Revealed Comparative Advantage in agriculture commodity groups, 2010-2021

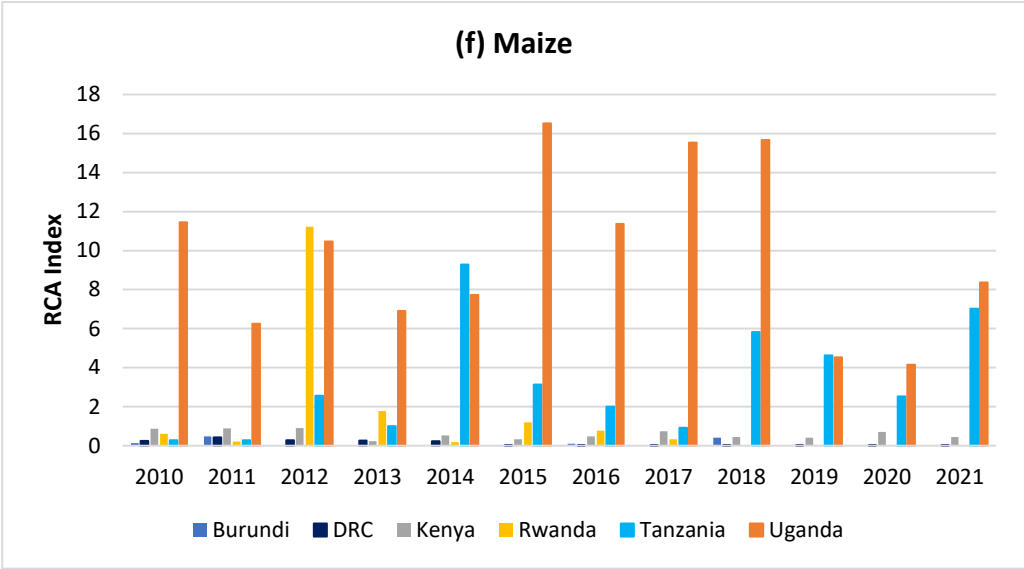


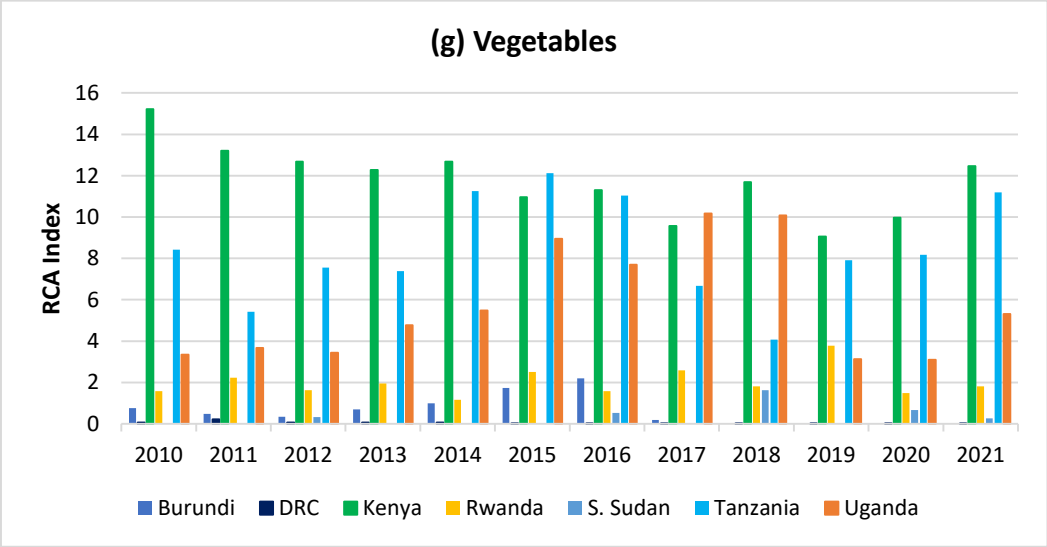


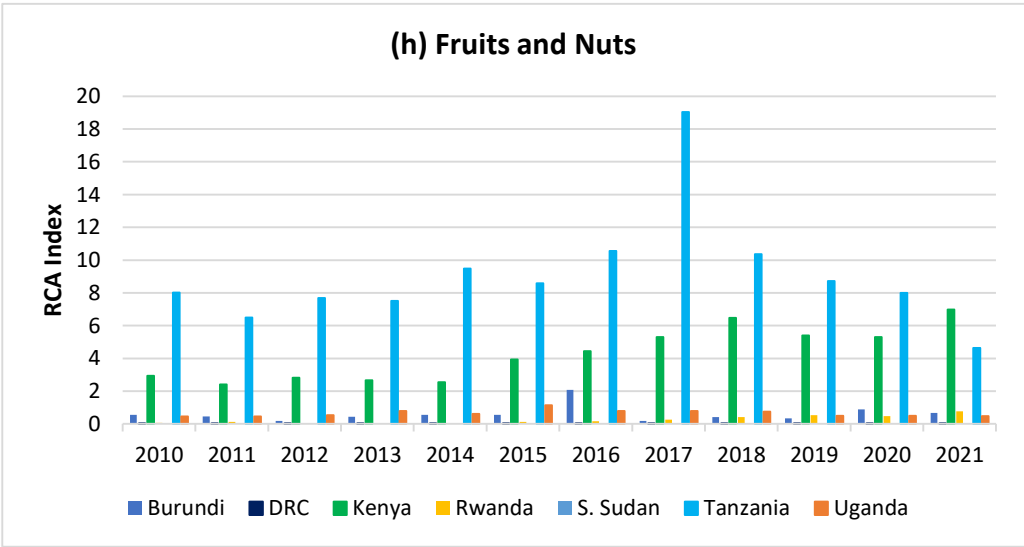












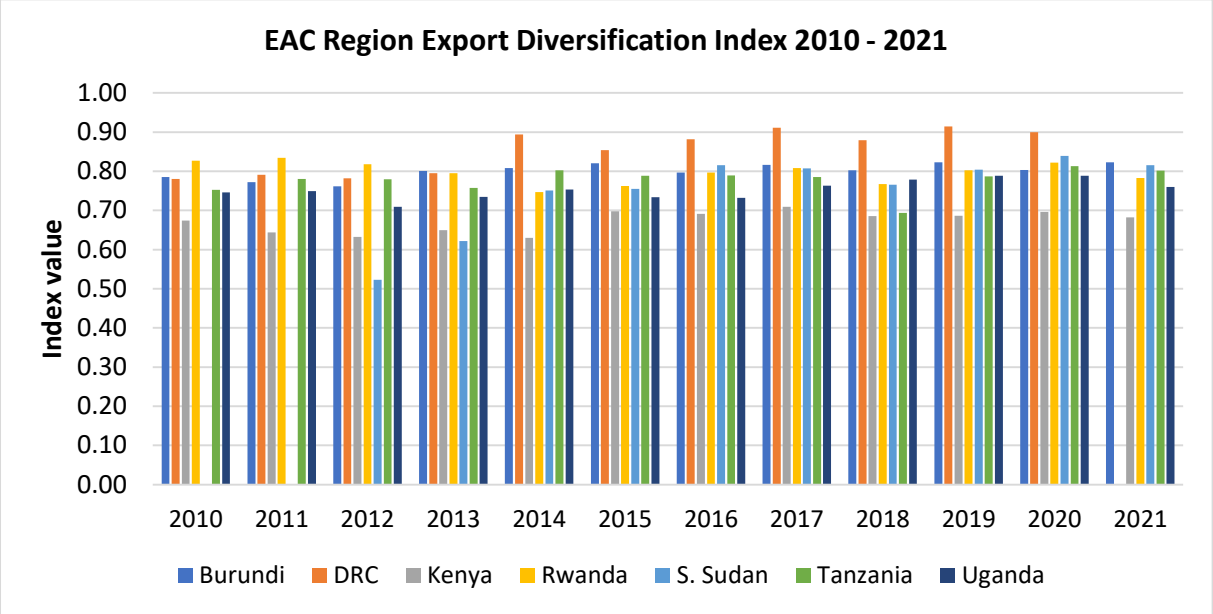
Source: UCTAD 2023. UNCTADSTAT

6.2.4 Export Diversification Index

A look at the export diversification index reveals the sectoral concentration of a region's exports to establish the trade patterns of a country. It tells us the degree to which a region or country's exports are dispersed across different economic activities. Values range from 0 to 1. A value of zero indicates that the export pattern exactly matches the world average. Higher values indicate greater dependence on a small number of products.

In the past, 10 years ago, Rwanda and DRC had higher scores on the diversification index than the other Partner States *(Figure 34)*, implying that the countries mainly depended on a small number of products for exports. Currently, DRC, Burundi, and South Sudan over-rely on a small number of commodities for export compared with Kenya and Uganda.

Figure 34: EAC Export Diversification Index 2010-2021



Source: Authors calculations from WITS Data

6.3 Performance in food security in EAC

6.3.1 Food security indicators

As observed from *Table 12* below, the EAC has made steady progress towards improving food security by registering positive growth from 2012. The region has also been affected by the effects of unprecedented levels of global shocks that have erased gains made in improving food security. Furthermore, the region is still susceptible to existing longer-term stresses affecting the global food system which include volatility in agricultural production, scarcity of natural resources and trade and supply-chain volatility.

Food insecurity in households is still an issue of national and regional importance as it touches on the all the dimensions of food security. While there has been a steady decline in food insecure households over time, Kenya and DRC have shown an increase over three- year time periods since 2014 and 2018 respectively, whereas Tanzania has not been steady. South Sudan, on the other hand, seems to suffer with the most severe forms of

food insecurity (above 60%), with minimal improvements since 2014. Uganda and Rwanda seem to be on the right path towards reducing severe insecure households since 2014.

Table 12: Food Insecurity Levels in the EAC 2014 - 2021 (%)

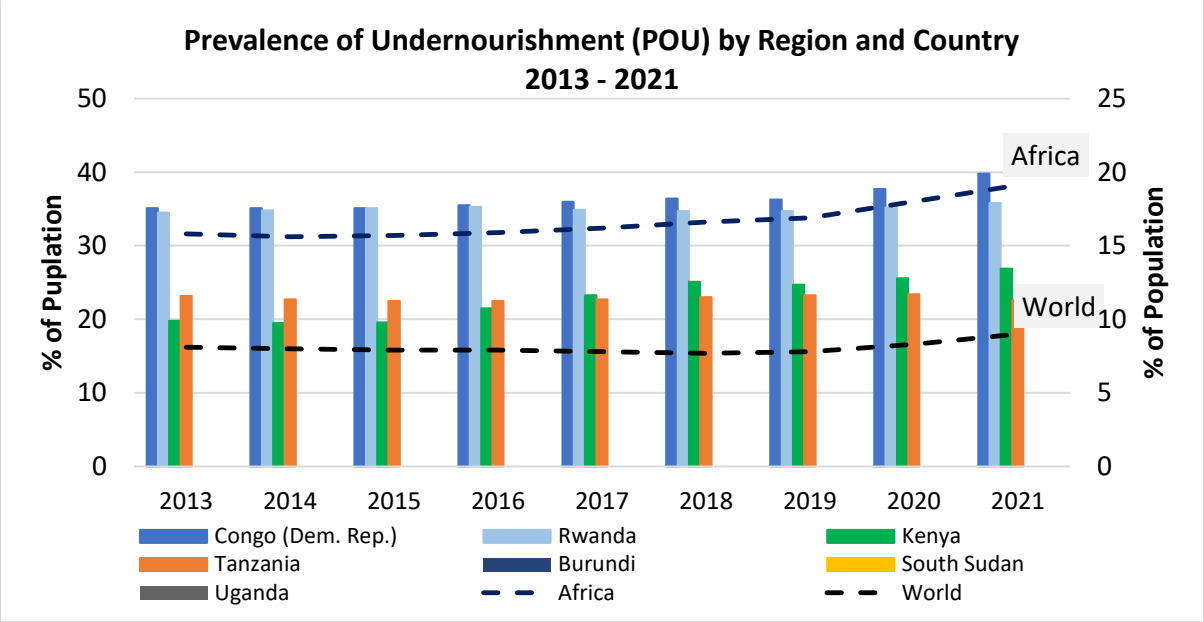
Country	Prevalence of Severe Food Insecurity				Prevalence of Moderate or Severe Food Insecurity			
	2014-2016	2017-2019	2018-2020	2019-2021	2014-2016	2017-2019	2018-2020	2019-2021
Burundi	-	-	-	-	-	-	-	-
Kenya	15.0	23.4	24.9	26.1	50.7	64.4	67.7	69.5
DRC	-	-	38.5	39.2	-	-	69.2	69.5
Rwanda	-	-	-	-	-	-	-	-
S. Sudan	-	63.7	63	62.3	-	84.9	85.7	86.4
Tanzania	20.6	25	24.4	25.8	48.8	56.1	56.3	57.6
Uganda	19.2	24.4	23.3	23.2	63.4	74.5	72.9	72.5

Source: FAO 2023. World Food and Agriculture Statistical Yearbook 2022

Another crisis is unfolding as this report is being written with potentially sobering implications for global food security and nutrition: the war in Ukraine. Although the statistics presented in this report represent the state of food security and nutrition up until 2021, the direct and indirect effects of the conflict in 2022 will have multiple implications for global agricultural markets through the channels of trade, production and prices. Ultimately, this casts a shadow over the state of food security and nutrition for many countries, in particular those that are already facing hunger and food crisis situations and poses an additional challenge for achieving the SDG 2 targets of ending hunger and ensuring access to adequate food for all (SDG Target 2.1) and of eliminating all forms of malnutrition (SDG Target 2.2).

Regionally, in East Africa, the Prevalence jumped in 2020 from 2019, driven by the pandemic, but remained relatively stable in 2021 *(Table 12)*. The economic crisis triggered by the COVID-19 pandemic led to widening the gap in employment, incomes losses, and access to food. These disparities in the impact of the pandemic and the recovery, together with the limited coverage and duration of the social protection measures, led to widening inequalities that are among the root causes of food insecurity. Thus, it is likely that growing inequalities in 2020 weakened the capacity of the Global and regional economic recovery to translate into increased food security, as is reflected in the growing number of people facing difficulties in accessing food. **DRC and Rwanda, of all the Partner States, experience the highest level of undernourishment, above the Africa and World averages (*figure 35*), with the latter showing slight improvement.**

Figure 35: Prevalence of Undernourishment in East Africa and the world 2013 - 2021 *(% of population)*

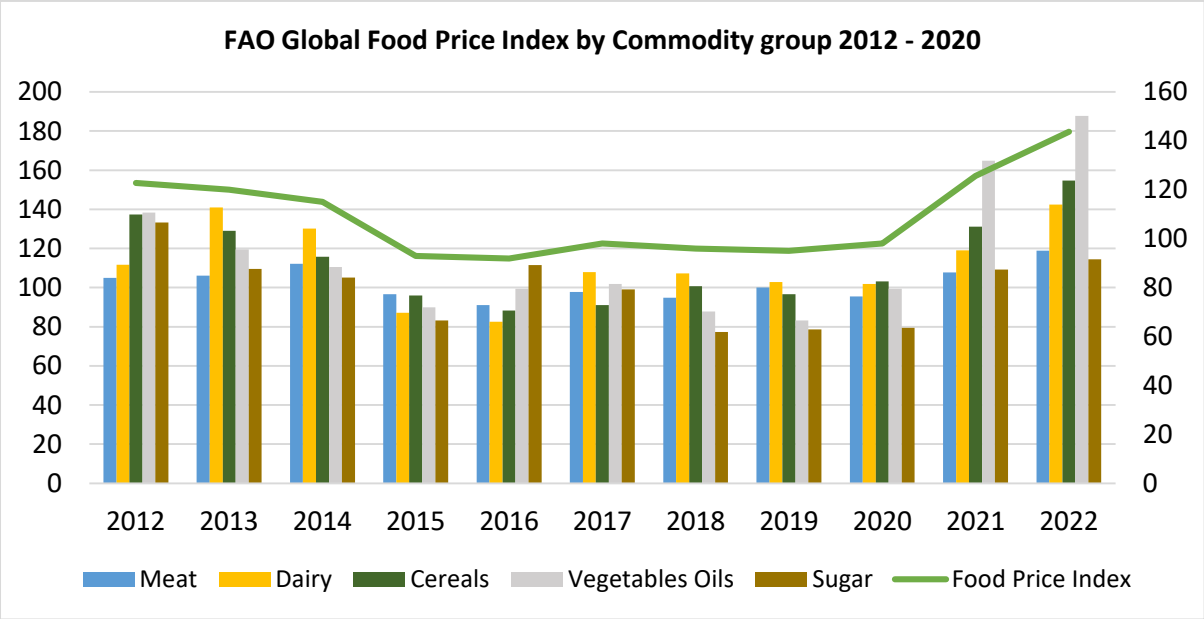


Source: FAO 2023. FAO The State of Food Security and Nutrition in the World 2022

Food Price Level Index

The highest food price is for vegetables and oils, followed by cereals, then dairy products, items which are largely consumed in households in the EAC. The prices reflect the challenges of climate change and the shocks from COVID 19 and Ukraine-Russia war. The cereal prices are generally high in comparison with the other food products. Despite large numbers of livestock, meat and dairy products prices remain elevated. Vegetable oils followed by cereals prices are highest compared to other foods (*figure 36*).

Figure 36: Global Food Price Index for major food commodities from 2012 -2022



Source: FAO. 2023. FAO Food Price Index

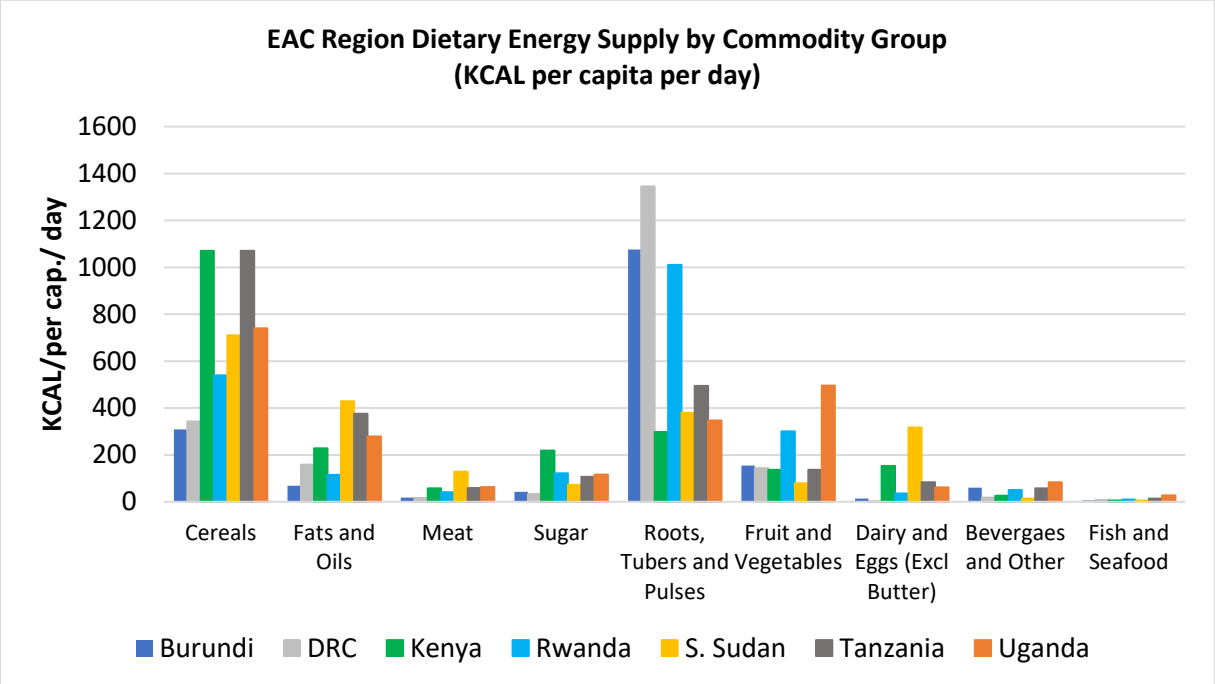
6.3.2 Status of EAC Dietary Energy Supply

In the EAC, the scenario is the same with cereals, tubers, and pulses forming the major food groups contributing the highest dietary energy supply. The food available for human consumption, expressed in kilocalories per person per day is the dietary energy supply. At the country level, it is calculated as the food remaining for human use after taking out all non-food utilization, including exports, industrial use, animal feed, seed, wastage and changes in stocks. In summary, it is the number of calories available for human consumption.

Dietary supply adequacy divides a country's average supply of calories for food consumption by the average dietary energy requirement estimated for its population, to measure the adequacy of food supply in terms of calories. Analysed together with the prevalence of undernourishment, it helps identify the cause of undernourishment as mainly due to insufficient food supply or particularly bad distribution.

To this end, Kenya and Tanzania seem to lead in consumption of cereals, whereas DRC, Burundi, and Rwanda lead in consumption of roots and tubers. South Sudan adequacy for food is highest in fats and oils, followed closely by Tanzania, whereas Uganda seems to be more sufficient in fruits and vegetables than any other Partner State *(Figure 37).*

Figure 37: EAC Region Dietary Energy Supply by Commodity Group, 2020



Source: FAO 2023. World Food and Agriculture Statistical Yearbook 2022

6.4 Status of source, demand, and trade in input costs

Fuel is either locally sourced or imported. The imports mainly constitute LPG and kerosene which are obtained from fuel stations, whereas locally available ones include charcoal and firewood. Due to variations in the prices of fuel, some countries such as Kenya have regulators who determine the fuel prices, which in most cases reflect the global prices, and in extreme

cases, put up subsidies to cushion the public from price fluctuations. Fuel is an important commodity in that it directly affects industries and transportation. An increase in fuel results in an increase in transport costs, which then leads to an increase in food prices. Further, this increase raises the cost of production in the value addition food chain.

The demand for seeds varies depending on the crop. Seeds are mostly imported or prepared by research organizations, then supplied by stockists of agricultural inputs, or by agriculture extension services. However, there are also those who rely on previous seasons' harvest; use for household consumption, sell some, and retain some for planting. This is common with pulses and tubers.

Freight has a great impact on food production and prices. Transport charges influence whether the harvested food will reach the intended markets. In addition, the type of transport network is determined by the policies of the area. On a Partner State level, landlocked countries tend to spend more on freight due to transit through other Partner States, and mostly use trucks which transit the major highways. Locally, there are middlemen traders who buy food at gate prices in the farms and sell them to major wholesale and retail markets, mainly in urban areas. **The inability to get an appropriate means of transport of produce from the farms leads to food loss and wastage.**

6.5 EAC Food and Nutrition Strategies and Frameworks

Under the Agriculture and Food Security Sector, EAC has strived to achieve food security, with a particular emphasis on agriculture, since most of its citizens depend on agriculture for their livelihood. Majority of the citizens, 80%+ are employed in the agriculture sector and who also engage in smallholder mixed farming of livestock, food crops (maize, rice, potatoes, bananas, cassava, beans, vegetables, sugar, wheat, sorghum, millet and pulses), cash crops, fishing and aquaculture (EAC, 2022).

Some of the frameworks under which food security is addressed are through the EAC Agricultural and Rural Development Policy (EAC-ARDP), the EAC Vision 2050, and EAC Agriculture and Rural Development Strategy (EAC-ARDS) as a follow up to the EAC-ARDS. The EAC Food and Nutrition Security Action Plan 2019-2023 builds from the Food Security Action Plan 2011-2015 looks to: Objective 1- To improve sustainable and inclusive agricultural production, productivity and trade of crops, animal and animal resources, fisheries, aquaculture, apiculture and forest products; Objective 2 - 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 and value addition; and Objective 3 - To improve access and utilization of nutritious, diverse and safe foods.

6.6 Policy measures impacting on food security.

6.6.1 Regional Policies

There are a number of initiatives that have been developed in order to address the food requirements of people addressing specific objectives. Some have been embraced at the country

level, while others remain at the regional level. Some have been adopted as a common voice for the entire African region, such as the Africa Common Position on Food Systems (ACPFS), which was presented at the United Nations Food Systems Summit (UNFSS) in 2021. The Africa Common Position on Food Systems feeds into the AU's Comprehensive Africa Agriculture Development Programme (CAADP) as a continental policy framework for agricultural transformation to increase food security and nutrition and reduce poverty. It is aligned to the 10 Year Implementation plan of Africa's Agenda 2063 (Goals 1,3,4,5, and 7) as well as to the UN SDGs Vision 2030 (Goal 2- End hunger, achieve food security and improved nutrition).

Other RECs of interest that have food security and nutrition strategies include SADC, IGAD, and COMESA. For instance, SADC has the SADC Regional Agricultural Policy and the Health Policy frameworks that address food and nutrition security. Further, these are addressed through the SADC Food and Nutrition Security Strategy 2015-2025. Previously was the Regional Indicative Strategic Development Plan (RISDP), 2003 which ran for 15 years. Most Partner States being part of COMESA are also subject to policies and strategies addressing food and nutrition. Examples include the COMESA Policy Framework for Food Security in Pastoralist Areas (PFFSPA) under CAADP Pillar III with a particular focus on vulnerable and food insecure pastoralists populations. In addition, the COMESA Medium Term Strategic Plan 2021-2025 looks into development of regional value chains through simplification of rules of origin, and the development of Small-Scale Cross Border Traders (SSCBTs) into the formal economy, sustainable development of the blue economy, among other things. On the other hand, IGAD is a member of the Food and Nutrition Security Community of Practice (CoP) in which there exists a space for online discussions by bringing together a pool of Nutrition experts in order to foster regional and continental synergies through the sharing of good practices (AUDA-NEPAD, 2023). Further, the IGAD Regional Strategy 2021-2025 Framework addresses food security and environmental protection and management of climate change variability.

It is therefore evident that food security issues are also at the heart of regional economic blocs (RECs); EAC not being an exception. The EAC Agriculture and Food Security Policy is one of the policies of the Treaty establishing the EAC in 1999, with Kenya, Uganda, and Tanzania as the pioneers. In addition, there are other programmes and policies that serve to enforce commitments made by Partner States in enhancing food security. Some of them include the EAC Agriculture and Rural Development Strategy (EAC- ARDS), EAC Agriculture and Rural Development Policy (EAC-ARDP), the EAC Food and Nutrition Security Policy (FNSP), among others.

Persistent food insecurity issues led to the EAC Heads of States Summit held in 2011 which directed the Secretariat to develop the 1st Food Security Action Plan (FSAP) 2011-2015. Later, another Plan, EAC Food and Nutrition Security Action Plan (FNSAP) 2018-2022 was developed to eliminate hunger, malnutrition and extreme poverty by 2022 whose immediate outcome included: improved agricultural production, productivity and incomes; improved trade and market access; increased farm and off-farm enterprise and job opportunities for youth

and women at all levels of the Value Chains; Strengthened disaster risk preparedness and management with sustainable utilization of natural resources and environmental conservation under the changing climate; Improved post-harvest handling, agro-processing and value addition; and increased investment in nutrition. Also, agriculture, food security, and rural development is anchored on the second pillar of the EAC Vision 2050 (Jane Otima, 2019).

Later on, an East Africa Food and Nutrition Security Strategy (FNSS) 2019-2023 was made so as to provide a unified approach to the implementation, coordination, and monitoring of the food and nutrition security programs at the national and regional level. The goal of the strategy was to contribute to elimination of hunger, malnutrition, and extreme poverty in the East African region by the year 2023.

Successful implementation of the Strategy was tagged on the alignment of national and regional interventions through policies; wide stakeholder consultations to encourage ownership; and technical and financial support.

Some countries have in place food trade policy trackers of their major foods in order to protect its food reserves amidst shortages over a given period of time. Some of these countries are displayed in the *Tables 13 and 14* below:

Table 13: Food Trade Policy Tracker (Major Food Commodities)

Jurisdiction	Measure	Products	Announcement	Expected end date
Afghanistan	Export ban	Wheat	5/20/2022	12/31/2022
Algeria	Export ban	Sugar, pasta, oil, semolina, all wheat derivatives	3/13/2022	12/31/2022
Argentina	Export taxes	Soybean oil, soybean meal	3/19/2022	12/31/2022
Bangladesh	Export ban	Rice	6/29/2022	12/31/2022
Burkina Faso	Export ban	Millet, maize, sorghum flours	2/28/2022	12/31/2022
Belarus	Export licensing	Wheat, rye, barley, oats, corn, buckwheat, millet, triticale, rapeseed, sunflower seeds, beet pulp, cake, rapeseed meal	4/13/2022	12/31/2022
Cameroon	Export ban	Cereals, vegetable oil	12/27/2021	12/31/2022
Georgia	Export ban	Wheat, barley	7/4/2022	7/1/2023
India	Export ban	Wheat	5/13/2022	12/31/2022
India	Export licensing	Wheat flour and related products	7/6/2022	12/31/2022
India	Export ban	Broken rice	9/8/2022	12/31/2022
India	Export taxes	Rice in the husk (paddy or rough), husked (brown) rice, semi-milled or wholly milled rice (other than parboiled rice and basmati rice)	9/9/2022	12/31/2022
Iran	Export ban	Potatoes, eggplants, tomatoes, onions	4/27/2022	12/31/2022

Jurisdiction	Measure	Products	Announcement	Expected end date
Kosovo	Export ban	Wheat, corn, flour, vegetable oil, salt, sugar	4/15/2022	12/31/2022
Kuwait	Export ban	Grains, vegetable oil, chicken meat	3/20/2022	12/31/2022
Lebanon	Export ban	Processed fruits and vegetables, milled grain products, sugar, bread	3/18/2022	12/31/2022
Pakistan	Export ban	Sugar	4/15/2022	12/31/2022
Russia	Export ban	Rapeseed	3/31/2022	2/1/2023
Russia	Export taxes	Soya beans	4/14/2022	8/31/2024
Russia	Export taxes	Sunflower oil, sunflower meal	4/15/2022	12/31/2022
Russia	Export taxes	Wheat, barley, corn	4/8/2022	12/31/2022
Serbia	Export ban	Corn flour, sunflower oil	3/10/2022	12/31/2022
Tunisia	Export ban	Fruits and vegetables	4/12/2022	12/31/2022
Türkiye	Export licensing	Poultry meat, eggs, vegetables, fruits	1/27/2022	12/31/2022
Türkiye	Export ban	Cooking oils	3/9/2022	12/31/2022
Türkiye	Export ban	Beef meat, sheep meat, goat meat	3/19/2022	12/31/2022

Source: World Bank 2023. World Bank Food Security Update (January 26, 2023)

Table 14: Food Trade Policy Tracker (Other Commodities)

Jurisdiction	Measure	Products	Announcement	Expected end date
Argentina	Export ban	Beef meat	1/1/2022	12/31/2023
Azerbaijan	Export licensing	Flour-grinding industry goods, starch, wheat gluten, oilseeds and other seeds, medicinal and industrial crops, feed	3/19/2022	12/31/2022
China	Export ban	Phosphate rock	9/28/2021	12/31/2022
China	Export licensing	Fertilizers	9/24/2021	12/31/2022
Lebanon	Export ban	Meat products, fish, potatoes, fruits and vegetables, oil, animal fat, ice cream, cacao, mineral water, milk	3/11/2022	No end date
Türkiye	Export ban	Beans, lentils, olive oil	2/27/2022	12/31/2022
Ukraine	Export ban	Nitrogenous fertilizers	3/12/2022	12/31/2022
Vietnam	Export taxes	Mineral fertilizers	5/6/2022	12/31/2022
Russia	Export licensing	Nitrogenous fertilizers	11/3/2021	12/31/2022

Source: World Bank 2023. World Bank Food Security Update (January 26, 2023)

6.6.2 Partner State Policies

Uganda considers agriculture as a backbone of the economy. Through the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), several projects have been launched to advance agriculture. The Agriculture Sector Strategic Plan (ASSP) 2015/16-2019/20 was responsible for implementing the continent's Comprehensive Africa Agriculture Development

Programme (CAADP), a growth oriented agricultural development agenda of the African Union (AU) and the New Partnership for African Development (NEPAD). Uganda's Vision 2040 of accelerating the growth of the economy through agriculture is driven by the ASSP. Other strategies and Plans include the National Development Plan (currently NDP III), Operation Wealth Creation (OWC), and the National Agriculture Policy. The OWC initiative complements efforts of the NDP and ASSP by bringing together policies, interventions, and programmes aimed at transforming agriculture from subsistence to commercial agriculture with a target of raising household incomes. The National Agriculture Policy is operationalized through the ASSP, and its strategic objectives are to ensure household and national food and nutrition security for all Ugandans; promote domestic, regional and international trade in agricultural products; promote specialization in strategic, profitable and viable enterprises and value addition through agro-zoning; among others. The Uganda Food and Nutrition Strategy and Investment Plan (UFNSIP) is a cross-sectoral national strategy that maps out a comprehensive framework for the eradication of hunger and malnutrition in Uganda. The design of UFNSIP is intended to assist the Government of Uganda in furthering its food, nutrition, and income security objectives under the Poverty Eradication Action Plan, the Plan for the Modernization of Agriculture and the Health Sector Strategic Plan in a concerted action and with support from development partners and stakeholders.

South Sudan has a number of food security policies. These policies are quite comprehensive but lack a coordination strategy to enable it function. Some of these policies include: Food and Agricultural Policy Framework (FAPF) (2006) which has ensured food availability through promoting improved agricultural practices; Animal Resources Policy framework (ARPF) (2006) though embraced at cabinet level, lacks time frame for implementation and budgetary allocation; Fishery Policy Framework (2006) which encourages protein uptake which lacks a baseline value for monitoring of the target of 150,000 tonnes per year; Transport Sector Policy (2007) which aims to link surplus areas to market centres through road network development; Trade and Industry Policy (2009) which proposes the promotion of marketing agricultural products through land conversion tax and that surplus food crops are sold to deficit areas while food deficit areas may sell other surplus resources such as (cattle) to other areas (USAID, 2018). The Agriculture Sector Policy Framework - 2012-2017 also set targets in doubling cereals production, increasing cropland, increasing crop yield, etc.

With 90% of the Burundi population relying on agriculture as a source of livelihood, the government has adopted various policies, strategies and frameworks to address food security issues. Vision 2025's National Development Plan (2018-2027) aims at changing the economy of Burundi by modernizing agriculture and attainment of food self-sufficiency. Further, within the NDP, the Burundi government in April 2021 adopted the National Program for the Capitalization of Peace, Social Stability, and the promotion of economic growth NPCP-SS-PEG. In addition, is the environment, agricultural, and livestock policy- DOPEAE 2020-2027. Other policies relevant to food security include: i) the multisectoral plan for food security and nutrition (2019–2023); (ii) national action plan (2017–2021) for implementation of United Nations Security Council resolution 1325 for women, peace, and security; (iii) national gender policy (2012–2025); (iv) action plan for youth employment (2021–2024); (v) national health

development plan (2021–2025); (vi) investment code (2008); (vii) national road map for strengthening food systems; (viii) national employment policy (2016–2025); (ix) national strategy for financial inclusion (Ministry of Agriculture and Livestock-Burundi, 2012). The implementation of these plans is by the Ministry of Environment, Agriculture, and Livestock (MINEAGRIE).

Rwanda's agricultural sector accounts for about 29 percent of GDP and employs about 72 percent of the population that is economically active. Rwanda's policies and expenditure decisions have supported its food and agriculture sector. Rwanda's Vision 2050 of attaining upper middle-income status by 2035 and upper-income status in 2050 puts emphasis on the importance of agro-processing and technology-intensive agriculture with a commercial focus, under its Pillar III: Transformation for Prosperity. Other relevant policies and plans addressing food security issues include the National Strategy for Transformation (NSTI 2018-2024) which replaced the Economic Development and Poverty Reduction Strategy (EDPRS 2013–2018); the National Agriculture Policy (NAP 2017–2030) which provides policy framework for a productive, green, and market-led agriculture towards 2030; Strategic Plan for Agricultural Transformation (PSTA4 2018-2024); and the Agriculture Sector Investment Plan (ASIP 2013–2018). In addition, there are other supporting frameworks, policies and plans such as: National ICT for Agriculture Strategy; National Fertilizer Policy; Land Husbandry, Water Harvesting and Hillside Irrigation Project; among others. It is important to note that the National Food and Nutrition Policy 2013 aligns itself to other EDPRS, with a particular emphasis on food and nutrition during pregnancy and the first two years of a child's life to avoid malnutrition in children (Ministries of Local Govt, Health, Agriculture, 2014).

Tanzania is a country that takes food security matters seriously. To back this statement, it has identified key policy areas relating to increase food crops production, encourage exports of food crops, improve systems to identify food insecure and vulnerable groups, hold adequate food grain reserves for emergencies through the National Food Reserve Agency (NFRA), and establish a transparent rules-based system for emergency food imports. The Tanzania Development Vision 2025 envisages a poverty free, food secure, and economic development in the rural areas in Tanzania. Improvements were made to the National Agricultural and Livestock Policy of 1997 to encourage private sector investment in basic commodity production and marketing as well as the supply of agricultural inputs. Further, the Agricultural Sector Development Strategy (ASDS) was rolled out in 2001 to guide on improved productivity and profitability and to increase farm incomes and thereby ultimately reduce rural poverty. Consequently, the Agricultural Sector Development Program (ASPD) 2006/7 – 2012/13 provided a framework from which the government structure would be guided on national and household food security. To further provide long term plans in the agricultural sector, the government of Tanzania partnered with Comprehensive Africa Agriculture Development Programme (CAADP) to formulate a ten-year plan, Tanzania Agriculture and Food Security Investment Plan (TAFSIP) in order to work towards the 6% annual growth in agricultural sector GDP. The National Agricultural Policy (NAP) 2013 was developed with the goal of developing an efficient, competitive and profitable agricultural industry that contributes to the improvement of the livelihoods of Tanzanians and attainment of broad-based economic growth

and poverty alleviation. Tanzania is currently implementing the Agricultural Sector Development Plan II, which is a ten-years programme that will be implemented in two (2) phases each divided into five-year implementation period whose strategy is transform subsistence smallholders into sustainable commercial farmers by enhancing and activating sector drivers and supporting smallholder farmers to increase productivity of target commodities within sustainable production systems and forge sustainable market linkages for competitive surplus commercialization and value chain development. The First Phase started in 2017/2018 – 2022/2023.

Kenya continues to hold agriculture in high regard due to it being a bedrock of the country in terms of employment and export. Kenya's Constitution of Kenya 2020, Article 23 states that every person has the right to be free from hunger, and to have adequate food and of acceptable quality. In line with the constitution are other policies and national development initiatives meant to foster agriculture and enhance food security. Kenya's Vision 2030 which was launched in 2008 provides a blueprint for the development of the country over the period 2008-2030. In its third implementation phase, the then President- Uhuru Kenyatta launched the Big 4 Agenda, meant to address, among other things, food security. The Agricultural Sector Transformation and Growth Strategy (ASTGS) 2019-2029 theme of Towards sustainable agricultural transformation and food and nutrition security in Kenya. The accompanying National Agriculture Investment Plan (NAIP) covers the first five of these years and has incorporated counties in shaping the strategy. This strategy aims at incorporating the private sector, accelerating farmer registration, creating market linkages for farmers through SMEs, etc. The National Food and Nutrition Security Policy Implementation Framework (NFNSP-IF) identifies all the key elements of national household food and nutrition security, such as access and nourishment of food as the drivers of overall nutrition and health. The ASTGS is linked to the NFNSP-IF in that it designs transformation around 3 key groups: i) small scale farmers, pastoralists, and fisherfolk households, local SMEs, larger business and agricultural markets that support them; ii) large-scale commercial farmers and eco-system of firms, domestic and export markets, and smaller farming communities that support them across the agricultural supply chain; and iii) Kenyans who are food insecure during emergencies and shocks all year round (MOALFI-Kenya, 2019).

The Democratic Republic of Congo (DRC) is among the most fertile land on earth with a potential to feed all its inhabitants and export the rest to the world. It has an arable land of 80 million hectares, and majority of its population, 65% +, living in rural areas and practicing farming (Musoko, 2022). The Democratic Republic of the Congo Country Strategic Plan (2021–2024) is meant to address food and nutrition security among other things. Persistent conflict, poor coordination, weak national capacity and exponential population growth present challenges to the achievement of zero hunger. Deep-rooted food insecurity and malnutrition are driven by poverty; diseases such as Ebola, measles and tuberculosis; and limited access to health services, education and livelihood opportunities that is underpinned by entrenched gender inequality.

6.7 Challenges to regional food security- Covid 19, climate change

Despite the resilient nature of citizens, several challenges continue to wreck the food systems of the region. Climate Change is a factor that has led to reduced food production due to the unpredictability of weather patterns. Most rural households who depend on rain-fed agriculture as a source of livelihood have experienced diverse weather patterns that have altered crop yields with resultant hunger and poverty. For instance, the recent drought situation in the horn of Africa has led to poor maize production in the region. Much as drought is a common situation, and so is flooding. Due to climate change, some seasons experience flooding, hence wiping off crops, hence leading to famine. Climate change is expected to put 38 million people in Africa at risk of hunger.

Limited adoption of yield-increasing technologies is another challenge experienced in crop production. Farming is usually practiced in the rural areas as a major source of household income. Therefore, any slight change in weather patterns can easily affect the yield, and consequently household income.

Lack of storage facilities even during bumper crop harvests renders harvest unusable. Furthermore, limited value addition shortens the shelf-life of most agricultural produce. Urbanization has caused many to move from rural areas to urban ones in search of job or business opportunities. In the process, many have abandoned their agricultural land, or traded them for profit. In the process, huge tracks of arable land have been bought by investors who convert them to residential plots or put-up residential buildings for sale. Consequently, **agricultural land diminishes**, and with the lack or weak policies on agricultural land, this continues to be a threat.

For a long time, rain-fed agriculture has been practiced through generations. It is rather clear the seasonal crops grown in different areas. Dependency on rain-fed agriculture has led to fluctuations in food production hence leading the region to be a net food importer. The **low levels of irrigation have also contributed to food insecurity in that seasonal crops may not be available off season, causing inflation, thus necessitating importation.**

The Covid-19 pandemic of 2020 caused a lot of disruptions in the agricultural food chain. The lockdowns imposed by many countries made it hard for most families to put food on their tables. The pandemic exposed the fragility of food systems which caused most people to be highly vulnerable. And with the lack of preparedness, this led to food shortages, especially in the urban areas which depend on rural food produce in the urban markets.

The infestation by locusts in 2019-2020 in the horn of Africa led to massive crop destruction in Kenya and Uganda, especially on maize. This led to reduced harvest of the crop in the said period. Despite the intervention of aerial spraying of pesticides, the locusts moved into new territories making it hard to control while destroying more crops.

The Russia-Ukraine war of 2022 led to severe disruption of the food supply chain. Ukraine being a major exporter of wheat made the commodity experience inflation along its value chain since the export market was interrupted.

The fall army worm (FAW) is a pest that damages leaves and stems of the major food crops in Africa, such as maize, sorghum, rice and sugarcane. Since the first incident spotted in Africa in 2016, in southern Africa countries, many countries in the region have fallen victims of the pest. In 2017, Uganda's central and western areas were infested by the pest, and it was estimated that up to 40% of maize had been damaged (Gro-Intelligence, 2017). Kenya and Tanzania have also been victims of the same.

Food Loss and Waste (FLW) has been caused by lack of a proper coordination between producers and the markets resulting in losses at the farms. Also, due to lack of proper storage facilities, food is lost in the farms, while some become susceptible to contamination (aflatoxin) rendering the harvest inedible. And with limited capacity for storage of grains and cereals at the national level, middle men end up exporting to other countries at high prices, yet purchase at low prices from farmers.

The vast arid and semi-arid land in Kenya and Uganda have not been adequately explored for purposes of irrigation to enhance food production.

Political instability in some parts of South Sudan, DRC, and banditry attacks in Kenya make certain regions unfit for agriculture productivity. This has a spiraling effect on food security.

6.8 Stakeholder views

There seems to be less information on the available policies on food security and nutrition from the stakeholders, and no information on the available price control policies. This is a cause for worry since in the absence of policies, or knowledge of the same, it becomes hard to popularize initiatives meant to boost agriculture. And from the desk review, there are few documents readily available, that talk about policies on food security despite the many initiatives that address food security.

Tanzanian and Kenya respondents agreed that there were price control policies/ laws in their countries that they were familiar with, while the rest of their counterparts in the Partner States had no knowledge of the same. This is contrary to the food policies which are widely known in all the partner states and to the specific foods they are attributed to.

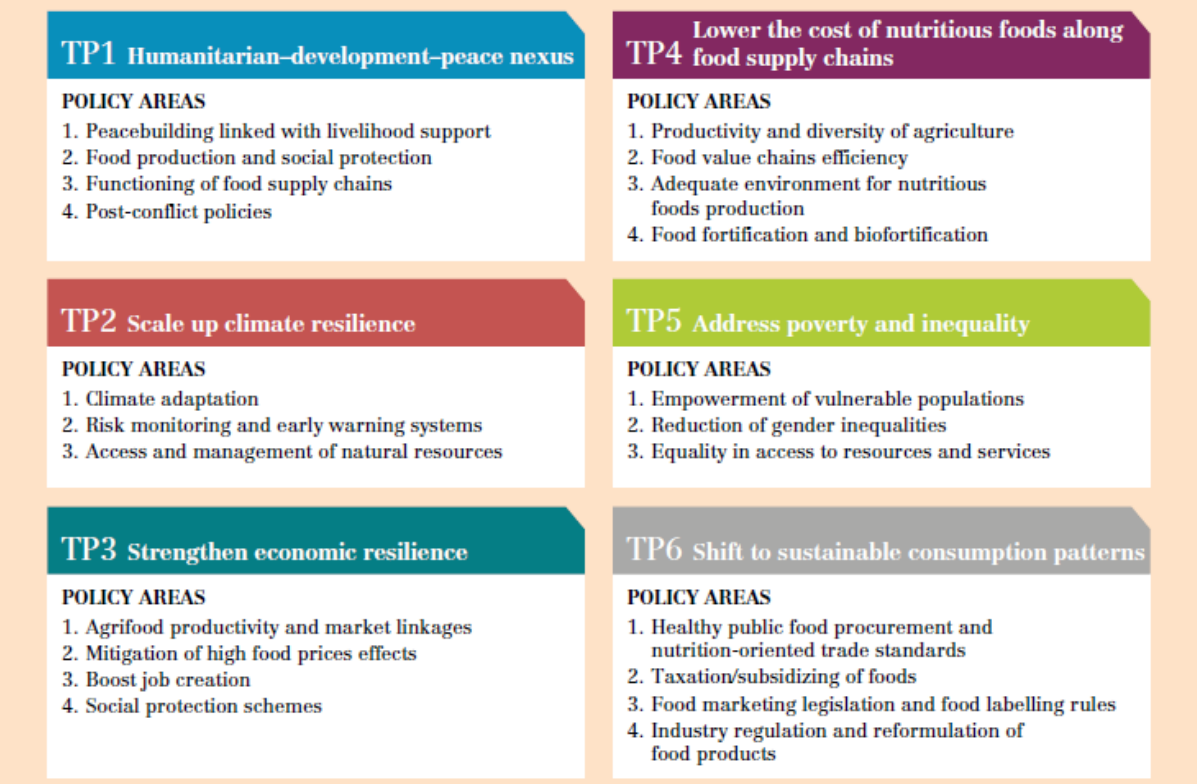
There seem to be dynamic changes in food security laws/ policies at the Partner State level thus hindering cross-border trade. This can be attributed to the prevailing political situation of two countries at a given time, thus affecting trade. There was less information on SPS measures which are country-specific, hence few traders are able to access cross-border markets.

6.9 Benchmark best practices

Some of the initiatives taken have been successful in reducing wastage, preventing losses, and enhancing the productivity of farmers and the trading community at large. The interventions proposed have proved effective and efficient in addressing food security through good practices. Policy-level interventions have had a lasting effect on households, businesses, farmers, etc. The interventions that have had positive results include i) ***investing in agricultural productivity, particularly among smallholder farmers; ii) improving the quality of and access to nutritional food; iii) protecting and enhancing the environment while improving agricultural productivity; iv) supporting technological innovation that is applicable and accessible to poor farmers; and iv) reducing commodity price volatility.***

In the course of identifying country-specific interventions to be considered success stories, an important aspect that comes into play is the country context where a combination of policy tools has stood out. There had been several cross-sectional actions and objectives across multiple transformative pathways that relate to the African context, as well as the latest developments. Particularly, these practices are implemented in countries that are affected by: i) climate extremes; ii) climate extremes in conflict or post-conflict settings; iii) and economic slowdowns and downturns, with a special focus on the COVID-19 pandemic; all of which apply to one or more East African countries. TP4, TP5 and TP6 cut across most of the policies primarily identified under TP2 and TP3 as shown in *Figure 38* below.

Figure 38: The six transformation pathways and a selection of key policy areas



Source: UNFAO, 2022

The key highlights of these policies intertwined revealed the following tried and tested interventions.

i) **Investments stemming from climate funds, where the budget for interventions is channeled directly to communities, effectively improve local food value chains, and increase the resilience of vulnerable populations to climate and economic shocks.**
ii) **Extension tools have proven helpful along all transformative pathways since they improve agricultural practices and market linkages in communities, as well as knowledge about nutrition, hygiene, maternal and childcare, and food preservation techniques.**
iii) **Consistent financial resources are needed in conflict settings, not only to ensure food security in the short term but also to tackle the root causes of crises and to guarantee the functioning of food value chains in the long term.**
iv) **Cash transfers combined with nutrition education in fragile or conflict settings, especially in areas that are affected by climate extremes, have positive impacts on maternal and child dietary diversity and nutrition and decrease the probability of children being diagnosed with moderate or severe acute malnutrition.**
v) **The use of digital technology employed during the COVID-19 pandemic improved the efficiency of food value chains, and promoted transparency and linkages among value chain actors while social protection measures directly targeted to children's households during school closure improved access to nutritious foods for children and their families.**

One such country where intervention proved successful was Somalia. Despite the political instability, violence, drought, and heavy flooding which led to largescale food insecurity affecting more than 6 million people, and malnutrition to over 900 000 for children under 5-year-olds; the Cash + project was launched by FAO in 2018 with support from the World Bank. This project ensured cash was readily available, agricultural input as well, training, etc. in order for the citizens to diversify their livelihoods. Further, interventions targeted areas with high rates of malnutrition, female-headed households, households with pregnant women, and those with children under the age of 5. Pastoralists and farmers received cash to enable them purchase food in order to ensure access to nutritious foods. This was in response to strengthening resilience to climate variability and extremes in a conflict area.

Another success story emanates from South Sudan, a beneficiary of the FEED project by World Vision, Oxfam, and Care. Its goal of boosting agricultural productivity by integrating innovative and sustainable agricultural practices with a gender equality focus was meant to address the gender disparity in agriculture which mainly targeted women who, culturally, were not allowed to eat nutritious foods, had less access to credit and agricultural extension services. The deep-rooted cultural norms shape gender-based discriminatory behaviour leading to early marriages so as to raise funds to provide food security. Therefore, FEED has addressed this through partnering with local leaders and government officials to provide agricultural inputs, livestock, developing market for community produce, offering training on post-harvest activities and other income generating activities, and establishing producer and marketing groups. FEED also established farmer training schools where farmers are taught innovative agricultural practices, conservation, etc.

Fiji is a country in the pacific island. It may not be relatable to most African countries in terms of natural disasters, but it is a country whose government showed preparedness in handling emergency cases without compromising its food value chain. Despite having been faced with many natural disasters such as cyclones and other natural disasters, Covid-19 hit them hard, just like in many countries. In response to this challenge, the government, through the Ministry of Agriculture, on realizing the gravity of the situation, went ahead to initiate two major strategies to ensure that food security of its people was guaranteed; one in urban and peri-urban areas, and in rural areas. The former took up the "Home gardening program", while the latter "Farm support package". Ministry of Agriculture provided gardening seed packages to all households in urban and peri-urban areas around Fiji, as well as agricultural extension services provided seeds to those that filled the Agriculture COVID-19 Response Form. This was meant to address the urban dwelling residents who mainly depended on imported food and were on the verge of losing their jobs due to Covid-19. On the other hand, rural areas received planting materials, open-pollinated seeds, and suckers; this was restricted to them that had ¼ acre per crop for 3 short term crops, mainly; for cassava, rice, okra, tomato, peas and other crops of importance (Randin, 2020).

A multi-sectoral approach to addressing food security is also necessary in ensuring food availability, increase in yields, diversity in the value chain, and such like ventures. One such success is the Agenda for the Transformation of Agriculture in the Democratic Republic of Congo (ATA-DRC) which is part of the larger National Agricultural Development Program (PNDA) with funding from the World Bank. This initiative brought together stakeholders in the public sector (Ministry of Agriculture (MINAGRI)), private sector (Bio Agronomic Business (BAB)), research institutions (International Institute of Tropical Agriculture (IITA)), local partnerships (Centre de Recherche en Agrumiculture (CERAGRU), Les Plantations et Huileries du Congo (PHC), etc) and funders. The key priority areas of the program were to enable immediate impact: establishing an Enabling Environment; improving seed systems; improving production systems; accelerating value addition; transforming agri-business development; Advancing Mechanization and Agricultural Engineering and establishing a Robust Management and Coordination Structure. Particularly, emphasis was on the revival of the cassava, corn, rice, soybean, and bean seed sectors and capacity building for agricultural authorities set up by Agricultural Voluntary Program (PVA). Consequently, the first phase, 2022-2023, has seen tremendous progress registered in line with its priority areas. Some of the successes include the seed sector which recorder rapid multiplication of healthy cassava seedlings using Semi Autotrophic Hydroponics (SAH) technology; produced 600,000 cassava seedlings from 30 ha for transplanting; purchasing of 60 tons of maize seed for supplying to Mongata and Nkuadi agricultural camps; and partnership with Les Plantations et Huileries du Congo (PHC) for intensive rice, maize, cassava, and soybean seed production. Further, 20 large bakeries making bread using high-quality cassava flour (HQCF) (IITA, 2022).

PART V: WAY FORWARD

7.0 STANDARD NUTRITIONAL REQUIREMENTS

7.1 Food Clusters

In order to meet the standard nutritional requirements, it is important to understand that food has different classifications, with the highly nutritious ones carrying more weight than the others. Using the Food Consumption Score (FCS)[7], it is possible to determine the household level requirements of food that can then be projected to the country level in order of their importance. FCS aggregates household-level data on the diversity and frequency of food groups consumed over the previous seven days, which is then weighted according to the relative nutritional value of the consumed food groups. Of particular interest in the study is the weight attributed to foods of interest. Therefore, the FCS will not be used to determine whether a household food consumption is poor, borderline, or acceptable, but rather the weights will be used to determine nutritional dense foods, which will help in making recommendations to the Partner States. It is also noted that calorie intake depends on gender, weight, age and height[8].

Below is the weighting borrowed from the FCS computation. From the cluster, it is evident that animal products carry more weight (**milk, meat, fish** weight of 4) whereas spices and oils and sugar the least *(Figure 39)*. In addition, vegetables and fruits carry a weight of 1 whereas the staple foods of Partner States, mainly cereals and pulses weigh 2 and 3 respectively. It is worth noting that pulses carry more nutritional weight than cereals and tubers (Vhurumuku, 2014). Therefore, it is important to have this in mind when considering alternative foods.

[7] Servings in ratios of 10 ounces grains; 2.5 cups of fruits; 3 cups of dairy; 7 ounces of proteins

[8] Men require daily minimum of 2500 calories but not less than 1500 calories while women require a minimum of 2000 calories but not less than 1200 calories.

Figure 39: Food Clusters and their weights

Food Group	Food Items belonging to group	Food groups	Weight for FCS
1. Cereals and grain:	Rice, pasta, bread / cake and / or donuts, sorghum, millet, maize,	1.Cereals and Tubers	2
2. Roots and tubers:	potato, yam, cassava, sweet potato, taro and / or other tubers		
3. Legumes/nut:	beans, cowpeas, peanuts, lentils, nut, soy, pigeon pea and / or other nuts	2. Pulses	3
4. Orange vegetables (vegetables rich in Vitamin A):	carrot, red pepper, pumpkin, orange sweet potatoes,	3. Vegetables	1
5. Green leafy vegetables:,	spinach, broccoli, amaranth and / or other dark green leaves, cassava leaves		
6. Other vegetables:	onion, tomatoes, cucumber, radishes, green beans, peas, lettuce, etc.		
7. Orange fruits (Fruits rich in Vitamin A):	mango, papaya, apricot, peach	4. Fruit	1
8. Other Fruits:	banana, apple, lemon, tangerine		
9. Meat:	goat, beef, chicken, pork (meat in large quantities and not as a condiment)	5. Meat and fish	4
10. Liver, kidney, heart and / or other organ meats			
11. Fish / Shellfish:	fish, including canned tuna, escargot, and / or other seafood (fish in large quantities and not as a condiment)		
12. Eggs			
13. Milk and other dairy products:	fresh milk / sour, yogurt, cheese, other dairy products (Exclude margarine / butter or small amounts of milk for tea / coffee)	6. Milk	4
14. Oil / fat / butter:	vegetable oil, palm oil, shea butter, margarine, other fats / oil	7. Oil	0.5
15. Sugar, or sweet:	sugar, honey, jam, cakes, candy, cookies, pastries, cakes and other sweet (sugary drinks)	8. Sugar	0.5
16. Condiments / Spices:	tea, coffee / cocoa, salt, garlic, spices, yeast / baking powder, lanwin, tomato / sauce, meat or fish as a condiment, condiments		

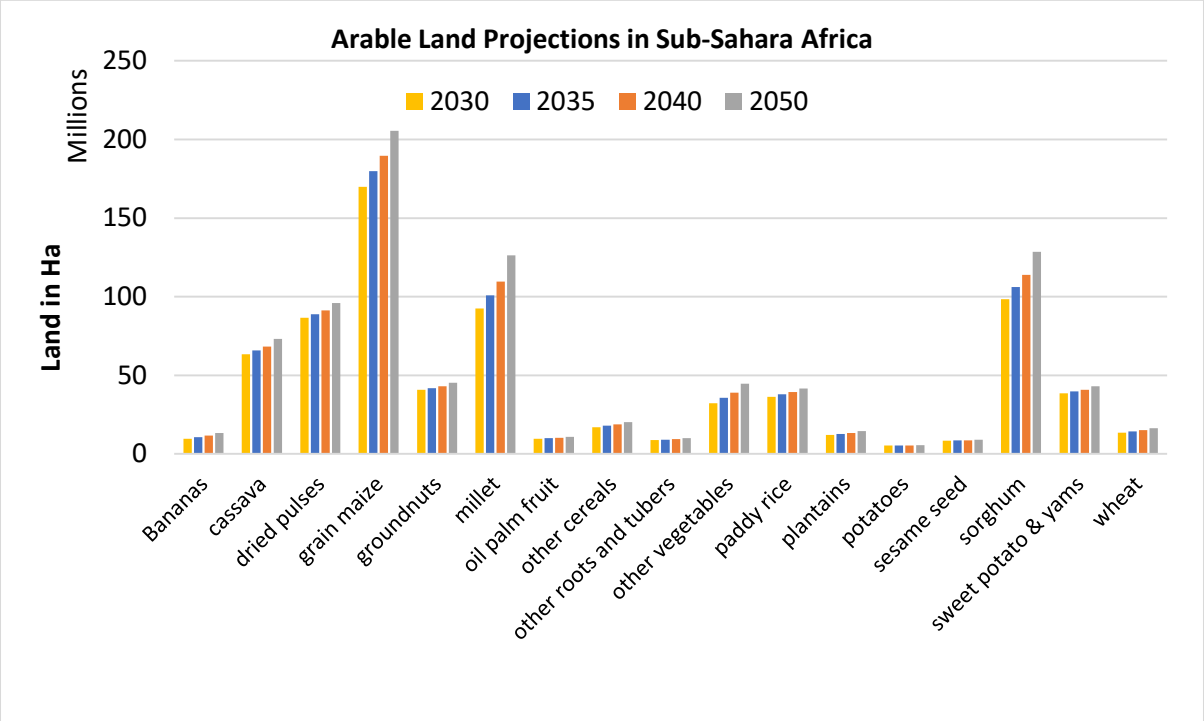
Source: Food Security Indicators, 2014

7.2 Land Allocated to Food Crops

Amidst food insecurity, there is a need to understand the dynamics of a country in order to make projections on their common foods. The reason behind this is to be able to move the country towards sustainability. Majority of the Partner States belong to Sub-Saharan Africa; hence the projections are based on a 5-year to 10-year series towards sustainability. In addition, the food mentioned is those that are common among Partner State.

It is evident that the **greatest land for crops is allocated to maize grain followed by sorghum and millet in Sub-Saharan Africa.** This is expected to last for years since they are staple foods in most countries. **The acreage in cassava and dried pulses is expected to increase with the introduction of high-yielding varieties, better quality**, disease tolerant ones. On the other hand, there will be limited acreage allocated to bananas, potatoes, and other root tubers since in most instances, they are intercropped with maize or sorghum. This is further depicted in *figure 40* below.

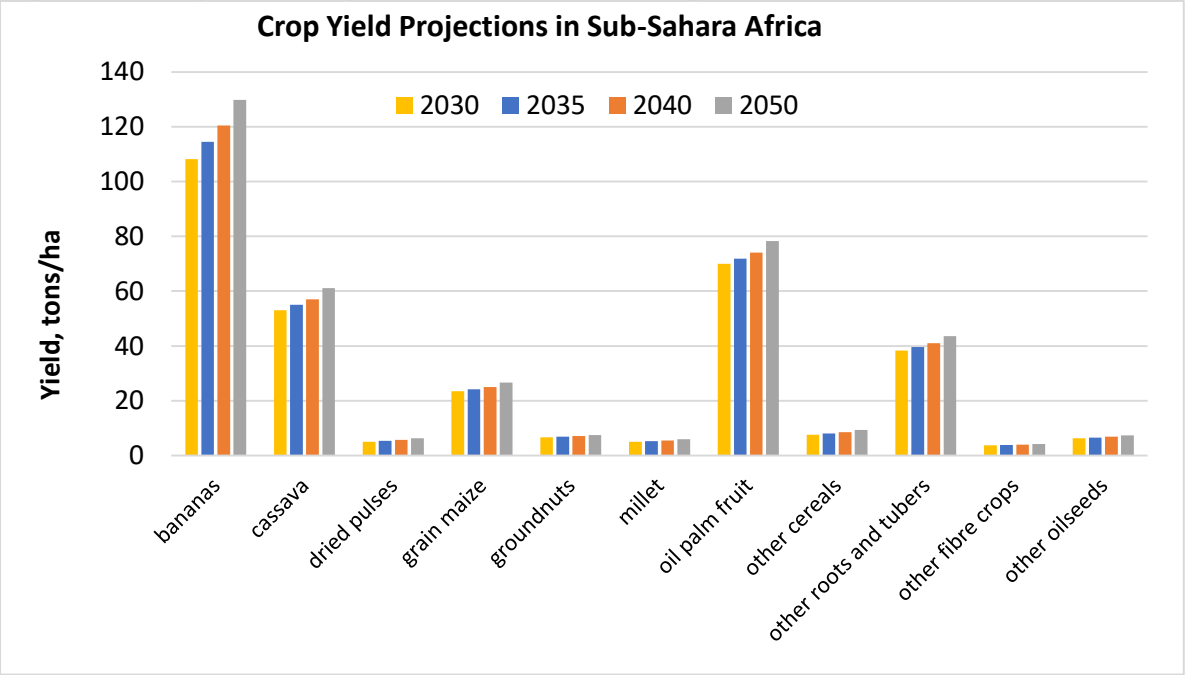
Figure 40: Projections of arable land for crops in Sub-Saharan Africa



Source: FAO Projections Data Portal

Despite the small, allocated acreage to bananas, their yield is expected to be highest, alongside cassava, oil palm fruit, and roots and tubers. It is projected that yield from fibre crops will remain low over the years as well as for dry pulses. In order to maintain sufficient nutrition, it will be therefore important to consider livestock products in order to balance the cereals which are considered staples. *Figure 41* below illustrates this further.

Figure 41: Projections of yield on selected food crops in Sub-Saharan Africa



Source: FAO Projections Data Portal

8.0 MITIGATION MEASURES

8.1 Background

In order to entrench food availability, local innovations complemented with incentive schemes, have to be prioritized to create substitutions and diversification options of selected regional food products against major food import products; to overcome producer challenges to create opportunities for both Micro Small Medium Enterprises (MSME), youth and women, and large companies engaging in value addition and processing of grains, edible oil, fertilizers and major staple food in the region. It will also be critical to invest in institutional strengthening and capacity building for the different players to synergize in exploiting available diverse markets.

8.2 Food Import Substitution

The EAC can take lead in encouraging import substitution by encouraging Partner States to subsidize the cost of production for key food imports and hedge against future bans; subsidize manufacturing to expand value addition and diversify food baskets; increase taxation for food outside the EAC FTA to facilitate competitiveness in the initial stages; encourage other protectionist policies on their local producers; among others. Import substitution provides an opportunity for the private sector to grow.

In order to determine the imports to be substituted, it is important to look at the demand for the food against locally available options. Due to the fluctuations in food prices occasioned by the Russia-Ukraine war, Covid-19, and climate change, it is important to have options that are readily available, and preferably in the same food clusters. For instance, the price of wheat soared to an all-time high with the onset of the Russia-Ukraine war thus affecting the value chains of the largest producers of wheat globally- Ukraine. **The wheat value chain can be substituted with millet, rice, sorghum, cassava, yams, etc since they belong to the same food cluster and are locally available, requiring less processing.** Consequently, the demand for wheat will decrease, and possibly the local wheat production can meet the needs of the Partner States as jobs are created along these value chains. Further, the food loss and waste resulting from excess harvest, poor handling, and other reasons can be contained due to availability of a huge market for the substitute foods.

Food can also be substituted by encouraging the local producers to increase production of foods at subsidized prices so as to avoid overreliance on imports. For instance, palm oil is largely imported in most East African countries. As a measure to encourage the prices to go down, **companies dealing with oil manufacturing can receive tax exemptions to encourage investment in the sector.** Consequently, prices of cooking oil will go lower and make it affordable for households. An example where import substitution is working in Kenya is in the Kwale International Sugar Company where in 2017 alone, it produced 28,000 tonnes of sugar from the 290,000 tonnes of sugarcane that it harvested since it operated across the production chain thus reducing on sugar importation (African Business, 2019). Further, the company improved Kenya's trade balance by exporting half of the sugar it produced.

Food is also substituted using more nutritious ones. **It is important to fortify foods while substituting them to ensure that they accord the same, if not better nutritional value**. This

will ensure that the substitution strategy is not a downgrade, but rather a way of enhancing food production along value chains as well as enhancing food security.

8.3 Local Innovations

There has been progress made towards innovations in the food production systems in Africa. Innovation-driven food systems can contribute to Goal 2 on food security and poverty alleviation while meeting Agenda 2063 and other EAC policies on food security through productive agricultural systems with resilience to climate change, value addition enablement, among others. In addition, it involves the change of perception of agriculture as a rural way of life to transform it into business.

There exist some initiatives such as **BioInnovate Africa** which strengthens bioscience in value addition to food production and agricultural waste. On the other hand, the use of mobile app in Uganda, Kenya, and Rwanda to trade and monitor the distribution of disease-free sweet potato vines from tissue culture labs to farmers' fields has proven effective in detecting infected plants along the supply chain (Rylander, 2018).

More research needs to be conducted on orphan crops[9] such as sorghum and millet to increase yield and for the socio-economic empowerment in marginalized communities in East Africa as they are staple foods. This will help provide gluten-free high mineral food products for persons with special dietary needs. In addition, they are resilient to the effects of climate change.

Through the Technologies for African Agricultural Transformation (TAAT) Project of 2018 launched by AfDB for Kenya, Uganda, Tanzania, Rwanda, and 7 other countries, the *Maize Compact* which is of high-yield, climate-smart variety was released. In addition to this, TAAT Maize project worked with 34 women groups in Kenya to adopt technology (Muthie, 2021).

Hydroponics technology has been widely used in urban areas of Kenya and recently Uganda. It involves planting crop in nutrient-rich water, without soil present. Vegetables are mainly grown under this set up. This can offer a good solution to urban areas which on food production, unlike rural areas, where land is mainly vast.

There has been new development in the staples' value chains with the conversion of yams, cassava, sweet potato into flour, which is blended, and packaged for sale. They are then used in bakeries to prepare gluten-free bread, cakes, and such kind of foods which are highly nutritious, thus providing alternatives to wheat products. This should be encouraged as it creates alternative foods in the respective value chains.

[9] Orphan crops are local crops that are not internationally traded and tend to be overlooked in agricultural research

It is also expected that the use of climate-smart agricultural technologies will go a long way in boosting food security. One such innovation is hydroponics technology whereby plants are grown in nutrient-rich solution in a water solvent. This is particularly useful for vegetables, thus ensuring that there is balanced food at all times in homes. This value chain involves training opportunities, local market trading, and also the export market.

LOCAL INTERVENTIONS AND DIGITILAZATION IN AGRICULTURE

- Facilitating adoption of new technologies. For example, producer organizations can promote digital pest management technologies, distribution of climate-resistant seeds, and climate adaptation training. Resource pooling allows these organizations to reach remote farmers and marginalized communities, who are especially vulnerable to climate change. The international community can also help by facilitating technology transfer and know-how shared with producer organizations as well as other stakeholders.

- Scaling up food production and distribution. Producer organizations can reduce market and information asymmetries and leverage economies of scale (by aggregating members' production) to negotiate lower input costs, affordable storage facilities, higher margins on product sales, more reliable distribution chains, and reach new markets—all benefiting farmers' profitability and ability to expand production.

- Machine-learning combined with satellite connections enabled Kenyan farmers to fight severe locust swarms in 2020. The Food and Agriculture Organization of the United Nations (FAO) estimates these efforts saved 34 million livelihoods and averted losses amounting to $1.5 billion throughout East Africa. Technology firms such as Plant Village in collaboration with the United Nations and FAO applied satellite connections and machine-learning ground teams to record images. This helped identify maturity and project swarm movements with up to 90 percent accuracy. Advice was disseminated to nearly 14 million farmers weekly through Shamba Shape and Mercy Corps. Plant Village also uses mobile spectrophotometry to allow farmers to gain insight into crop health of cassavas.

Source: IMF Climate Change and Chronic Food Insecurity in Sub-Saharan Africa, 2022

8.4 Food Reserves

There is an increasing need to have adequate amounts of food stored or preserved to cushion the population against extremes that come with bumper harvests going to waste during famine, crises, and flooding. This has been the case with mainly cereals in Partner States where silos store grains, mostly maize, which is bought from farmers and serve as national grain reserves. When there is a dip in food production, millers buy these grains at a subsidized price in order to cushion the public from inflation in food prices.

This should be encouraged at household level. Traditionally, granaries have been used to store maize, cassava has been dried and then converted to flour, beans have been dried and treated in order to last longer. Other ways to preserve foods, especially nutrient rich ones, need to be explored and adopted at household, country and regional levels.

8.5 Expanded intra-regional trade in food

Partner States need to allow for emergency exportation to other members in cases where there is a shortage in a particular State. This is because drought may not affect all the Partner States at the same time. This will allow the surplus of other States to be exported to the other members without trade restrictions. **This may involve temporarily suspending the export ban to meet the needs of fellow Partner State.**

In the context of climate change, greater regional trade integration can enhance food availability and affordability. Combined with resilient storage and transport infrastructure (for example, better coverage and quality of roads, train lines, and ports), it can facilitate sales of one country's bumper harvests—that may have gone to waste—to a neighbouring country facing shortfalls.66 In turn, prices in both countries will remain stable, incentivizing longer-term agricultural investment. By the same token, **increased regional trade could open new markets for farmers and agri-businesses and contribute to developing production networks and value chains across SSA.67 The resulting knowledge transfers, including for adaptation (for example, optimizing drought-resistant crops, best-suited equipment for a given terrain and training on its use, energy-efficient agricultural practices), as well as the competition could boost productivity.**

Greater regional trade integration and resilient transport infrastructure enable sales of one country's bumper harvests to its neighbours' facing shortages. **Tariff reduction and regional alignment of agricultural and product market laws and regulations (especially with respect to water, seeds, and fertilizer) will all be elemental**. Expansion of producer organizations can facilitate adoption of new technologies, scale up food production and distribution, and support price stability

8.6 Budget Support

Fiscal policies focused on social assistance and efficient public infrastructure investment can improve poorer households' access to affordable food, facilitate expansion of climate-resilient agricultural production, and support quicker recovery from adverse climate events. **Critical infrastructure areas include irrigation systems, telecommunications, transport, storage facilities, and renewable electricity. In cases where agricultural subsidies are present, the subsidies should be redesigned to ensure better targeting and reduce economic costs**.

Improving access to finance and digitalization is key to stepping up private investment in agricultural resilience and productivity as well as improving the earning capacity and food purchasing power of poorer rural and urban households. To this end, critical steps will be advancing property rights, expanding telecommunications infrastructure for mobile banking and enlarging access to early warning systems and up-to-date market and weather information that support agricultural production, distribution, and sales. Reduced informational asymmetries and improved financial literacy would support greater use of insurance. These

reforms would also support microfinance or public-private partnerships that can jump-start private finance.

8.7 Capacity building and institutional strengthening

Capacity building, markets access, diversification, import substitution, advisory services, technology transfer to enhance competitiveness; propose measures to open up export opportunities of select food products; propose opportunities for export/business/product diversification products to new and emerging value chains and options for import substitutions; propose measures to improve food production to substitute major food imports; propose measures by the Private, Public sector and Development Partners to boost resilient, reinvigorated and strengthened regional value chains in agriculture and agro-processing for increased food security in selected food products; and propose measures to open up export opportunities for selected food products.

9.0 FOOD LOSS AND WASTE IN THE EAC

Food loss[10] and food waste[11] is a common phenomenon in EAC and Africa at large. Food loss and wastage (FLW) are experienced at different stages of the food value chain and have different impacts on the food handlers at each stage. In sub-Saharan Africa, food loss is highest during production, postharvest, and during processing. **The magnitude of losses is highest among fruits and vegetables, whereas milk and dairy experiences loses during the distribution segment of the value chain Snel H et.al (2018)**. For instance, in Rwanda, every household wastes 164 kg of food every year while 2,075,405 tonnes lost at household level per year, whereas Burundi wastes 1,184,127tonnes, DRC wastes 8,912,903tonnes, and Kenya 5,217,367 tonnes of food per household per year (Niwe, 2021). Consequently, waste management systems are burdened, food insecurity rises, has a spiralling effect on crises of climate change, pollution and waste, and loss of nature and biodiversity.

FLW systematically reduces the quantities of food at each stage. For instance, small scale farmers suffer from post-harvest loss which leads to reduced income, reduced food and nutrition security and which impacts on their livelihoods. **For large scale businesses, they tend to experience financial risks occasioned by these losses which have a direct impact on their financial stability and waste disposal costs**. In addition, the environment suffers from GHG emissions generated from food waste, whereas households are unable to access safe, quality and inexpensive food. *Table 15* below presents a summary of the FLW to different people along the value chain.

[10] Food loss refers to the decrease in quantity or quality of food throughout the different segments of the food supply chains – production, harvest, postharvest handling, agro-processing, transport, distribution (wholesale and retail), and consumption (based on definition from Save Food Initiative 2015).

[11] Food waste refers to discarding or alternative (non-food) use of food that is safe and nutritious for human consumption along the entire food supply chain, from primary production to end household consumer level FAO, 2014

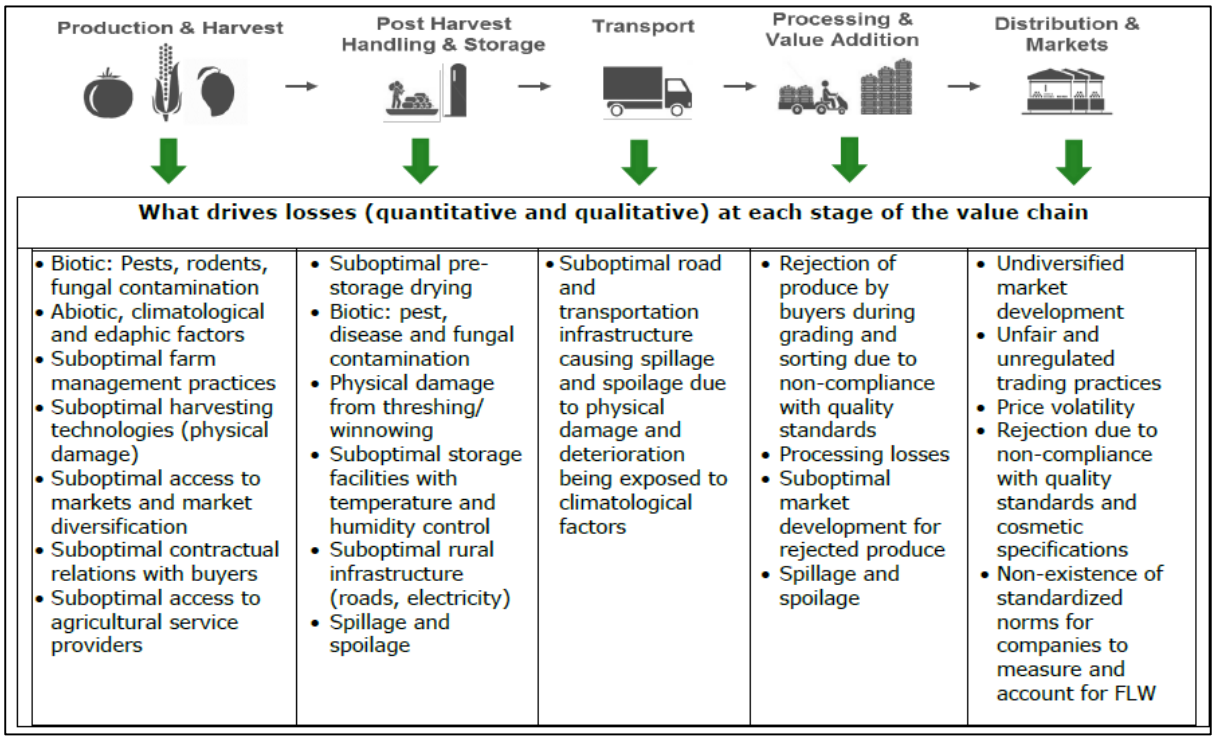
Table 15: Potential Impact of FLW for different Stakeholders

PRODUCERS	FOOD-BASED COMPANIES	CONSUMERS	ENVIRONMENT
• Reduced sales, reduced income • Reduced livelihood security • Reduced food and nutrition security • Increased production risks • Decreased return on investment from agricultural activities	• Reduced sourcing stability and supply chain management efficiency • Reduction in profitability • Increased costs associated with waste management • Lack of access to specific niche markets and added value	• Reduced access to inexpensive food. • Reduced food and nutrition security • Reduced access to sustainably produced nutritious food	• GHG Emissions • Increased pressure on ecosystems and natural resources • Incremental amount of land converted for food production • Reduced resource use efficiency (water wasted and polluted, energy wasted, agricultural inputs wasted)

Source: Hotspot Analysis on Food Loss and Waste in African Agriculture, 2018

These losses are not usually occasioned by poor handling, but also factors beyond the scope of the handlers. *Figure 42* below presents possible causes of food loss and waste at the different value chains.

Figure 42: Causes of Food Loss and Wastage through the value chain



Source: Hotspot Analysis on Food Loss and Waste in African Agriculture, 2018

10.0 VALUE ADDITION IN REGIONAL FOOD SECURITY

Value addition involves the improvements made to the food of interest so as to obtain a high ranking in trade, and also to increase in shelf life of commodities. It is also done to reduce food loss and wastage and improve quality. There are two classifications of the foods of interest in the study: food of economic interest in trade (milk, meat, fruits and vegetables, fish and sea food, eggs), and staple foods (mainly cereals, pulses, tubers and roots).

Livestock production in general has experienced developments in its value chains. The meat value chain is characterized by low quality meat sold at the local butcheries whereas abattoirs which produce quality meat and meat products are sold to high end hotels, supermarkets, and export markets.

The dairy sector plays a key role in most East African countries. For instance, Uganda has the Dairy Master Plan; Kenya- National Dairy Master Plan; Tanzania- Tanzania Livestock Master Plan, etc. These policies and strategies are meant to help the reduce post-harvest milk losses along the value chain through regulations and standards, and quality tests and certification processes; to increased milk value addition and branding on nutritional health attributes and promotion; expand milk processing capacities; monitoring feed quality; imposing heavy penalties and sanctions on trade malpractices; diversification of milk products; among others (Ministry of Livestock Development-Kenya, 2021).

There have been developments in the tubers group, especially cassava. Though originally a cottage industry mainly characterized by boiling, roasting, and frying, cassava is mainly harvested for flour and for preparing chips. Cassava is moving from small scale to agro-processing and value addition. The high-quality cassava flour (HQCF) is one of the developments used as a substitute for imported raw material, alongside other intermediate shelf staples industrial raw materials such as chips and starch. In Kenya and Rwanda, dried chips and flour are common (Abass, 2008).

Maize accounts for almost half of the calories and protein consumed in Eastern and Southern Africa (ESA) with regional yields as high as 1.5 tonnes/ hectare in East Africa (Smale M, 2011). There have been developments since 2005 through projects designed to improve productivity of maize by the introduction of the Drought Tolerant Maize for Africa (DTMA), the Improved Maize for African Soils (IMAS), the Water Efficient Maize for Africa (WEMA), and with the introduction of nitrogen use efficient (NUE) maize hybrids (Macauley, 2015). Kenya has also deployed the Striga-tolerant improved maize varieties. Maize value addition is at the various levels of processing, preserving, and packaging levels such as popcorn, infant food blended, roasted corn, corn flakes, roasted corn, etc. At the lower levels are roasting or boiling and selling. This is done by small scale traders.

Rice is also a common commodity with value addition. Rice flour is blended with millet and soya to have porridge flour (common in Uganda); mixed with coconut milk and sugar then deep fried to prepare “vitumbua” in Kenya and Tanzania; mixed with wheat flour to prepare children snacks, etc. This is with the understanding that rice that is used for consumption in

East Africa is also imported because of inadequate local supply; poor quality local brands; and the opening of trade through the EAC Common Market.

Other commodities that have developed value chains include fish and sea food. **EAC has different legislations and Sanitary and Phyto Sanitary (SPS) measures regarding fish trade in the region**. Fish farming is growing to complement crop farming as it is a high protein and minerals rich food. The main source of fish are lakes and rivers in the EAC region, such as lakes Victoria, Turkana (Kenya), Kyoga (Uganda), River Nile (Uganda), Lake Kivu (Rwanda), just but to mention a few. However, Lake Victoria is the main supplier of fish in the EAC region as it spans 3 Partner States with communities surrounding obtaining their livelihoods from fishing. In addition, fish ponds are gaining momentum to fill the deficit of fish produced at the main sources with Nile perch being a preferred species. Due to the perishable state of fish, preservation techniques aim to prolong their shelf life. Traditionally, tilapia and Nile perch common species were smoked and sun dried then transported to be sold offshore. In Kenya, the Fish Farming and Enterprise and Productivity Programme (FFEPP) was a government intervention seeking to improve fish outcomes through provision of fingerlings, extension services, and capital for investment in the sector. Consequently, fish was sold to traders in local markets, schools, hospitals, and only experienced smoking, sun-drying and freezing methods in Kirinyaga county (Joyce Maina, 2015).

Fruits like passion, pineapple, mangoes, banana, oranges, grapes and others are commonly produced in the region, and are usually seasonal crops. There is already a developed market in Kenya in the processing of fruits into juices, fruit slices in tins for exports, etc. The largest company in Kenya for this is Delmonte which serves the local and export markets. In addition, there have been climate smart technologies employed in the fruit processing value chain. This involves mobile solar food processing of fruits. It does the processing of second-grade (or "ugly") fruit into dried snacks and powders and is crucial for reducing post-harvest losses and increasing farmers' incomes (we4F, 2021).

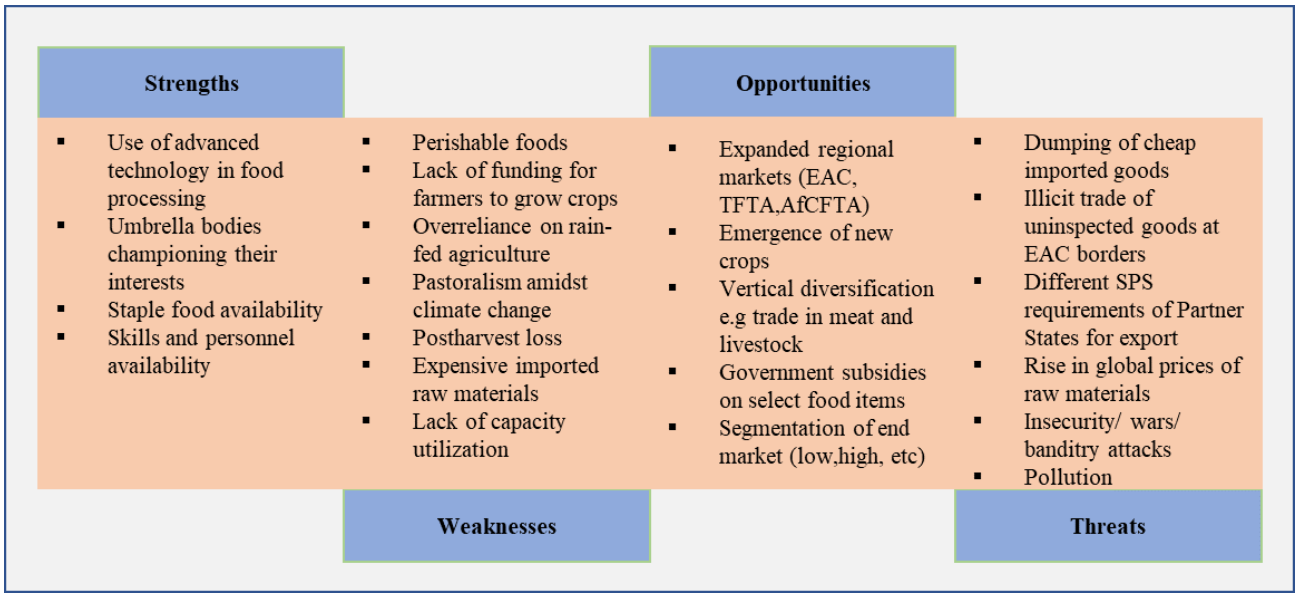
Roots and tubers forming the second largest group of staples after cereals have withstood the test of time in that their shelf lives are greatly increased, thanks to the various processing methods along the value chain. For instance, sweet potatoes and arrow roots are now being dried and grinded to form flour which is used to blend porridge. This is useful especially considering the seasonality of the crops. In addition, some are used to prepare crisps/ chips snacks.

10.1 SWOT

This section presents a SWOT analysis of EAC food systems in relation to MSMEs and large companies engaging in value addition and processing of grains, edible oil, fertilizers, and major staple foods in the regions *(Figure 43)*. For instance, those opportunities in vertical diversification[12] serve as an important aspect in ensuring fewer losses in the food system.

[12] Vertical diversification involves expanding export to include the processed forms of the same type of commodity that is already exported in raw form. Horizontal diversification on the other hand refers to

Figure 43: SWOT Analysis of MSME and Large companies on Value Addition



10.2 Stakeholder views

Value addition has been a progressive approach to ensuring that food stays longer, way past the harvest season, and as a result, job opportunities have emerged in the various value chains. One common food is maize, which is largely seasonal and a staple food in many of the Partner States. There are a number of milling plants, both traditional (posho mills) and the established ones such as Unga Mill Ltd, Alpha Millers (in Kenya), Joydons (T) Limited (in Tanzania), Nambale Super Millers (Uganda), etc. Maize is converted to maize flour, and also used to blend millet flours, etc. Ground nuts and sim sim which are also common in Uganda are converted into groundnut and sesame (simsim) pastes and butter. Further, sesame (sim sim) has found another use in Kenya, in that it is used to produce oil. Sesame alongside other nuts has been used to produce oil, despite being unpopular among citizens.

The role of women and youth come out strongly in value addition in that the former is considered to engage in home-level processing, whereas the latter is considered to be driving commercial value addition since they are considered to be more tech savvy, with better trainings and access to markets. In Burundi for instance, women are considered to be the drivers of food security in that they are mainly involved in providing labour for farming activities.
In addition, women are considered to be the ones who trade in agricultural produce in the local markets. Despite the involvement of women in food production and trading of the same, an outstanding thing is that they are the determinants of nutrition in the home as they are largely involved in meal preparation.

the expansion of exports to other types of commodities including non-agricultural or non-food products (e.g. horticultural products, fisheries, services) which has been the case due to strict SPS measures for processed foods.

The youths are slowly embracing agribusiness as a source of income. With the prevailing high poverty and unemployment rates in the region, formal employment is no longer tenable with the tertiary institutions churning out graduates en mass, and on a regular basis. The youths mainly are involved in innovative approaches to food production while embracing technology. In addition, they are involved in climate smart agriculture practices such as the use of hydroponics.

The micro, small, and medium enterprises (MSMEs) play the bigger role cuts across the entire food production and value chain. They deal in expanded commercialized agriculture with value additions such as milling; educate farmers on better farming practices; supervise agricultural producers around the most profitable sectors in their regions; among others. **The private sector also plays an important part in food security as they are involved mainly in value addition such as bio-fortification, and in providing linkages to markets.**

11.0 CONCLUSION

Globally, food security declined in 2021, as the effects of the COVID-19 pandemic continue to hamper progress towards the achievement of SDG 2 goal of creating a world free of hunger by 2030. In addition, world hunger increased in 2021 driven by the effects of the pandemic which drove further existing inequalities increasing the number of people facing in the world from 618.4 million in 2019 to 767.9 million in 2021. The unequal pattern of economic recovery in 2021 among countries and the unrecovered income losses among those most affected by the pandemic have exacerbated existing inequalities and have worsened the food security situation for the populations already struggling the most to feed their families. Food prices have also increased in the past year due to bottlenecks in supply chains, soaring transport costs and other disruptions caused by the COVID-19 pandemic. Furthermore, the war in Ukraine, involving two of the biggest producers in agriculture and staple cereals globally, is disrupting supply chains and further affecting global grain, fertilizer and energy prices, leading to shortages and fuelling even higher food price inflation. On top of this, the growing frequency and intensity of extreme climate events are proving to be a major disrupter of supply chains, especially in low-income countries (LICs) (FAO, 2022).

Similarly, the intensification of the major drivers of food insecurity and malnutrition – conflict, climate extremes, economic shocks, combined with growing inequality – often occurring in combination, continues to challenge the quantity and quality of foods people can access, while making the fiscal situation of many countries more challenging for governments trying to mitigate the effects of these drivers.

To achieve SDG 2 by 2030, agrifood systems must be transformed in ways that ensure they deliver lower cost and safe nutritious foods that make healthy diets more affordable for all, sustainably and inclusively. To this end government must repurpose policy support to make healthy diets more affordable sustainably and inclusively *(Box 2)*. This creates a more conducive environment for private investment that accelerates economic recovery and improves food security for citizens.

The current climate patterns influenced by global warming is proving hostile to rain-fed agriculture. Severe drought dries up food crops while floods sweep away the crop. Either way, these extremes are not good hence the recommendation to embrace climate smart agriculture.

There are new emerging value chains in the food industry that require the adoption of technology, new farming practices, and expansion of businesses by SMEs involved in value addition. One recommendation is that instead of selling meat products for export, they can also start from selling live animals as they have the capacity to reach out to larger markets. Further, instead of over relying on commonly used foods such as wheat for baking bread, etc, MSMEs can champion the use of other roots and tubers such as sweet potatoes and yams for baking hence reviving this value chain which is considered a local one.

EAC Partner States seem always caught off guard by the global crises and climate change. In as much as **climate-smart practices such as the use of hydroponics technology is embraced, there seem less training opportunities on the same**. Further, there seems to be a lot of policies and strategies tacking food security, but enforcement of the same requires partnerships with stakeholders involved in these food value chains. In addition, there is need to further enhance preparedness for climate change extremes and quick adjustments to situations.

EAC food policy measures on food production and selected value chains need more development in order to realise its objectives. While **high taxation on high utility costs (water, electricity) discourage the setting up of industries,** the engagement and follow-through of recommendations by stakeholders will go a long way in addressing the challenges they face. **Incentives need to target the institutions involved in the value chains** while ensuring that **cross border trade with Partner States is enhanced through favourable policies on Sanitary and Phyto Sanitary (SPS) and other food-related ones**. Further, the enforcement of policies on cross border trade will help prevent contraband goods getting into the Partner States which may pose danger to its citizens, such as high aflatoxin in maize. Instead, focus should be on ensuring that their respective **standards measures are adhered to by providing training and readily availing information.**

With the opening up of trade to regional and continental markets through TFTA and AfCFTA, there seems to be more opportunities for Partner States to address their food requirements with less restrictions, imports whenever there are deficits, etc. The export market needs to be well developed through engaging the farmers and traders of agricultural produce by offering trainings and incentives such that when there is excess of harvest, the market options are many, and for quality produced food.

Development Partners play a critical role in food security in that they have just the right skills, technology, developed country and global networks, and **funding to support Partner State on agricultural inputs, trainings on new technology and climate smart agricultural**, etc. They have been very key in all the Partner State. These partnerships have borne fruit in hardship areas by offering food aid as well as training local communities on better farming methods.

Box. 2: Definitions of Repurposing and Food and Agricultural Policy Support

Agricultural policy support typically consists of various types of measures that implicitly or explicitly affect farm gate prices or profitability or provide monetary transfers to farmers or public expenditure and investment in general services and public goods that benefit the agricultural sector. This includes, for example, price (dis)incentives (mainly border measures and domestic price interventions), which implicitly represent transfers from consumers and taxpayers to farmers (or vice versa).

Food policy support is generally broader in scope covering not only how food is produced but also how it is processed, distributed, purchased, or provided, and how these policies are designed to ensure human health and nutrition needs. Unfortunately, the availability of

globally comparable data on this support to the food part of the agrifood system as a whole is limited, as opposed to the policy support to agriculture only, which is less limited.

Agrifood systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products. They comprise all food products that originate from crop and livestock production, forestry, fisheries and aquaculture, as well as the broader economic, societal and natural environments in which these diverse production systems are embedded.

Source: FAO 2023. The State of Food Security Report 2022.

Similarly, the intensification of the major drivers of food insecurity and malnutrition – conflict, climate extremes, economic shocks, combined with growing inequality – often occurring in combination, continues to challenge the quantity and quality of foods people can access, while making the fiscal situation of many countries more challenging for governments trying to mitigate the effects of these drivers.

To achieve food security and nutrition, agrifood systems must be transformed in ways that ensure they deliver lower cost and safe nutritious foods that make healthy diets more affordable for all, sustainably and inclusively. This will encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products[13]. To this end government must repurpose policy support *(Box 2 and 3)* to make healthy diets more affordable sustainably and inclusively. Globally and in EAC region there is a long history of food and agricultural policy support, mostly motivated by the need to promote agricultural productivity, particularly from staple cereals, protect farm incomes and/ to ensure food security. Most agricultural policies are focused on ensuring national food availability, production and prices particularly for cereals (e.g., maize, wheat or rice). This creates a more conducive environment for private investment that accelerates economic recovery and improves food security for citizens.

Box. 3: Agricultural Policy Support on Production and Productivity

Agricultural policy support – impacting on production, productivity.

- Measures that affect farm gate prices or profitability or provide monetary transfers to farmers or public expenditure and investment in general services and public goods that benefit the agricultural sector.
- ***Food policy support-*** to cross border trade in relation to technical standards to facilitate safety in cross border trade in food (SPS, TBT, Taxation and tax waivers, etc.

Source: FAO 2023. The State of Food Security Report 2022.

[13] They comprise all food products that originate from crop and livestock production, forestry, fisheries and aquaculture, as well as the broader economic, societal and natural environments in which these diverse production systems are embedded.

12.0 MITIGATION MEASURES TO ENHANCE PRODUCTION, PRODUCTIVITY, FOOD SECURITY, ACCESS AND AFFORDABILITY

Existing policies globally and regionally have provided incentives for modern agrifood systems to an extent where the cost of a healthy diet is five times greater than the cost of diets that meet dietary energy requirements only through a staple cereal. Globally and in the EAC region, there is a long history of food and agricultural policy support, mostly motivated by the need to promote agricultural productivity, particularly from staple cereals, protect farm incomes and/ to ensure food security. Most agricultural policies are focused on ensuring national food availability, production and prices particularly for cereals (e.g., maize, wheat or rice).

Countries from all regions have dropped the ball on nutritional plans in 2022. Around one third of countries (35 out of 113) have no national nutrition plan or strategy in 2022, nearly double the number that lacked one in 2019. In addition, 25 of 113 countries are not regularly monitoring the nutritional status of their population (compared with 15 in 2019). Without regular monitoring, policymakers cannot identify nutritional deficiencies and deploy resources where needed.

To counter these stresses and shocks, and to ensure food security in the future, stakeholders will need to adopt a systemic approach and build resilience in the supply of food and in the environment upon which food is grown and distributed. Looking at the effects of covid-19 on the food supply system, the longer-term issues highlighted by the pandemic—such as the limitations of cost-efficiency and streamlined supply chains and lack of agility in redistributing supplies between parts of the food sector—will have to be addressed to build resilience to future shocks.

To achieve SDG 2 by 2030, agrifood systems must be transformed in ways that ensure they deliver lower cost and safe nutritious foods that make healthy diets more affordable for all, sustainably and inclusively. To this end government must repurpose policy support to make healthy diets more affordable sustainably and inclusively (*Box 2*). This creates a more conducive environment for private investment that accelerates economic recovery and improves food security for citizens.

In order to entrench food availability, local innovations complemented with incentive schemes, have to be prioritized to create substitutions and diversification options of selected regional food products against major food import products; to overcome producer challenges to create opportunities of both Micro Small Medium Enterprises (MSME), youth and women, and large companies engaging in value addition and processing of grains, edible oil, fertilizers and major staple food in the region. It will also be critical to invest in institutional strengthening and capacity building for the different players to synergize in exploiting available diverse markets.

Capacity building, markets access, diversification, import substitution, advisory services, technology transfer to enhance competitiveness; propose measures to open up export

opportunities of select food products; propose opportunities for export/business/product diversification products to new and emerging value chains and options for import substitutions; propose measures to improve food production to substitute major food imports; propose measures by the Private, Public sector and Development Partners to boost resilient, reinvigorated and strengthened regional value chains in agriculture and agro-processing for increased food security in selected food products; and propose measures to open up export opportunities for selected food products.

There is a need to have national food reserves where by cereals, and other crops are stored when there is surplus by purchasing directly from farmers. For the existing ones, there is a need to increase the capacity and pay farmers on time so that there is enough stock to last through the dry season. Food preservation needs to be enforced to ensure proper storage of agricultural produce, free from contamination. For instance, maize if poorly stored will have higher levels of aflatoxin which is unfit for human consumption. Consequently, this maize cannot be traded, leading to food wastage, then food shortages.

There is a need to introduce orphan crops to other Partner States to complement the main staple diet in homes. For instance, beyond maize, sorghum and millet can be used in normal household meals to avoid overreliance on a specific food. Further, the introduction of drought-resistant crops as normal household meals would ensure there is food during dry season. Such an example is the high-yielding cassava which can be eaten whole, grinded to make flour for porridge or substitute to gluten diet, etc.

Partner States need to allow for emergency exportation to other members in cases where there is shortage in a particular State. This is because drought may not affect all the Partner States at the same time. This will allow the surplus of other States to be exported to the other members without trade restrictions. This may involve temporarily suspending the export ban to meet the needs of fellow Partner State.

Policy Considerations for Mitigation Measures in Enhancing Food Security

- In the context of climate change, greater regional trade integration can enhance food availability and affordability. Combined with resilient storage and transport infrastructure (for example, better coverage and quality of roads, train lines, and ports), it can facilitate sales of one country's bumper harvests—that may have gone to waste—to a neighbouring country facing shortfalls.66 In turn, prices in both countries will remain stable, incentivizing longer-term agricultural investment. By the same token, increased regional trade could open new markets for farmers and agri-businesses and contribute to developing production networks and value chains across SSA.67 The resulting knowledge transfers, including for adaptation (for example, optimizing drought-resistant crops, best-suited equipment for a given terrain and training on its use, energy-efficient agricultural practices), as well as the competition could boost productivity.
- Fiscal policies focused on social assistance and efficient public infrastructure investment can improve poorer households' access to affordable food, facilitate expansion of climate-resilient agricultural production, and support quicker recovery from adverse climate

events. Critical infrastructure areas include irrigation systems, telecommunications, transport, storage facilities, and renewable electricity. In cases where agricultural subsidies are present, the subsidies should be redesigned to ensure better targeting and reduce economic costs.

- Improving access to finance and digitalization is key to stepping up private investment in agricultural resilience and productivity as well as improving the earning capacity and food purchasing power of poorer rural and urban households. To this end, critical steps will be advancing property rights, expanding telecommunications infrastructure for mobile banking and enlarging access to early warning systems and up-to-date market and weather information that support agricultural production, distribution, and sales. Reduced informational asymmetries and improved financial literacy would support greater use of insurance. These reforms would also support micro finance or public-private partnerships that can jump start private finance.

- Greater regional trade integration and resilient transport infrastructure enable sales of one country's bumper harvests to its neighbours' facing shortages. Tariff reduction and regional alignment of agricultural and product market laws and regulations (especially with respect to water, seeds, and fertilizer) will all be elemental. Expansion of producer organizations can facilitate adoption of new technologies, scale up food production and distribution, and support price stability

Source: IMF Climate Change and Chronic Food Insecurity in Sub-Saharan Africa, 2022

ANNEXES

Annex 1: Methodology

1. Use of Indicators

Indicators will provide standard measures that encourage comparison and replicability. More specifically, standard indicators will be used to respond to the ToR. Majority of the indicators selected will be used to assess food security through quantitative approaches. Other indicators will seek to demonstrate potential export markets, and food substitutions/ innovations. They include:

i) Global Food Security Index (GFSI)

It is an annual assessment measuring food security through affordability, availability, quality and safety, and sustainability and adaptation. It is a weighted pillar of all scores ranging between 0 and 100, and therefore providing a rank. The higher the score, the more favourable a country is in terms of food security.

Expected Output

1. Status of food security of a country for different years
2. Ranking of countries by food security status

ii) Food Self-Sufficiency Ratio

It is defined as the percentage of food consumed that is produced domestically.

$$SSR = \left(\frac{P}{P + 1 - E}\right) \times 100$$

Where P is production, I = imports, and E = export

If SSR<80%, and it implies that a country is a net food importer; SSR 80%-120% the country roughly produces the same amount of food that they consume, meet dietary needs (hunger < 5%), and may export some food.; and SSR >120% implies that a country typically meets dietary needs and exports surplus.

Expected Output

1. Domestic production data related to the selected food products produced in the EAC.
2. Ranks a country in terms of import status.

iii) Prevalence of Undernourishment (PoU)

It is the proportion of the population whose habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal active and healthy life. It is an estimator of chronic food deprivation ("hunger"). It is expressed as a percentage. It is computed over a 12-month period. This will be done at the country and regional level with the rest of the world.

$$P(U) = P(x < MDER) = \int_{x<MDER} f(x \mid DEC, CV, Skew)dx$$

Where P(U) is the proportion of undernourished in total population;

- DEC is the average of the distribution of habitual daily per capita dietary energy consumption in the population;
- CV is the coefficient of variation of the distribution of habitual daily per capita dietary energy consumption in the population;
- Skewness is the skewness that characterize the asymmetry of the distribution of habitual daily per capita dietary energy consumption in the population; and
- MDER is the minimum dietary energy requirements of the population.

Expected Output

1. Impact of global food crisis on food security

iv) Depth of Food Deficit

It indicates how many calories would be needed to lift all undernourished people from their status, everything else being constant, that is, looks at the severity of dietary inadequacy. It is used to assess the multiple dimensions and manifestations of food insecurity and the policies for more effective interventions and responses. It is measured in kilo calories per day. It is a derivative of PoU.

Expected Output

1. Impact of global crisis on food security -looks at severity.

v) National energy available from non-staple foods

It is the energy available from non-staple foods in the food supply. It could be a proxy for the overall quality of national food supply. It is computed as the percentage contribution of calories from non-staple food (i.e., all food items excluding tubers and grains) to the total food energy supply.

Expected Output

1. Quality of national food supply

vi) Global Hunger Index

It is an index that provides awareness on the extent of hunger across countries and regions. It is a composite index constructed from three equally weighted indicators: proportion of undernourishment, prevalence of child underweight, and child mortality. The higher the score, the more food secure a country is.

Expected Output

1. Impact of global crises on food security over time

vii) Prevalence of moderate and severe food insecurity

It is in an estimate of the percentage of people in the population who live in households classified as severely food insecure. It is an indicator of lack of food access. It is calculated as a 3-year average (2014-16), to reduce the impact of excess sampling variability due to small size of the samples used for many countries.

Expected Output

1. Impact of global crises on food security over time

viii) Cereal import dependency ratio

It is a measure of how much of the available domestic food supply of cereals has been imported and how much comes from the country's own production. This indicator provides a measure of the dependence of a country or region on cereal imports. It is computed in 3-year averages to reduce the impact of possible errors in estimated production and trade, due to the difficulties in properly accounting of stock variations in major food. The greater the indicator, the higher the dependence.

$$IDR = \left(\frac{I-E}{P+I-E}\right) \times 100$$

Where, IDR is the cereals import dependency ratio expressed as a percent.

I am cereals import, E is cereals export, and P is cereals production.

Given this formula the indicator assumes only values <= 100. Negative values indicate that the country is a net exporter of cereals.

Expected Output

1. The extent of dependency of a country on cereals import.

ix) GDP Per Capita

It is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products divided by the mid-year population. It gives a measure of the economic prosperity of its citizens.

Expected Output

1. Compare EAC Partner States economic prosperity of its citizens.

x) Value of food imports in total merchandise export

It is the value of food (excl. fish) imports over total merchandise exports. This indicator provides a measure of vulnerability and captures the adequacy of foreign exchange reserves to pay for food imports, which has implications for national food security depending on production and trade patterns.

Expected Output

1. Status of food security

xi) Domestic Food Price Level Index

It is an indicator of the relative price of food in a country. It is an important indicator for global monitoring of food security because it compares the relative price of food across countries over time.

Expected Output

1. Changes in prices of food commodities over time

xii) Domestic Food Price Volatility

It is a measure of the variability in the relative price of food in a country. It is calculated from the monthly domestic food price level index using monthly consumer and general food price indices and purchasing power parity data. Therefore, it compares the variations of the domestic food price index across countries and time.

Expected Output

1. Impact of global crises on food security
2. Price volatility of imports of the selected food products into EAC from the Rest of the World

xiii) Food Production Index

The food production index covers food crops that are considered edible and that contain nutrients. Coffee and tea are excluded because, although edible, they have no nutritive value. It shows the relative level of the aggregate volume of agricultural production for each year in comparison with the base period 2014-2016.

Expected Output

1. Direction of food production- improving or declining

ix) Commodity Price Indices

It is a fixed-weight index or (weighted) average of selected commodity prices. It is an index that tracks a basket of commodities to measure their performance. This indicator will be computed for 3 consecutive years for oils, grains, and fertilizers.

$$L_{t,0} = \frac{\sum_{i=1}^{n} p_{i,t} q_{i,o}}{\sum_{i=1}^{n} p_{i,0} q_{i,0}} = \sum_{i=1}^{n} \frac{p_i^t}{p_i^0} s_i^0,$$

Where?

where si0 represents the weight of the commodity index item i (see Section 3 above) and pit is the price in period t (see Section 4 above). qi0 is the quantity of the commodity index item i in the base period.

Expected Output

1. Fluctuations in prices of commodities of interest and in the period of interest

Other indicators

x) Intra-Industry Trade

The sectoral intra-industry trade (IIT) is a measure of the degree to which trade in a particular sector represents intra-industry trade (based on scale economies and/or market structure). By engaging in IIT, a country can reduce the number of similar goods it produces, and benefit from scale economies. It measures comparative advantage. Higher IIT ratios suggest that these sources of gains are being exploited. May also indicate that adjustment costs would be lower with trade expansion.

$$IIT = 1 - \left[\frac{\sum X_{sd} - \sum M_{sd}}{\sum X_{sd} + \sum M_{sd}}\right]$$

Where?

IIT = Intra-Industry Trade

$\sum_{xsd}$ = country or region sector specific exports

$\sum_{msd}$ = country or region sector specific imports

Range of values: The index ranges from 0 to 1, with zero indicating pure inter-industry trade, and one indicating pure intra-industry trade. A higher IIT reflects an industry with economies of scale.

Expected Output

1. Level of inter-industry trade

xi) Revealed Comparative Advantage (RCA)

Measures Revealed Comparative Advantage (RCA) have been used to help assess a country's export potential. The RCA indicates whether a country is in the process of extending the products in which it has a trade potential, as opposed to situations in which the number of products that can be competitively exported is static. It can also provide useful information about potential trade prospects with new partners. Countries with similar RCA profiles are unlikely to have high bilateral trade intensities unless intra-industry trade is involved. RCA measures, if estimated at high levels of product disaggregation, can focus attention on other non-traditional products that might be successfully exported. The RCA index of country i for product j is often measured by the product's share in the country's exports in relation to its share in world trade. Revealed comparative advantage (RCA) is given as:

$$RCA_{ij} = \left(\frac{x_{ij}/X_{it}}{x_{wj}/X_{wt}}\right)$$

Where x_{ij} and x_{wj} are the values of country i's exports of product j and world exports of product j and where X_{it} and X_{wt} refer to the country's total exports and world total exports. A value of less than unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product.

Expected Output

1. List of Partner State food products with potential to become competitive in existing and new markets
2. Priority interventions to enhance the competitiveness of the Partner State products.

xii) Export Specialization Index

The export specialization (ES) index is a slightly modified RCA index, in which the denominator is usually measured by specific markets or partners. It provides product information on revealed specialization in the export sector of a country and is calculated as the ratio of the share of a product in a country's total exports to the share of this product in imports to specific markets or partners rather than its share in world exports. Export diversification (ES) index is given as:

$$ES = \left(\frac{x_{ij} / X_{it}}{m_{kj} / M_{kt}} \right)$$

Where x_{ij} and X_{it} are export values of country i in product j, respectively, and where m_{kj} and M_{kt} are the import values of product j in market k and total imports in market k. The ES is similar to the RCA in that the value of the index less than unity indicates a comparative disadvantage and a value above unity represents specialization in this market.

Expected Output

1. List of food products benefitting from comparative and competitive advantage in the EAC Partner States

2. Benchmarking best practices

This qualitative aspect will involve observing different country approaches in policies, technology applications, training, and capacity building, value addition, leveraging existing global, regional, and national policies for import substitution and local content development, investment, meeting domestic demand dependent on imports, exploring opportunities for expanding and diversifying production and value addition in traditional drought-resistant crops, etc.

Expected Output

1. Demonstrate the local innovations, substitutions and diversification options of selected regional food products against the selected major food import products.
2. Policy measures that improve food production and security in selected value chains.
3. Measures to improve food production to substitute major food imports.
4. Demonstrate the opportunities for the EAC Partner States to enhance food security and open export opportunities for selected food products.

Annex 2: Questionnaire

Food Security amidst Climate Change and Global Crises

Introduction

The EABC supports the private sector to become competitive in the region and internationally by advocating for a conducive business environment and articulating private sector interests in the EAC integration process, and continental and international trade agreements. In response to the COVID-19 pandemic, climate change and other global crises, the EABC has contacted

a consultant to carry out a study to analyse and identify selected regional food products and chart out measures to improve food security in the EAC. This questionnaire intends to collect your views and opinions in order to shed lighter on the quantitative data available and be able to recommend to the EABC Secretariat policy measures. The views collected will also contribute to the improvement of food security in the EAC region. The time required to fill the questionnaire is estimated to be between 15 and 20 minutes.

A: Background information

- Name _____
- GenderMale [Female [ ]
- Age group below 20 [ ] 21-30 [ ] 31-40 [ ] 41-50 [ ] 51-60 [ ] above 60 [ ]
- Occupation _____
- Sector Private [ ] public [ ] NGO [ ] Development Partners [ ]
  Others (specify) _____ [ ]
- Country _____

B: Food security

What are the staple foods in your country?

What are the common food commodities traded in your country? (list up to 5)

What are some of the factors that affect food security in your country?

What food security policies are in place in your country?

Are there price control laws/ policies in your country that you are aware of? Yes [ ] No [ ]
If Yes, List them.

What are the sources of the following:

Item	List the sources (up to 3)

Fuel	1. _____ 2. _____ 3. _____
Fertilizer	1. _____ 2. _____ 3. _____
Seeds	1. _____ 2. _____ 3. _____
Other agricultural inputs	1. _____ 2. _____ 3. _____

What foods are currently in high demand? List up to 5.

What incentives should be given to the private sector to encourage them to take part in promoting food security?

C: Agricultural Food Value Chains

Are you aware of the value of addition done to common food commodities in your country? Yes [ ] No [ ]

If Yes, list the food commodity and the nature of value addition.

Food item	**Describe the processing undertaken**

What are some of the issues/ challenges affecting value chains?

What are some of the measures you propose to boost the regional value chains for increased food security?

D: Climate Change

Have there been adverse climatic effects in the last 5 years? Yes [ ] No [ ]

If Yes, of what nature?

Item	Response
Flood	Yes [ ] No [ ]
Mudslides	Yes [ ] No [ ]
Drought	Yes [ ] No [ ]
Others (specify) _____	Yes [ ] No [ ]

How has climate change impacted on food security?

How should climate change be addressed in order to improve food production?

E: Global Crises

What global crises are you familiar with?

How has global crises affected food security?

What should be done to mitigate the negative effect of global crises on food security?

Thank You!

Annex 3: Feedback from the Questionnaire

Demographics

There were 35 respondents who responded to the online tool shared from all the Partner States with about 70% male. Of the respondents, the majority were in the age-group 51-60 (30%) followed by 41-50 (23%). The youths were also represented by 15% of the respondents. There was also diversity in the occupations of respondents, with supply chain officers, economists, shipping and marine consultants, traders, plant health inspectors, horticulturalists, marketers, lawyers, CEOs, veterinarians, engineers, policy analysts, marketers, scientists, among others. Further, more than half of the participants were drawn from the private sector followed by the

public sector (over 20%). About 5% were drawn from umbrella bodies in the agricultural value chain sector. In addition, participants were drawn from all the East African Partner States, including Democratic Republic of Congo (DRC).

Staple Foods and Trade

It was noted that staple foods are more or less similar across Partner States, mainly dominated by cereals, roots and tubers. Specifically, maize, rice, sorghum, millet, cassava, bananas, sweet potatoes, groundnuts, yams, rice, and pulses. It is important to note that these foods are the same ones that are mainly traded in the region, such that the shortage in one Partner State leads to the importation from the others within the trade area, and in the event of severe shortage, imports from as far off as SADC countries.

Factors affecting food security.

Several factors were identified as those that lead to or worsen the food security in the region. They include: inflation, poor infrastructure, pests& diseases affecting crop and livestock; government policies in place; restrictive trade regimes; insecurity; land scarcity; land fragmentation; lack of appropriate agricultural skills; local farming methods which are low yielding; high cost of production; among others.

Policies on Food and Prices of Food

A number of policies and measures have been put in place by governments in the Partner States to ensure that there is enough food for its people. Unfortunately, these policies are not largely known, but there seems to be a general idea on what is acceptable and what is not. Worse off, more than half of the respondents (59%) are not aware of price laws in their countries. Some of the policies that the stakeholders are familiar with include that of banning exports (restriction on specific food items over a given period of time), strategic grain reserve/ national storage facilities, price ceiling for specific foods. More specifically, in Kenya, there is the Competition Act (2010) Minimum Support Pricing (MSP), Price Control (Essential Goods) 2011, Suga Act, etc.

Sources of Fuel, Fertilizer, Seeds, and Agricultural inputs

Fuel is largely imported as most Partner States are not commercial producers, with the exception of South Sudan. Fertilizers are largely imported and supplied by National Cereals and Produce Board (Kenya), shops (such as agrovet in Kenya), while the organic ones are obtained from bio-feeds and own production. On the other hand, seeds are obtained from national suppliers (such as Kenya Seed, National Seed Research Organizations), other research firm (hybrid seeds)s, private seed companies, farmers' cooperative societies, etc.

Role of Various Groups in the agricultural value chain

The role of women is more or less similar across Partner States. They are involved in production, home-level processing, waste management, irrigation through women groups, trade of farm produce, and are the main determinants of the nutritional needs of the home.

The youth on the other hand largely provide labour in farms, are involved across the value chain, practice climate smart agriculture, prepare nurseries for seedlings, offer trainings in emerging technologies. The MSMEs are largely involved in processing, passing knowledge, invest in commercialized agriculture with value addition, sponsor farmers on agricultural practices, showcase new innovations in agriculture in trade fairs, carry out preservation of foods, etc.

Other important groups include cooperative societies that offer loans to farmers, supply agricultural inputs, offers collective voice against food price fluctuations, etc. Another group are the brokers/ middlemen who link up farmers to markets; the government offers subsidies on agricultural inputs and price ceiling, gets involved in opening up markets to the regional and international level through agreements, control pollution in the entire value chain; development partners who offer trainings on better farming technologies, provide financial assistance to farmers; large companies are involved in fortification of food, use efficient technologies in processing foods/ value addition, contract farming of special crops such as sorghum for beer manufacturing; among others.

Challenges facing value addition.

The challenges facing Partner States are more or less similar. Some of the highlighted ones include post-harvest loss, exploitation by middle-men, pest &diseases such as the fall army warm, land fragmentation due to population exploitation, poor transport network linking the markets, high fuel costs raising the cost of production, global shocks raising prices of goods and inputs, ineffective agricultural extension services, among others.

Boosting regional value chains

In order to improve the regional value chains, several suggestions came up. Some of them include improve on the current trade policies; offer diversification options; improve SPS compliance and harmonization of the same; encourage mini-processing at the farm gate for produce to improve shelf-life; offer organized financing to farmer groups; encourage/ remove barriers to cross-border trade; establish value chain promotion body, remove double taxation in rural areas; just but a few.

Climate Change in the last 5 years

It is evident that there has been diverse weather in the recent past, from flooding, to drought situations. Excess flooding has caused mudslides in Partner States such as Uganda and Kenya, destroying homes and crops. Hailstones have also been experienced in cold places in Kenya. Soil erosion as a result of flooding in Imbo and Mumbiwa regions of Burundi has led to soil erosion and flooding, thus destroying the transport network. Drought also dries up animal watering points, hence a decrease in milk production, and even death of livestock. The larger effect of climate change is migration of labour and destruction of crops and animals.

Addressing Climate Change

It may be hard to control climate change, but some contribution towards it will definitely help address the food production challenges. Some of the ways proposed include: enforcement on

deforestation policies; reduction in greenhouse gas emission; encourage water-harvesting at household level; promotion of climate smart agriculture and enforcing of climate-smart technology; establish long-term irrigation initiatives; afforestation and reforestation; provision of a framework for mainstreaming climate change considerations into various sectoral policies and development planning at all levels; offering incentives for investments in low-carbon development; consultative effort by the governments, research institutions, and stakeholders in adopting climate-smart agriculture;

Effect of Global Crises on Food Production

Some of the global crises mentioned include wars (Russia-Ukraine), earthquakes (Turkey, Syria), pandemics (Covid-19), global hunger, economic recession (Europe), drought, and flooding. The effects of such disasters have been increased costs of agricultural inputs, inflation, disruptions of agricultural food chains, high cost of living, etc.

Mitigating the negative effects of global crises

Some for the measure highlighted include; ending wars, early warning systems, building resilient food systems, practicing regenerative agriculture, adoption of smart water harvesting techniques, surveillance, Partner States to have strategic food reserves, lifting economic sanctions, proper supply chain management, green jobs creation and investment in green industries.

Role of technology in enhancing food security

The use of mobile phone apps that help forecast weather and gives an indication of planting season; use of e-commerce and social media to market agricultural produce; offer food preservation techniques; high-tech machines increase food production; modern irrigation methods adoption; agritech and biotechnology improves food security; drones are available to assist with crop growth and water levels; use of solar water pump technologies for irrigation; construction of silos and hardware for reserving food commodities using high technology; are some for ways proposed to improve food security of Partner States. However, for technology to be embraced, there needs to be training on technical know-how, good internet access to use mobile phone apps, awareness across value chains, trainings, and availing financial assistance to aid this adoption.

Agricultural Trainings

The majority of the respondents (over 60%) are familiar with training happening in their countries. Some of these institutions include KALRO, Kenya School of Government, Agricultural training colleges, Kenya Plant Health Inspectorate Service-Pest Management, Laboratory Diagnosis, Potato production in Kenya; Kilimo Kwanza, Kilimanjaro Agricultural Training Centre, Tanzania Agricultural Research Institute, TIRDI, SUA, CAMARTEC, Sokoine University of Agriculture, Vocational Education Training Authorities, in Tanzania; Rwanda Agriculture and Animal Resources Development Board (RAB) in Rwanda; and other agencies such as GIZ, INPP, etc.

As for private institutions, we have Farmer Training Centres; Baraka Agricultural College training on sustainable farming, Bee Keeping, Dairy Farming, Organic Farming; Stewardship

Agribusiness Incubation Centre (SAIC), they train on value chain development from inputs chain; YARA on fertilizer use; Synergy - Offer multiple types of training including on production, distribution & marketing, value-addition; among others. On the other hand, development partners such as FAO (trained community animal health workers on how to help in animal vaccination and treatment from common animal diseases); Hand in Hand East Africa - offer trainings and fund farmers in dry areas; One Acre Fund, Roots Capital - Offer multiple types of training including on production, distribution & marketing, value-addition.; Tanzania Organic Agriculture Movement; AFSA training in food security; CNFA; TATEDO; CNFA; International Trade Centre – on job creation; etc.

Challenges faced by training institutions.

Some of these institutions lack funding for their programmes; failure to link graduates to the farmers/ markets; private institutions are not valued like the public ones; the development of research in universities has been neglected for several decades - difficulties in contributing to finding solutions to the various societal challenges (food insecurity, energy crisis, financing problems, climate change, etc; limited subsidies into Training and Technical Skills development so that extension services delivery plays its optimal role; lack of trainers, course content, and relevant curriculum; poor follow up on trainees; some programs are emergency based as opposed to continuous; among others.

Incentives to SMEs to encourage participation in value addition.

For value addition to be entrenched in SMEs, it is important to have then access capital; link them to agricultural insurance schemes; offer tax incentives; offer technology tax-relief; have public-private partnership; have enabling regulatory environment; stable policies on land for production; give preferential financing for climate-friendly investments; offer tax and carbon credits; offer subsidies; and market accessibility.

Annex 4: List of Participants

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