

Voluntary Sustainability Standards in East Africa

September 2022

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REGIONAL REPORT

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Voluntary Sustainability Standards in East Africa

September 2022

Written by Laura Turley, Steffany Bermudez, Vivek Voora, Ann Wilkings, and Sara Elder

All photos: Anold Zesecand/Sustainable Agriculture Tanzania

Photography

Photos in this report depict agriculture workers, facilities, and products related to Sustainable Agriculture Tanzania's (SAT) operations in the Morogoro and Mvomero regions. The photos were taken in July 2022 by Anold Zesecand and are used here with SAT's permission.

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Workers in Mvomero separating clean and unsuitable rice through a local method known as *kupepeta* in Swahili

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- Eastern Africa Farmers Federation (EAFF)
- Embassy to Sweden, Uganda
- GLOBALG.A.P.
- International Federation of Organic Agriculture Movements (IFOAM)
- Kenya Organic Agriculture Network (KOAN)
- National Organic Agricultural Movement of Uganda (NOGAMU)
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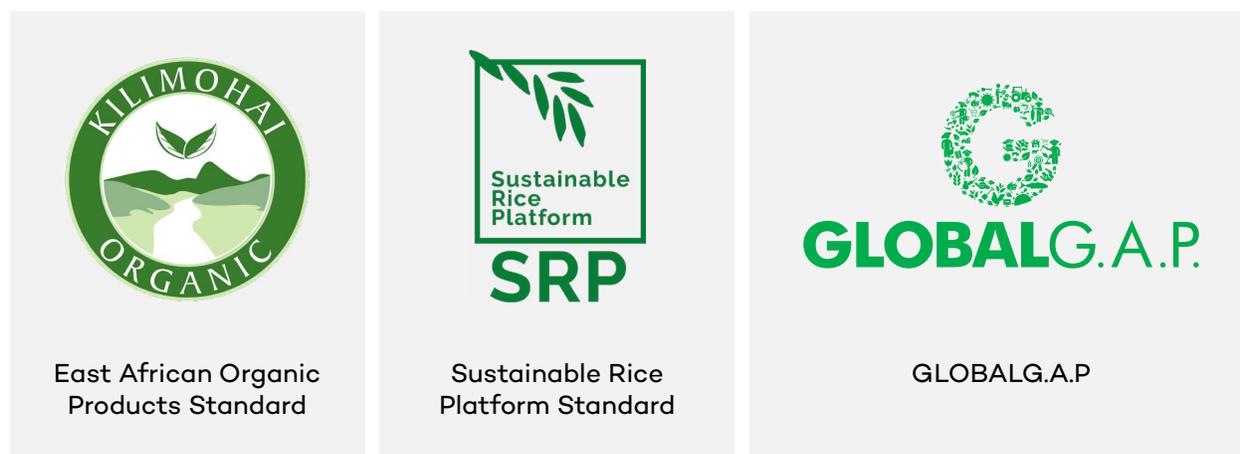
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Executive Summary

Agriculture is a pillar of the economy in East Africa, employing as much as 80% of the population and representing 25% of GDP. For the countries of the East African Community (EAC)—Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda¹—agriculture is a priority sector for improving rural livelihoods and enhancing intraregional trade. As such, through the development of joint regional policy, legislation, and projects, the EAC seeks to address some of the persistent challenges faced by the sector, in particular: maintaining and improving agricultural productivity, overcoming trade barriers and improving intraregional trade, and building resilience to climate change.

This report provides information, analysis, and recommendations on how voluntary sustainability standards (VSSs) in East Africa can be scaled up to support agricultural policy objectives. VSSs specify requirements that producers, traders, manufacturers, retailers, or service providers may be asked to meet, relating to a wide range of sustainability metrics, including respect for basic human rights, worker health and safety, the environmental impacts of production, community relations, land-use planning, and others. With a particular focus on facilitating intraregional trade, we selected VSSs that are active in staple crop production, specifically beans, maize, rice, and wheat, since these commodities are among the most traded in this region. The three VSSs included in this analysis are the East African Organic Production Standard (EAOPS), the Sustainable Rice Platform (SRP) Standard, and GLOBALG.A.P. (including localg.a.p.).

The VSSs assessed in this report:

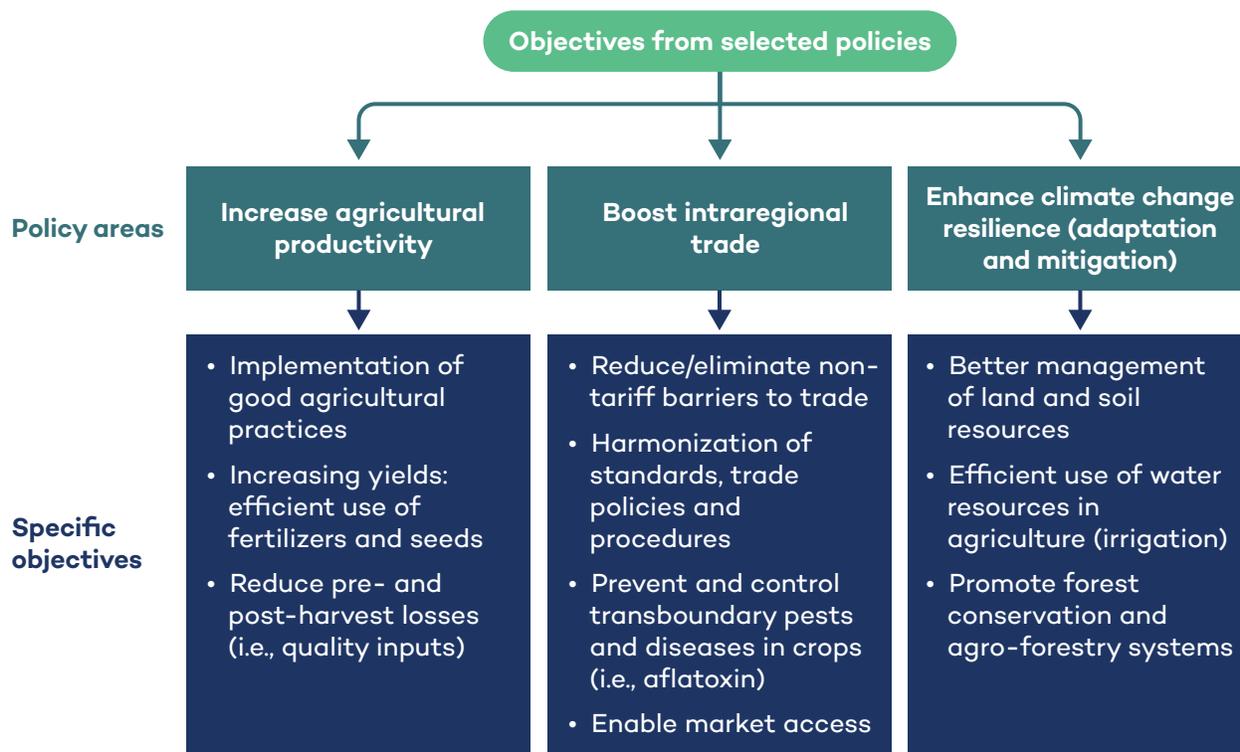


¹ The report was written before the Democratic Republic of the Congo officially joined the East African Community on March 29, 2022, as the seventh Partner State.

Our research shows that EAC Partner States have tremendous potential to increase the production and trade of staple crops in the region. Smallholder farmers, in particular, stand to gain, as they form a large part of the supply base and depend on staple crops for their income and livelihoods and for their own consumption. This expansion will require EAC Partner States to bridge the “production gap” between current production levels and the potential attainable yield. We argue that VSSs have an important role to play here, scaling up production in ways that support the sustainability of vital ecosystems, use scarce resources efficiently, and prioritize the livelihoods and rights of workers.

The EAC’s shared vision for the agricultural sector can be found in regional policies such as the EAC Common Market Protocol (2011), the EAC Agriculture and Rural Development Policy (2006), and the EAC Climate Change Policy (2011). In this report, we use three major policy areas in these documents—which correspond to major challenges faced by the agricultural sector in the EAC—as a framework for analyzing how VSSs can support agricultural development. To do this, we conduct a detailed benchmarking of VSS requirements against the EAC agricultural policy areas to 1) improve agricultural productivity, 2) boost intraregional trade, and 3) enhance climate change resilience.

Figure ES1. Agricultural policy areas and objectives, EAC



Through this analysis, we find particularly strong alignment between VSS requirements and the EAC policy area “Enhancing climate change resilience.” Climate change continues to negatively affect the production of beans, maize, grain, and rice in the EAC through exposing farmers to droughts, floods, and resource degradation. We find that there is a role for VSSs in creating incentives for farmers, cooperatives, and small businesses to engage in climate-resilient practices, such as improving the quality of soil, using water resources efficiently, and integrating more agro-forestry practices.

There is medium alignment between VSS requirements and the EAC policy area “Increasing agricultural productivity.” VSSs promote best practices in managing some of the specific challenges related to agricultural productivity faced in the EAC. Notably, in dealing with the aflatoxin contamination that threatens the maize and wheat sectors, the VSSs examined have specific provisions for improving storage, handling, and transport to reduce the risk of such mould contamination. For other agricultural productivity issues, such as the use of chemical or genetically modified inputs, VSSs can provide approaches for responsible ways forward that might provide a middle ground for some long-standing debates. This can be relevant for the bean, maize, grain, and rice sectors in the EAC, which all have challenges in improving the quality of inputs such as seeds, fertilizers, and pesticides.

Finally, we also find medium alignment between VSS requirements and the EAC policy area “Boosting intraregional trade.” We confirm that there is potential for greater intraregional trade of staple crops in the EAC, namely for beans, maize, grain, and rice, and that VSSs have the potential to further support this integration. Producer compliance with national and regional legislation and regulations is always required for VSS certification, which inherently supports standardization and harmonization, and each of the VSSs assessed have provisions on working toward recognition and equivalence with other standard systems. Furthermore, all three VSSs assessed have criteria related to preventing and controlling agricultural pests and diseases, which is a critical barrier to trade across the EAC.

Drawing on the findings of this report and from many discussions with local agencies, farming cooperatives, and government offices, we suggest that VSSs can provide farmers in East Africa with opportunities to transition to more climate-resilient and productive agricultural methods for the long term, particularly in light of persistent regional challenges such as pest and disease control, aflatoxin contamination, and limited access to fertilizer.

A major challenge in scaling up VSSs’ reach and benefits in the region is, however, securing the political will to support and recognize them through official channels. National agencies such as agricultural ministries and bureaus of standards, as well as EAC bodies, need to officially promote and recognize VSSs. To build this political will, VSS bodies need to continue demonstrating the “business case” for more sustainable agricultural practices through pilot projects. As such, in this report we make five recommendations for standard-setting bodies (VSSs) and three for policy-makers at the national and regional levels:

For VSS bodies:

1. Build VSS proof of concept through pilot projects; collect and share results through local and regional networks.
2. Develop partnerships with processors, distributors, buyer groups, outlets, and consumer associations.
3. Prioritize accessibility to certification for farmers.
4. Harness information technology wherever possible to accelerate the adoption of more sustainable and resilient farming practices.
5. Expand training opportunities to other participants in agricultural value chains such as national bureaus of standards, border control officials, transport professionals, and buyers.

For policy-makers in the EAC and its Partner States:

1. Demonstrate political commitment to, and recognition of, VSSs through EAC processes, events, and agricultural policy forums.
2. Communicate clearly about which standards will be supported in the region.
3. Provide targeted support for agricultural VSSs by:
 - a. Developing grant programs that enable more farmers to get certified; coordinating among participants in the value chain.
 - b. Facilitating coordination among actors (i.e., government, non-governmental organizations, VSSs, buyers, financial service providers) to help ensure that smallholders have the services and support they need to comply with VSS and buyer requirements.
 - c. Generating demand for sustainably produced products through public procurement.
 - d. Investing in research and pilot projects on how VSSs, as production standards, can lead to compliance with agricultural product standards in the region, such as sanitary and phytosanitary standards.

Abbreviations and Acronyms

AATF	African Agricultural Technology Foundation
AEM	African Eco-Labeling Mechanism
AfDB	African Development Bank
ARDP	East African Community Agriculture and Rural Development Policy
ARSCP	African Roundtable on Sustainable Consumption and Production
ARSO	African Organisation for Standardisation
CAGR	compound annual growth rate
CCP	East African Community Climate Change Policy
CIMMYT	International Maize and Wheat Improvement Centre
CMP	Common Market Protocol
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
EAGC	East African Grain Council
EAOPS	East African Organic Production Standard
EAS2013	East African Standards
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Organization of the United Nations, Statistics Division
FEWS NET	Famine Early Warning Systems Network
GHG	greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
HACCP	Hazard Analysis Critical Control Points
IFA	Integrated Farm Assurance
IFOAM	International Federation of Organic Agriculture Movements
IRRI	International Rice Research Institute
KOAN	Kenya Organic Agriculture Network
NOGAMU	National Organic Agricultural Movement of Uganda

NTB	non-tariff barriers
OECD	Organisation for Economic Co-operation and Development
PABRA	Pan-Africa Bean Research Alliance
PGS	Participatory Guarantee Scheme
SAT	Sustainable Agriculture Tanzania
SDG	Sustainable Development Goals
SMSF	small- and medium-scale farmers
SPS	Sanitary and Phytosanitary
SRP	Sustainable Rice Platform
TOAM	Tanzania Organic Agriculture Movement
UNEP	United Nations Environment Programme
VSS	voluntary sustainability standard
WEMA	Water Efficient Maize for Africa
WTO	World Trade Organization

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Introduction

This report provides an original analysis of the market and policy environment for voluntary sustainability standards (VSSs) with a presence in East Africa, focusing on the countries in the East African Community (EAC): Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda.² This is the first *State of Sustainability Initiatives* report on VSSs in a specific global region, showcasing the market performance, challenges, and opportunities for VSSs at the regional scale in a developing country context. The report focuses on VSSs' potential to enhance intraregional trade in agricultural produce, particularly staple crops, as they are among the crops most traded in this region. The primary motivation behind the report is the desire for guidance on how policy-makers at a regional level might avail of VSSs to further their development goals and ambitions for a common market and how VSSs—in turn—might leverage public policy in the region to improve their impact.

This report aims to shed light on the potential role of VSSs in addressing three major regional priorities for the EAC's agricultural sector: 1) improving agricultural productivity, 2) boosting intraregional trade, and 3) enhancing climate resilience. The report does this by analyzing the market and policy environment in which VSSs operate in EAC countries.

The report's intended audience is primarily policy-makers and producers in East Africa, but also standard-setting bodies (VSSs)

and private sector players in agricultural value chains. The report shows how policy-makers and producers in the EAC can use VSSs to their advantage since VSSs are already operating in the region and since there is an increasing awareness among consumers, buyers, and government officials of how sustainably produced goods benefit people and the environment (Maweni Farm Documentaries, 2013). In turn, the report addresses what kinds of support is needed for VSSs to be accessible, effective, and impactful in the EAC.

➤ Agricultural priority areas addressed in this report

- 1) Improving agricultural productivity
- 2) Boosting intraregional trade
- 3) Enhancing climate resilience

Section 1 of the report briefly describes VSSs, as well as the benefits they can offer for people and the environment. After outlining the opportunities that agriculture offers in East Africa, as well as the persistent challenges it faces, the section introduces VSSs' potential for boosting agricultural productivity and intraregional trade and enhancing climate resilience.

Section 2 introduces the three VSSs that are the focus of the report: GlobalG.A.P., the East African Organic Product Standard (EAOPS),

² The Democratic Republic of the Congo officially joined the East Africa Community on March 29, 2022, as the seventh Partner State.

and the Sustainable Rice Platform (SRP). It presents a market analysis of the staple crops that are among the most traded in the EAC: **maize, rice, wheat, and beans**. These crops are also essential for smallholder livelihoods and food security. This section compares conventional and VSS-compliant markets for these four commodities, providing an analysis of production, exports, and imports, as well as data on the major consumers of East African staple crops. Through a detailed analysis of the maize, beans, rice, and wheat markets within the EAC, opportunities are presented for building greater intraregional trade, as well as for improving agriculture productivity and resilience to climate change.

➤ **Four staple crops analyzed in this report**

Maize	Beans
Rice	Wheat

Section 3 focuses on the policy–VSS interface in East Africa. Policy objectives are first identified through an analysis of three major agricultural policy documents: the East African Community Agriculture and Rural Development Policy (ARDP, 2006), the Common Market Protocol (CMP, 2010), and the East African Community Climate Change Policy (CCP, 2011). The policy objectives were derived through an inductive analysis of the policies and were validated through interviews with many local stakeholders and experts. Using these regional policy objectives as a framework for analysis, Section 3 then turns to the analysis of three VSSs operating in the region—the EAOPS, GlobalG.A.P., and the SRP standard—and presents the **results of a “benchmarking” of where the**

content of these VSSs align with the EAC policy objectives. A description of our main findings is provided, and for those looking to dig into the data behind the benchmarking, our full Excel spreadsheet can be accessed through supplementary materials.

➤ **Three EAC agricultural policies analyzed in this report**

East African Community Agriculture and Rural Development Policy (ARDP, 2006)

Common Market Protocol (CMP, 2010)

East African Community Climate Change Policy (CCP, 2011)

➤ **Three VSSs analyzed in this report**

East Africa Organic Production Standard (EAOPS)

GLOBALG.A.P.

Sustainable Rice Platform (SRP) Standard

Section 4 provides forward-looking perspectives. We offer some concluding remarks, followed by recommendations based on the research and analysis developed in Sections 2 and 3. Recommendations are provided for two main target groups: VSS organizations and policy-makers at the regional and national levels of governance.

1.0 Unlocking Agriculture's Potential to Power East Africa



The Farmer Training Centre in the village of Vianzi, near the town of Morogoro, Tanzania

1.1 A Role for Voluntary Sustainability Standards

Voluntary Sustainability Standards (VSSs) have proliferated as a way of ensuring that agricultural production and trade are good for economies, societies, and the environment. There are over 300 VSSs globally, including certification schemes such as Fairtrade and Organic, corporate codes of conduct such as Starbucks' C.A.F.E. Practices program, and industry round tables such as the Round Table for Responsible Soy (International Trade Centre [ITC], 2022).

These schemes specify requirements for producers, traders, processors, and/or retailers to demonstrate that sustainable practices such as human rights protection, decent working conditions, soil health, or biodiversity conservation have been applied through product value chains. They provide information to manufacturers and retailers about production conditions and convey to prospective consumers that the product meets certain criteria that aim to address sustainability issues.

Producers, companies, industry organizations, and members of commodity round tables may use VSSs as a framework to implement sustainable production and sourcing policies and attain market recognition. In other cases, VSSs are integrated as a component of public and private sector sourcing and procurement commitments to achieve sustainable development objectives such as reducing deforestation and preventing environmental degradation.

According to the United Nations Forum on Sustainability Standards (2013), these voluntary initiatives and standards

have the potential to generate significant environmental, economic, and social benefits in developing countries when they are well implemented. Policy-makers are increasingly recognizing the potential for leveraging VSSs to achieve national development objectives (D'Hollander & Tregurtha, 2013). Indeed, in the context of ambitious environmental, social, and economic targets within the Sustainable Development Goals (SDGs), governmental and intergovernmental bodies have identified the use of VSSs as a potential opportunity for delivering sustainable development outcomes and reducing costs by combining governmental and non-governmental efforts within an effective, mutually supportive enabling environment (United Nations Forum on Sustainability Standards, 2013). Some examples include:

- The recognition of approved VSSs such as Bonsucro, the Roundtable on Sustainable Palm Oil, the Roundtable on Responsible Soy, and others, in complying with the requirements of the European Union's Renewable Energy Directive that supports the use of biofuels and energy from renewable sources (European Commission, 2021).
- The definition of Switzerland's preferential tariffs for palm oil from Indonesia complying with Roundtable on Sustainable Palm Oil, the International Sustainability and Carbon Certification (ISCC Plus), and the Palm Oil Innovation Group to support deforestation-free palm oil production.

Notable examples coming from Eastern Africa include Mozambique's national policy to become the first country certifying all its cotton production under the Better Cotton

Initiative standard (D'Hollander & Tregurtha, 2013), the adoption of VSSs as a tool to promote sustainable horticulture production (particularly roses) for export in Kenya, and the development of a regional voluntary organic standard by governments in the EAC: the EAOPS.

1.2 Agriculture Offers Major Opportunities for East Africa—But Challenges Persist

Regional integration is a priority in the EAC and is expected to boost the agricultural sector by enhancing intraregional as well as international trade. The EAC is frequently upheld as an example of a successful developing-country regional economic integration process, both in terms of what is in the agreements themselves and in terms of implementation (Gasiorek et al., 2016). This indicates that there is interest in investigating the opportunity to leverage VSSs to address challenges and achieve regional priorities.

Regional integration plays a key role in development, with the potential to increase competitiveness and interconnection for the countries in the region. Regional integration can also play a vital role in diversifying economies away from dependence on the export of just a few primary cash commodities, delivering food and climate security, generating jobs for the increasing number of young people, and alleviating poverty by delivering shared prosperity (Isik, 2016).

The economic performance of the East African region has generally been robust over the last 10 years. Considering the

COVID-19 pandemic, East Africa is the only region in Africa that avoided an economic recession in 2020, due primarily to strong agricultural performance, as well as sustained infrastructure spending and increased economic integration (African Development Bank Group [AfDB], 2021). Whereas regional GDP growth was at 5.7% in 2018, 5% in 2019, and down to 2% in 2020, regional GDP increased to an average of 5.9% in 2021 (AfDB, 2021; East African Community [EAC], 2022).

Growth in East Africa has been driven by industry and services but remains underpinned by improvements in agricultural production and sustained infrastructure investment. The agriculture sector is a primary driver of growth and is central to the region's economy (AfDB, 2021). Agriculture represents approximately 25% of GDP in the region and is a significant source of livelihood for approximately 80% of the rural population (World Trade Organization [WTO], 2019), or 109 million people (World Bank, 2018). The agricultural sector is also a major source of foreign exchange earnings and provides more than 50% of total raw materials for the manufacturing sector.

Despite this growth and the positive economic forecast for the region, all EAC Partner States except Kenya are considered least developed countries (United Nations, 2018). The region faces severe structural impediments that undermine sustainable development prospects, particularly for the rural sector, based on national income per capita, human assets (i.e., education), and economic vulnerability criteria (United Nations, 2018). The benefits of the EAC's strong growth have been uneven, and a high incidence of poverty, inequality, and unemployment



Cowpeas growing in the Msongozi village of the Mvomero district, Tanzania

persists in the region, particularly among agricultural producers and workers (Ngubula, 2017). According to the World Bank's World Development Indicators (2019), poverty levels in rural areas are higher than those in urban areas in most East African countries.

Agriculture in East Africa faces three major challenges: maintaining and improving agricultural productivity, enhancing intraregional trade, and building resilience to climate change.

1.2.1 Improving Agricultural Productivity

The low agricultural productivity of staple crops remains a challenge in the EAC countries (Karugia et al., 2013). The combination of erratic climate conditions and the high dependence on rain-fed agriculture means that crop yields can be extremely variable. Low productivity has also been

attributed to the low quantity and quality of inputs such as agrochemicals, seeds (especially high-yielding and climate-friendly varieties), farm implements and equipment, and fertilizer (World Bank & WTO, 2018). Despite some progress in recent decades, agricultural yields have not risen enough to meet the rapidly growing demands for basic food commodities, leading to food shortages and increased imports from Asia and South America (African Union Development Agency-New Partnerships for Africa's Development, 2013; Goedde et al., 2019; Sharma, n.d.). The region relies on significant imports of food staples such as maize and wheat as well as vegetable oil. While the EAC region has experienced growth in agricultural production in past decades, this has mainly resulted from an expansion of the amount of land under cultivation rather than through increases in productivity per unit of land (Karugia et al., 2013).

Food insecurity is closely related to some of the world's highest rates of undernourishment (Food and Agriculture Organization of the United Nations [FAO], 2019). An estimated 130 million people in East Africa are undernourished, and 271 million experience moderate or severe food insecurity. Agricultural workers and producers are among the most affected by food insecurity, as the majority of the poor and food-insecure population lives in rural areas and depends on agriculture as a livelihood (Garvelink et al., 2012).

1.2.2 Boosting Intraregional Trade

One of the major limitations of economic development in the EAC is the heavy reliance of its Partner States on just a few primary agricultural commodity export markets—in particular, dependence on cash crops such as coffee, tea, cotton, tobacco, and horticultural products for which markets are very concentrated, volatile, and sensitive to price fluctuations. Traditionally, sub-Saharan countries have depended on a narrow range of primary products for export. This concentration in sectors with a limited scope to increase productivity has resulted in a lack of diversity, which increases vulnerability to adverse external shocks, hence affecting export earnings and macroeconomic stability (Osakwe et al., 2018). This dependence and lack of crop diversification expose the region to several challenges, such as instability in export earnings; low farm-gate prices, which limit the access to quality agricultural inputs for farmers; constraints to farm productivity; and poor access to national, regional, and global markets due to the lack of conditions to compete with more mature and organized

actors (Sharma, n.d.). This dependency and lack of diversification also increase vulnerability to food and nutrition insecurity in the region (FAO, International Fund for Agricultural Development, United Nations International Children's Emergency Fund, World Food Programs, & World Health Organization, 2019).

While some EAC Partner States depend on cash crops for their foreign exchange earnings, and while many farmers in the region depend on cash crop exports for employment, there are equally many small-scale farmers in the region that depend on local and regional staple crop markets for their livelihoods as well as their own consumption (Organisation for Economic Co-operation and Development [OECD] & FAO, 2016b). Staple crops represent important sources of both food security and income and provide daily food calorie uptake and nutrients for people and animals (OECD & FAO, 2016b). Smallholders in the region produce 80%–90% of these crops, and many are net buyers of staples, with less than a third selling their produce (Rikolto, 2019a).

Staple crops such as maize, beans, wheat, and rice are among the most traded commodities within the EAC, and improving their production is key to ensuring future food security and securing the benefits of regional trade and integration. The crops that form the basis of diets in the region are maize, sugar cane, cassava, bananas and plantains, sweet potatoes, beans and rice, and others such as sorghum, millet, groundnut, potatoes, and oilseeds such as soybeans (EAC, 2020b; FAOSTAT, 2022; Famine Early Warning Systems Network [FEWS NET], 2019; OECD & FAO, 2016b). According to FAOSTAT data (2022), the main staple crops

Box 1. Non-tariff barriers (NTBs) to trade: An example of ad hoc import bans

An often-cited barrier to greater intraregional agricultural trade in the EAC is the use of national trade bans. Often, these bans are premised on quality and food safety concerns. For example, in March 2021 Kenya banned maize imports from Tanzania and Uganda, claiming that the mycotoxins levels (a poisonous compound produced by mould) in the maize from the two countries were above safety limits. One week later, the Government of Kenya lifted the ban, imposing stricter conditions on exporters of maize to be registered, to have a certificate of conformity on aflatoxin levels, and to produce detailed information about warehouse storage conditions.

The standardized maximum level of aflatoxin in the EAC is 10 parts per billion. It is up to each EAC country to enforce the standard.

There is debate on the extent to which trade bans are always scientifically founded. Sometimes, the problem can come from flawed or uncoordinated sampling and testing methods at the different laboratories and checkpoints. Others argue that they are often politically motivated. Trade bans like this are also known as NTBs to trade.

Source: Njeru, 2021.

produced by the EAC Partner States in 2020 were: cassava (17.1 million tonnes), sugar cane (16.5 million tonnes), maize (14 million tonnes), plantains and others (9.2 million tonnes), and sweet potatoes (8.8 million tonnes). Others among the top 10 crops in the region include rice (5.1 million tonnes) and beans (3.5 million tonnes).

According to ResourceTrade.Earth (2022), maize was the commodity most traded between EAC countries in 2020, in terms of volume, with 359,000 tonnes, followed by rice (331,000 tonnes), palm oil (171,000 tonnes), wheat (137,000 tonnes), and sorghum (101,000 tonnes). Beans have historically been among the commodities most traded

in the region, with 84,100 tonnes traded in 2020)³ (ResourceTrade.Earth, 2022).

Although the EAC has made some progress in reducing and eliminating tariffs on traded goods since 2005, NTBs continue to be one of the main obstacles to developing export commodity markets in the region (World Bank & WTO, 2018) and particularly to increasing intraregional trade (Box 1). Examples of NTBs are import bans, the difficulty and complexity of customs procedures, a lack of harmonization between trade processes and documents, limited or no recognition of certificates and rules of origin between Partner States and national standards (Laski, 2015;

³ In 2020, other agricultural products, such as milk, experienced important trade growth within the EAC (ResourceTrade.Earth, 2022).

TradeMark East Africa, 2019), migratory procedures, excessive roadside inspections, and corruption (Levard & Benkhala, 2013; TradeMark East Africa, 2019, 2020). For instance, border crossing from Burundi and Rwanda adds 4.6 hours to the trip, and trade between Uganda and South Sudan adds about USD 218 per tonne in duty and official charges to the price in local markets (FAO & United Nations Economic Commission for Africa, 2018).

Furthermore, intraregional trade remains limited by the lack of investment in rural infrastructure, such as roads, irrigation, energy, and storage. Another recognized challenge is the lack of quality inputs such as seeds and seedlings, agrochemicals, and farm equipment, usually because the prices of inputs are prohibitive to many farmers. Together, these barriers tend to increase the costs and risks for people involved in trade

and promote informal cross-border trade, creating major impediments to trade and business development in the region.

1.2.3 Building Resilience to Climate Change

Climate change is a significant challenge that affects agricultural productivity and livelihoods in the region. As a whole, the region is expected to continue warming at a faster rate than the global mean, with longer dry spells and shorter wet spells (Osima et al., 2018). Droughts are expected to get more severe due to greater evaporation (Haile et al., 2020); the agricultural sector, which is largely small-scale and rain-fed, is particularly vulnerable to drier conditions. In 2019, the region faced one of the driest seasons in recent decades; the rain deficit severely affected seed germination and overall growing conditions, causing a severe loss of crops



Separating sunflower seeds in Mvomero, Tanzania

and livestock and temporary displacement. It also led to a decline in productivity in the agricultural sector, worsening conditions for agrarian and particularly low-income households (Malhotra, 2019). Altered pest and disease patterns are also anticipated, challenging the sector's capacity to adapt to changing climate conditions (see Box 2).

Climate policies in the EAC address a range of key issues in the agricultural sector (e.g., conservation agriculture, agro-forestry, crop diversification, soil and water conservation, rainwater harvesting, and use of climate information). However, the implementation of these policies by farmers remains low due to the lack of investment at the farm and national levels, knowledge and capacity gaps on sustainable and climate-resilient agricultural practices, and poor coordination among industry actors (Njeru et al., 2016).

The FAO has observed that sustainable agricultural practices, as opposed to

conventional ones, are not being adequately incorporated into national agricultural extension training and manuals or the overall agricultural extension system in the region (Njeru et al., 2016). Similarly, national policies may not be designed with the goal of addressing the impacts of climate change on agriculture (Kornher, 2018). At the farm level, producers may not be willing to change their practices due to a range of factors, such as cost, access to finance, and access to crop insurance, which are often necessary to make investments (Muchira, 2017). Limited access to natural resources (water, land), as well as a lack of inputs (equipment, labour), knowledge, and know-how (business finance and agronomic) (Rapsomanikis, 2015) also prevent farmers from taking up new practices and technologies (Schlenker & Lobell, 2010; Thornton & Herrero, 2015). These challenges limit farmers' ability to invest in practices such as agroforestry systems, for example, which, in the long term, can provide better incomes and improve soil and product

Box 2. Agricultural pests and diseases in the EAC

The EAC region is a hot spot for many transboundary agricultural pests and diseases. Some of the most ferocious pests and diseases in the region over the past decade have been the fall armyworm, principally affecting maize and rice fields; the maize lethal necrosis disease; and the desert locust.

Agricultural pests and diseases reduce the productivity and availability of key staple and commercial crops, which many people depend on directly or indirectly in terms of food, employment, and income. The EAC Secretariat has been active in mobilizing its Partner States to ensure a coordinated response to these transboundary threats.

Access to safe and effective pesticides forms an important part of the response strategy. The harmonization of EAC pesticide management practices is an ongoing priority.

Source: EAC, 2020d.

quality, yields, and the sustainability and resilience of their production systems (Njeru et al., 2016).

1.3 Agricultural VSSs Operating in East Africa

VSSs operate at the confluence of these macro- and micro-level trends and challenges—between trade regimes and farming practices—and as such, can be seen as “meso-level” entities with the potential to bridge between the two levels. They can bring together producers, policy-makers, and private actors to work to achieve sustainability goals. VSS criteria, when well designed, well implemented, and independently verified or certified, can improve on-farm environmental, social, and economic conditions (International Centre for Trade and Sustainable Development, 2017).

VSSs can inform policy-makers in the EAC about the relevant sustainability issues facing particular sectors and commodities in the region and provide practical solutions or ways forward for improving agricultural productivity, facilitating market access for smallholders within the EAC, and building climate resilience. VSSs can provide valuable data, for example, on working conditions, production practices, environmental health, and other issues that are relevant to government reporting on, for example, the SDGs. Moreover, as VSSs come to be recognized regionally within the EAC, they may facilitate regional trade by expanding existing markets and creating new ones for VSS-compliant production and producers.

Several VSSs are already operating within the EAC—including international, regional,

and local initiatives—serving domestic, regional, and export markets. A complete list of the VSSs operational in the EAC can be found in Annex 1. According to the ITC's Standards Map, over 50 VSSs and initiatives are operating in the agriculture, agricultural products, and textiles sectors (ITC, 2021). Though their uptake is limited, Fairtrade International, Rainforest Alliance, and the Organic standards all certify crops produced on East African farms.

Regionally, the EAOPS was adopted in 2007 as a single official standard for organic agricultural production in the region that aimed to increase production and the trade of organic products in regional and global markets. National organic movements co-exist in the region, such as the National Organic Agricultural Movement of Uganda (NOGAMU), the Tanzania Organic Agriculture Movement (TOAM), and the Kenya Organic Agriculture Network (KOAN). Continent-wide initiatives are also underway, including the African Organisation for Standardisation (ARSO), African Roundtable on Sustainable Consumption and Production (ARSCP), and African Eco-Labeling Mechanism (AEM) EcoMark Africa, which was created by the African Union and includes EAC Partner States.

2.0 Market, Trade, and VSS Status of the EAC Bean, Maize, Rice, and Wheat Sectors



Women sorting through cowpea crops in the Msongozi village, rural Morogoro, Tanzania

2.1 Introduction

This section of the report focuses on the market, trade, and VSS status of the EAC bean, maize, rice, and wheat sectors. It also presents a trade perspective on the challenges and opportunities of 1) increasing agricultural productivity, 2) boosting intraregional competitiveness in trade, and 3) enhancing climate resilience.

As discussed, the agricultural sector is imperative for enabling sustainable development in the EAC Partner States, as it is essential for economic growth, development, and poverty alleviation (Ouma, 2017). Regional trade integration is a cornerstone of EAC Partner State trade policies, as it can reduce market volatility and improve food security (EAC, n.d.; OECD & FAO, 2016a).⁴ Agricultural trade accounts for over 40% of the total EAC intraregional trade, serving a market of about 146 million consumers (EAC, n.d.). Beans, maize, rice, and wheat are among the most traded agricultural commodities within the EAC, and improving their production and resilience has great potential for Partner States to further benefit from trade (Masila et al., 2016). These staple crops are also critical to maintaining livelihoods and food security in the region, particularly given that smallholders form a large part of the supply base.

The EAC Secretariat and Partner States have been working to address intraregional trade challenges, such as NTBs (described in the Introduction to this report) through various

means, such as establishing harmonized staple food standards in 2013, passing the Elimination of the Non-tariff Barriers Bill in 2015, and reducing currency disparities (Masila et al., 2016; Ouma, 2017). The East African Standards (EAS2013) were formulated to reduce technical barriers to trade by setting a common trade language and assisting producers with understanding quality and market conformity requirements for many products and services, including agricultural produce (EAC, 2011a). The standard has specifications for dry beans, maize grains, milled rice, and wheat grains that details their required level of quality, maximum contaminant limits, sanitary and phytosanitary conditions, packaging, labelling, and crop verification sampling methods.

In addition to the EAC's technical and Sanitary and Phytosanitary (SPS) measures, several VSSs operating in the EAC offer further avenues to address the aforementioned challenges and enhance intraregional trade (see Annex 1 for a full list of VSSs operating in the EAC). Organic, GLOBALG.A.P., and the Sustainable Rice Platform (SRP) are major international VSSs operating in the EAC bean, maize, rice, and wheat sectors (see Table 1), though their uptake has been limited. The EAOPS was developed locally, providing regional requirements for organic agriculture. Participatory Guarantee Schemes (PGSs), which are locally focused organic production quality assurance systems, have also been set up to make organic certification more cost-effective and accessible for smallholders.⁵

⁴ Intraregional trade accounts for 17% of Africa's exports, compared to 59% in Asia and 69% in Europe (Gandhi, 2019).

⁵ PGSs are non-hierarchical, shared ownership, and democratic structures of participating producers focused on member capacity building and accountability (Cannon et al., 2019; D'Alessandro, 2018). They allow expanding local organic markets to help producers get better prices (D'Alessandro, 2018).

Table 1. Presence of VSSs in the EAC bean, maize, rice, and wheat sectors.

Country	Sustainable Rice Platform	GLOBALG.A.P	Organic (IFOAM/EAOPS/ PGS)
Kenya		Beans	Beans, maize, wheat
Uganda	Rice		
Tanzania	Rice	Beans	Beans (PGS), maize
Rwanda		Beans	

2.2 Description of Selected VSSs Operating in the Region

The EAOPS, the SRP standard, and GLOBALG.A.P (including localg.a.p.) are the focus VSSs of this report. They are all operational in the region, either as certification programs or pilot projects. Below, we provide a description of each VSS and its current status in EAC countries.



2.2.1 East African Organic Products Standard

The EAOPS was developed in 2007 through a public–private sector partnership in East Africa between the EAC, United Nations Environment Programme (UNEP), United Nations Conference on Trade and Development, and the International Federation of Organic Agriculture Movements (IFOAM). The EAOPS was created in response to a proliferation of organic standards in the region in the late 2000s, which posed challenges to farmers that had to meet multiple requirements to

access regional or international markets for organic (UNEP, 2007). It created a unified negotiating position to help East African organic farmers access export markets and influence international organic standard setting processes (EAC, 2007; Sanches-Pereira et al., 2017). The EAOPS is the second regional organic standard in the world after the European Union’s and the first to have been developed within the cooperation of the organic movements and the national standards bodies (EAC, 2007).

The EAOPS provides a uniform set of procedures for growing and marketing organic produce in East Africa. It covers plant production, animal husbandry, beekeeping, the collection of wild products, and the processing and labelling of these products. Certified producers can use the regional organic trademark “Kilimo hai Organic,” which uses the Swahili word for “living agriculture.”

Many different crops in the EAC region have been produced in line with the EAOPS, including cereals (maize, sorghum, rice, wheat), pulses (beans, lentils, peas), vegetables, fruit, tea, coffee, and spices. Export crops such as cacao, coffee, cotton,

and tea are certified by third parties and sold in international markets. Other products are sold in local markets and may be either third-party certified or certified through PGSs. Since 2018 there has been a consolidation of various PGS groups in the East African region, where the National Organic Agriculture Movements are operating as oversight bodies. Some examples of this are organic production in Tanzania with the support of Sustainable Agriculture Tanzania (SAT) (see Box 3) and in Kenya with the support of KOAN. The EAC has 15 PGSs, six of which were operational and nine of which were under development at the time of writing. No PGSs were identified in Sudan (see Table 2 for an overview).

Within the EAC, demand for organic produce is slowly growing due to perceptions about health benefits and improved taste. Economically, farmers also recognize that input costs can be lower under organic production (no pesticides, etc.) (Gro Intelligence, 2015; Maweni Farm

Documentaries, 2013; Ngotho, 2021; Nkurunziza, 2020). An online marketplace connecting buyers and sellers of organic produce in EAC countries is available on the Kilimohai website.



2.2.2 Sustainable Rice Platform Standard

The SRP initiative was developed in 2011 as a collaboration between the

International Rice Research Institute (IRRI), UNEP, and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The SRP is now an independent member association, facilitating the adoption of best practices in sustainable rice production through three instruments: 1) the SRP Standard for Sustainable Rice Cultivation, 2) the SRP Performance Indicators for Sustainable Rice Cultivation, and 3) the SRP Assurance Scheme. The SRP standard has

Table 2. PGSs in EAC Partner States

Country	Operational PGS	PGS under development	Total
Tanzania	3	4	7
Kenya	1	0	1
Uganda	2	0	2
Rwanda	0	2	2
Burundi	0	3	3
Total	6	9	15

Source: Authors, with data from IFOAM, 2020.

Box 3. Success in PGSs in Tanzania

SAT is a national platform promoting agroecological farming practices, such as organic production. In 2010, SAT piloted Tanzania's first PGS. PGSs rely on the participation of farmers and local stakeholders to define their own production and control standards and to monitor and inspect one another. Participants in PGSs decide at the group level what is acceptable. SAT recognized that the standards being established under PGSs would be compatible with the EAOPS, and since 2012, farmers operating under PGSs have been getting certified under the EAOPS following visits by external inspectors.

SAT has supported farmer groups not only on the way to certification but also by creating market opportunities for their organic products by opening a local organic market in Morogoro, Tanzania. The market is accessible to local consumers and provides healthy food at fair prices.

As of 2021, 60 farmer groups are now certified using PGS and EAOPS licences, and over 500 groups have undergone inspection but are not yet certified.

According to SAT, farmers may prefer to participate in PGSs because third-party certification is very costly, and this is seen as an alternative to obtaining recognition for their product. The system is accessible and promotes friendship and collaboration among the farmers, as well as providing capacity-building opportunities.

Source: Interview data.

41 requirements covering a range of issues, including pesticide use, biodiversity, water management, etc.

The SRP Assurance Scheme is based on the SRP Standard for Sustainable Rice Cultivation, the world's first VSS for rice. It is underpinned by proven best practices and provides a science-based process to assess compliance. The scheme is managed by Germany-based GLOBALG.A.P., which oversees the approval of qualified verification bodies that are responsible for the inspection of producers according to the SRP standard. The Assurance Scheme offers supply chain actors a robust, cost-effective, and transparent path to sustainable procurement. On the

market, rice cultivated following practices benchmarked against the SRP standard is sold under the label "SRP Verified."

The SRP standard is already being widely used in Asia, especially in countries such as Thailand and Vietnam. In East Africa, the Rikolto organization has been undertaking pilot projects under the SRP in Uganda and supporting inclusive business development projects in both Tanzania and Uganda, generating lessons from small projects and actively building demand for sourcing rice grown under cultivation practices benchmarked against the SRP standard (see Box 4 for more details on Rikolto's work advancing the SRP). Rikolto is planning to set

up national SRP chapters in two EAC Partner States (i.e., Uganda and Tanzania). These are multistakeholder platforms that will be responsible for the development of National Interpretation Guidelines for the SRP

standard to ensure that it is relevant to the national and regional contexts and perceived as necessary, since the SRP was originally developed in an Asian context.

Box 4. Push and pull factors for sustainable rice cultivation in East Africa

In Uganda, Rikolto has been advancing sustainable rice cultivation using the SRP standard. In promoting the transition to more sustainable practices in two rice cooperatives in Eastern Uganda, they refer to “push” and “pull” factors that have incentivized farmers to make the switch.

A “push” factor in Uganda was a Presidential Directive banning rice cultivation in wetlands, which affected over 90,000 farmers. While farmers might not have otherwise chosen to change their practices and locations, this represented a “push” to smallholders and cooperatives to tweak their practices, particularly in terms of water management.

In 2018, 281 farmers from the Doho Irrigation scheme took part in the SRP pilot, and farmers’ practices notably improved over the course of the pilot. In 2019, the number of farmers participating increased to 1,281.

A “pull” factor in Uganda has been market demand. Rikolto works with retailers such as institutional buyers (schools and hotels) in Uganda. Since 2019, Rikolto has been brokering business relations between cooperatives of smallholder rice farmers in the Bulambuli district (Taabu Integrated Cooperative Society Limited and Bunambutye ACE) and SWT, a company engaged in rice processing and distribution across Uganda.

Rikolto participated in the preparation of the Ugandan Government’s National Rice Development Strategy for the period 2021–2030, which recognizes the use of the SRP standard. This public sector endorsement goes a long way in getting farmers to trust and follow it.⁶

Sources: Interview data; Rikolto, 2019a, 2020c.

⁶ At the time of preparation of the report, Uganda’s national rice development strategy for the period 2021–2030 had not yet been validated by the wider rice stakeholders and was not yet published.



Top: Maize crops in Mvomero, Tanzania; Left: Maize farmer Seleman Mnyate in Kinyanze Village, Mvomero district, Tanzania; Right: Processing maize grains into flour at the Farmer Training Centre in Vianzi villiage, Tanzania



2.2.3 Global G.A.P and localg.a.p.

GLOBALG.A.P. (“Good Agricultural Practices”) was established in 2007, following two decades of development under EUREPGAP—an initiative by British retailers working together with supermarkets in continental Europe who became aware of consumers’ growing concerns about product safety, environmental impact, and the health, safety and welfare of workers and animals.

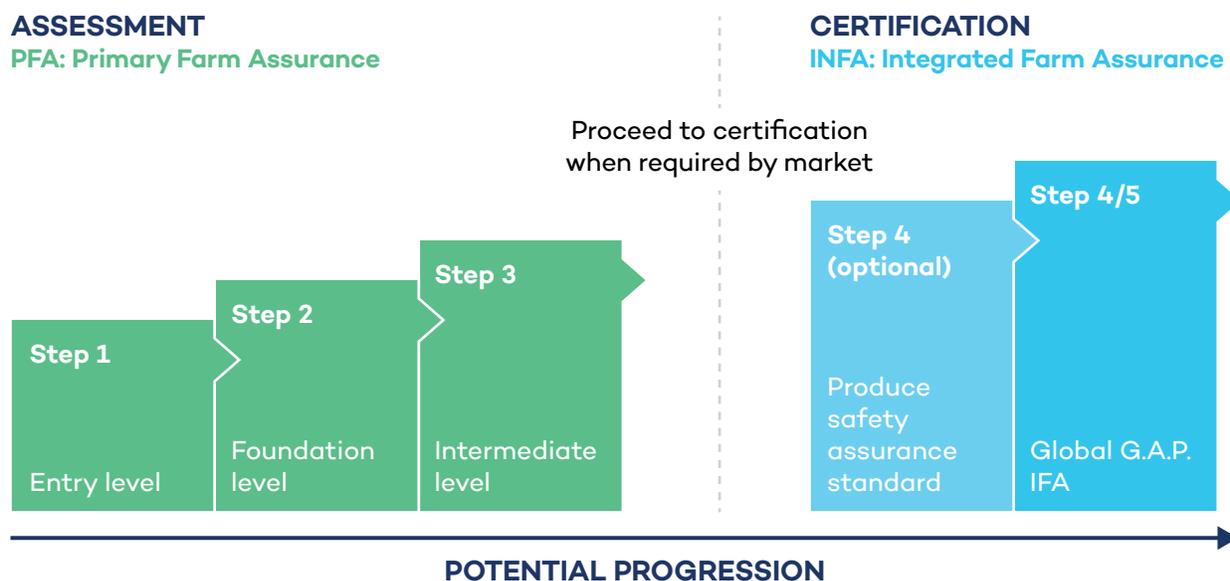
GLOBALG.A.P. is a private sector body that sets voluntary standards for the certification of agricultural products around the globe. GLOBALG.A.P. certification covers food safety, workers’ health and safety, and environmental sustainability. GLOBALG.A.P. currently operates in 135 countries.

Localg.a.p. is one of the brands designed by GLOBALG.A.P. to be used as a capacity-building tool and applied using a “building block” approach, with “entry,” “foundation,” and “intermediate” levels to prepare emerging or smallholder producers for certification.

It enables producers to enter certain agricultural supply chains with a system of assessment called Primary Farm Assurance (PFA) but without formal certification. Formal certification, called Integrated Farm Assurance (IFA), can be obtained when producers are ready and have identified the market demand. Figure 1 outlines the potential steps that producers can take toward obtaining the GLOBALG.A.P. IFA certification for export markets.

GLOBALG.A.P. is operational in the East Africa region for the export market, covering 1) flowers and ornamentals, 2) fruit and vegetables, 3) combinable crops (including rice, beans, maize), 4) livestock, and 5)

Figure 1. Potential progression from localg.a.p. (PFA) to GLOBALG.A.P (IFA) certification



Source: GLOBALG.A.P., n.d.-b.

plant propagation materials. The localg.a.p. standards are currently operational in South Africa, Mozambique, Nigeria, and Namibia but not yet in the East African region. However, at the time of writing, an initiative by GLOBALG.A.P. Kenya was underway to implement localg.a.p. in EAC Partner States. There is a perception that it may be better adapted to local and regional conditions, with lower startup costs, and that it could facilitate food safety, harmonization, and potentially greater productivity in the region.

2.3 Commodity Profiles: Beans, maize, rice, and wheat

In this section, the market status, trade, challenges, and initiatives in the EAC beans, maize, rice, and wheat sectors are examined to derive market insights for improving intraregional and international trade. The presence of VSSs is given particular attention within each sector to ascertain their potential for enabling more sustainable and resilient agriculture in the EAC.

2.3.1 Beans

The EAC is the third-largest bean producer in the world (when excluding soybeans), after Myanmar and India (Kilimo Trust, 2017a). The total EAC area under bean production was approximately 4 million ha, which yielded a little over 4 million tonnes in 2019 (FAOSTAT, 2022). Beans are extensively

traded within and outside the EAC, generating a value of USD 117 million from almost 0.3 million tonnes of exported beans in 2019 (FAOSTAT, 2022). From 2015 to 2019, the majority of EAC bean exports (67%) were traded between EAC Partner States, while the balance (33%) was exported outside the EAC. Bean exports across EAC Partner States seem to be growing: they experienced a compound annual growth rate (CAGR) of 3% from 2015 to 2019. Intraregional bean trade between Uganda, Kenya, and Tanzania captures the majority of the EAC bean exports.

Consequently, beans are important for rural livelihoods, farmers' income, and food security in the EAC (Birachi et al., 2011; Larochelle & Alwang, 2014). The per-capita consumption of beans in the EAC is estimated to be the highest in the world at 45 kg/capita; approximately 41% of the population consumes beans as an affordable source of nutrition (Kilimo Trust, 2017a).^{7,8} Cultivating beans has become popular among farmers, as they can provide bumper crops up to three times a year, enhance soil fertility, be intercropped with maize, cassava and banana, and be stored without deteriorating (Onyimbo, 2017; Pan-Africa Bean Research Alliance [PABRA], 2015). Beans are grown by more than three million Kenyan households, the majority of whom are small-scale farmers (Katungi et al., 2009). The growth of specialized niche bean markets and urban populations has contributed to expanding the market (PABRA, 2020).

⁷ Bean consumption per capita in the EAC is estimated to be the highest in the world at 45 kg/person compared to 3 kg/person in the United States (Kilimo Trust, 2017a). It is estimated that people in western Kenya, Rwanda, and Burundi eat their body weight in beans every year (around 50–60 kg) (PABRA, 2020).

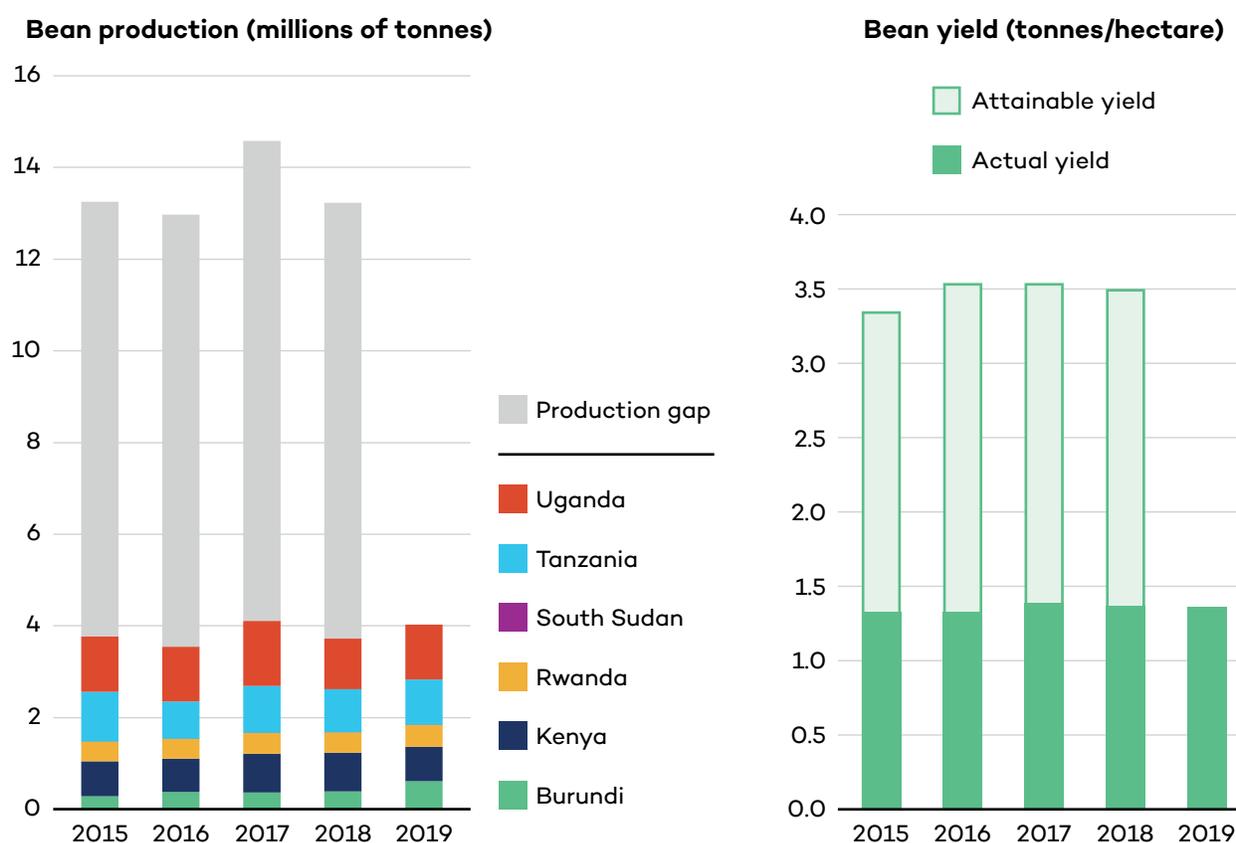
⁸ USD 1 spent on beans provides 319 g of protein, 101 mg of iron, 38 mg of zinc, and 336 g of fibre while USD 1 spent on beef provides 48 g of protein (Kilimo Trust, 2017a).

As shown in Figures 2 and 3, Uganda is the largest bean producer and exporter in the EAC, followed by Tanzania. While Uganda and Tanzania are net bean exporters, Kenya supplies only 46% of its bean demand, making it the biggest market in the region (Kilimo Trust, 2017a) (see Figure 3). The bean volumes exported by EAC Partner States have generally been increasing since 2015. Current yields remain significantly lower than estimated attainable yields, which, if realized, could eliminate EAC bean importation needs

and significantly increase its exportation potential (Mueller et al., 2012).

All EAC Partner States, except for South Sudan, export beans to countries outside of the EAC. Based on bean imports averaged between 2015 and 2019, India is the largest importer of EAC beans outside of EAC Partner States (49,211 million tonnes [Mt]), followed by Pakistan (19,181 Mt), the United Arab Emirates (17,235 Mt), the Democratic Republic of the Congo (4,443 Mt), and Bangladesh (2,324 Mt).

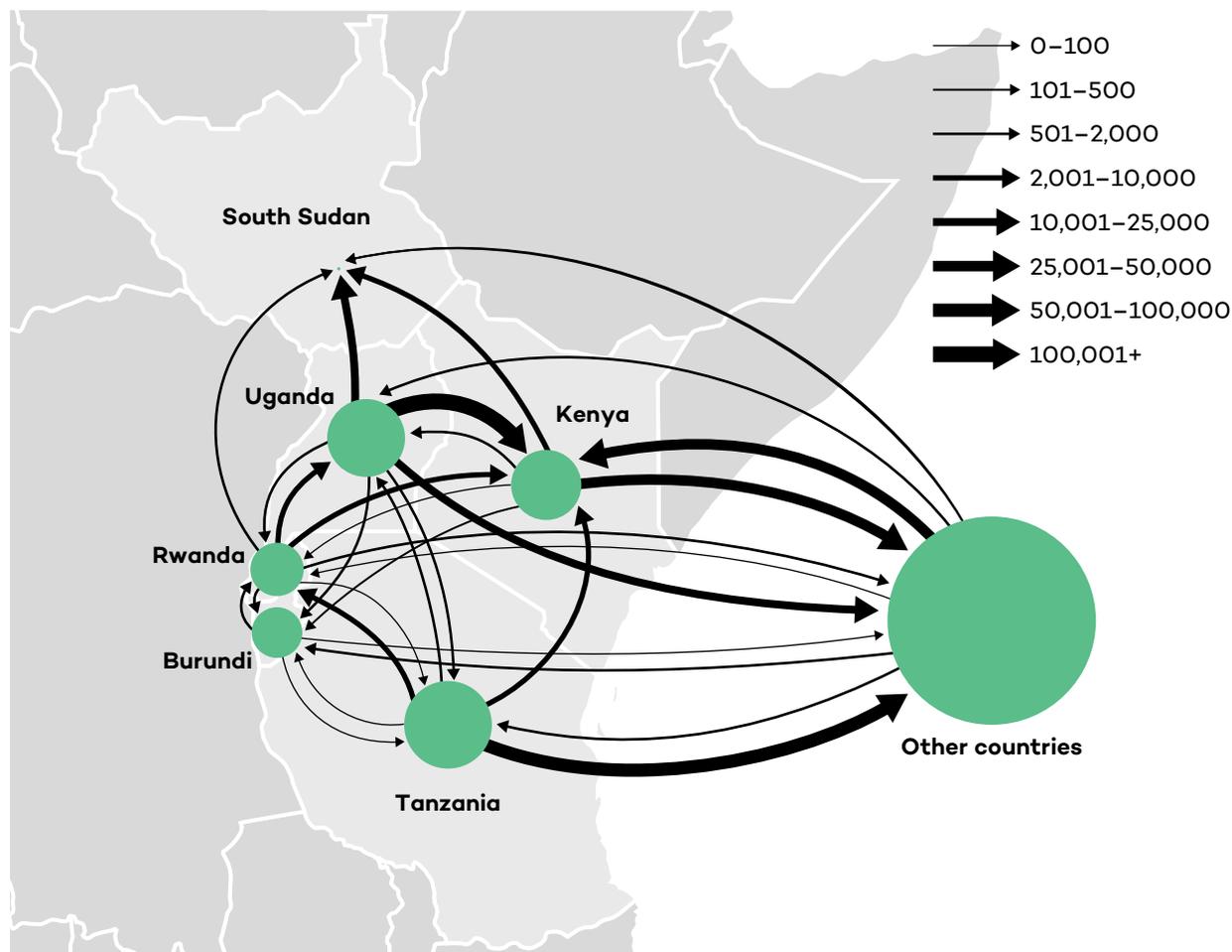
Figure 2. EAC bean production



Note: Production gaps were estimated based on attainable yield estimates; “Attainable yields are estimates of feasible crop yields calculated from high-yielding areas of similar climate. They are more conservative than biophysical ‘potential yields’ but should be achievable using current technologies and management (e.g., fertilizers and irrigation). Attainable yields are based on assessments for the year 2000. Attainable yield pre-2000 may be lower; and post-2000 may be higher than these values” (Mueller et al., 2012, p. 254).

Data source: FAOSTAT, 2022; Our World in Data, n.d.

Figure 3. EAC beans averaged trade volumes in tonnes, 2015–2019



Note: Country nodes are sized based on relative production levels, and the arrows are sized based on exports in tonnes.

Data source: FAOSTAT, 2022.

Although beans are evolving from a subsistence to a market-oriented crop, the associated benefits of this shift are still not felt in many parts of Africa due to relatively low productivity levels (Birachi et al., 2011). Common bean cultivation challenges in the EAC include limited access to agricultural inputs such as improved varieties, erratic and poorly distributed rainfall, declining soil fertility, pests and diseases, and a lack of suitable storage areas. Many of these

challenges are further exacerbated by climate change (Mahrous, 2019). The majority of farmers rely on their own seed, and private sector involvement in legume seed markets remains low and poorly developed. Although improved bean varieties exist, many farmers are not aware of them and do not use them (FAO, 2015a). Moreover, there are also issues in identifying buyers, who may have strict requirements, which can become a trade barrier for farmers who cannot meet them

(Wanjala et al., 2019). Most farmers across the EAC cultivate beans before they identify buyers (Wanjala et al., 2019). A sustainable bean value chain strategy is required in the EAC, and innovative approaches, such as VSSs, could assist bean farmers in improving their productivity, climate resilience, and market access.

The GLOBALG.A.P and Organic standards are the main VSSs operating in the EAC bean sector, though adoption among producers remains low. Approximately 215 ha in Kenya and 3 ha in Tanzania were dedicated to cultivating organic beans in 2018 (Willer et al., 2021). PGS certification in Tanzania (overseen by the Tanzania Organic Agriculture Movement) has gained momentum for exporting organic dry pulses; Tanzania cultivated approximately 51,000 ha of organic pulses in 2016 (Willer et al., 2020). GLOBALG.A.P has been actively certifying bean farmers in Kenya, Tanzania, and Rwanda, helping them improve their market access, transaction transparency, price stability, and productivity (GLOBALG.A.P., n.d.-a). Over the last decade, the area dedicated to growing GLOBALG.A.P certified beans in Kenya and Tanzania represented less than 1% and little more than 0.05% of the total area used to grow beans in the respective countries. The agricultural land used for producing GLOBALG.A.P.-certified beans in Kenya and Tanzania, respectively, peaked at approximately 8,200 ha in 2018 and 562 ha in 2014.

Organizations working on improving the EAC bean sector include PABRA, Rikolto, and

Kilimo Trust. PABRA has developed more resilient, nutritional, and marketable bean varieties, which will be crucial to transitioning EAC beans to a modern commodity (Birachi et al., 2011; Rubyogo et al., 2010; Snapp et al., 2018). The Rikolto Food Trade project implemented between 2016 and 2018 aimed at increasing the incomes of farmers that grow maize, rice, and beans by improving post-harvest storage and handling as well as trade and market access via enhanced farm management, documentation, and distribution (Rikolto, 2019a).⁹ The Kilimo Trust BEST-EAC project aims to expand structured trade and incomes for 10,000–15,000 small- and medium-scale farmers, who collectively produce 30,000 Mt of beans per year (Kilimo Trust, 2017a). In addition to these efforts, the Regional Economic Communities within African states, such as the Common Market for Eastern and Southern Africa (COMESA), are facilitating intra-African trade and have improved the African bean value chain and market (UNCTAD, 2018b).

2.3.2 Maize

Maize is an important food staple and is the most widely traded agricultural commodity within the EAC, and thus is an important source of income for farmers (FEWS NET, 2019; OECD & FAO, 2016a; World Bank, 2012).¹⁰ The total EAC area under maize production in 2019 was approximately 7.2 million ha, which yielded close to 13 million tonnes (FAOSTAT, 2022). Maize is extensively traded between EAC Partner

⁹ Rikolto reported that farmers received 12% higher prices due to improved product quality and collective bargaining (Rikolto, 2019a).

¹⁰ The African continent accounts for 30% of the world's maize consumption (Modor Intelligence, 2019).

States, and exports amounted to almost 13 million tonnes, generating a little less than USD 124 million in 2019 (FAOSTAT, 2022). From 2015 to 2019, the vast majority of EAC maize exports (94%) was traded within the EAC, while the balance (6%) was exported outside the region. EAC maize exports experienced a CAGR of 13% from 2015 to 2019. Tanzania is the largest maize producer in the EAC and, along with Uganda, it is also the largest maize exporter; Kenya is the largest importer (see Figures 4 and 5).

Maize is typically consumed either as green maize or after processing in the form of maize flour or meal (Daly et al., 2016). Maize is the most consumed crop in Kenya and Tanzania and is gaining more prominence in Ugandan and Rwandan diets.¹¹ For this reason, it is expected to continue dominating cereal production and consumption in the EAC through 2025 (OECD & FAO, 2016a). Maize is particularly important for the poor, as it provides an accessible source of nutrition and livelihoods. Its cultivation is dominated by smallholder farmers in Uganda and Rwanda, and the majority of Kenyan small-scale producers grow maize for home consumption (about 50% of production), selling the balance (Daly et al., 2016; FAO, 2015c). Domestic maize production contributes over 50% of the grain supply in most of the EAC countries but less in South Sudan, where it contributes from 9% to 33% (Daly et al., 2016; FEWS NET, 2019).

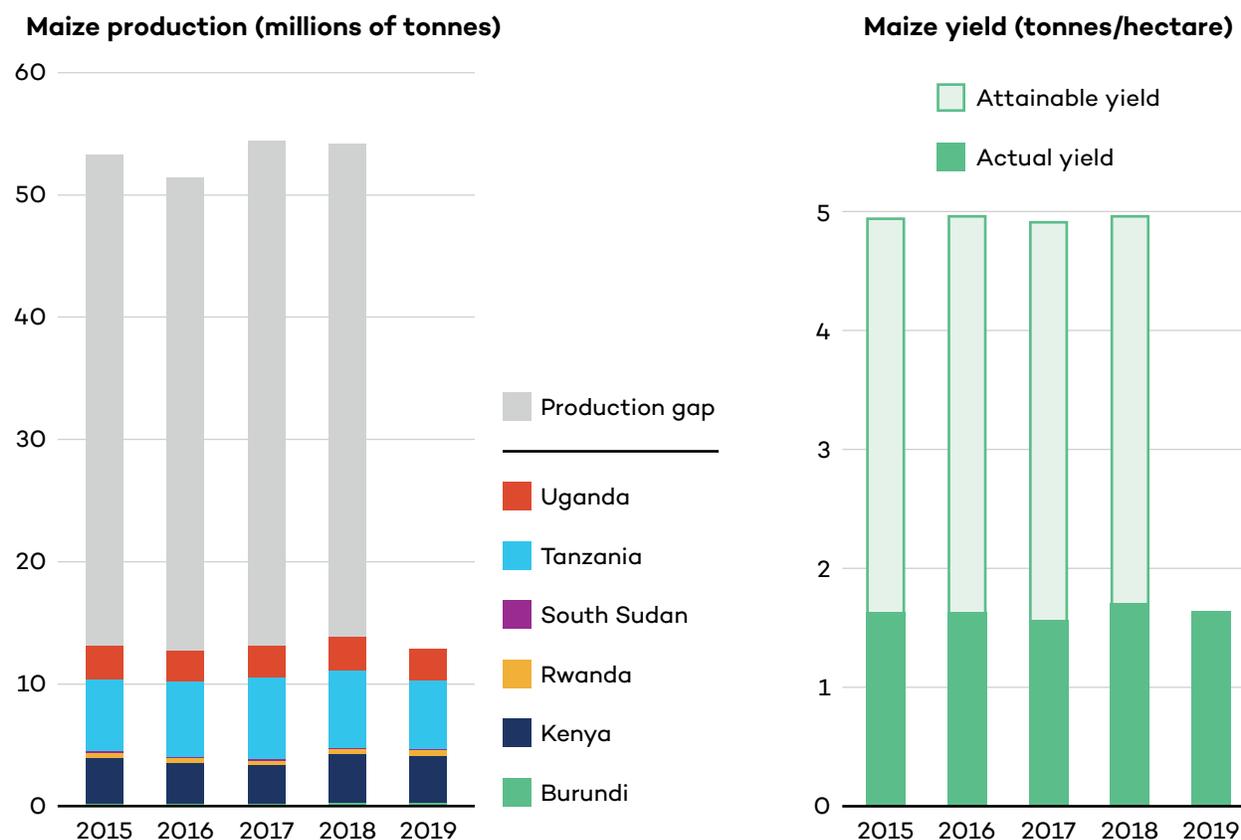
The East African region usually produces 1 million Mt of tradable maize surplus annually. It is estimated that approximately

80% of this production is sold within the EAC through non-taxable channels in order to avoid exportation and marketing costs (Daly et al., 2016; FEWS NET, 2019; World Bank, 2012). The World Bank (2012) estimates that marketing costs between farm-gate and capital wholesale markets averaged USD 54 per tonne in Uganda, USD 80 per tonne in Kenya, and USD 91 per tonne in Tanzania. Non-tariff measures also increase the transportation costs of agricultural goods to market.¹² For example, Kenya's non-tariff measures can cost an additional USD 7.2 per tonne for agricultural goods crossing its borders (World Bank, 2012).

Kenya is the largest maize market and importer from EAC and non-EAC Partner States (Daly et al., 2016). For this reason, Kenyan maize processors and traders have significant influence in the EAC maize value chain, requiring suppliers and upstream actors to adhere to Kenyan or EAC quality standards. Uganda is a major maize producer and the largest maize exporter, sending much of its surplus to Kenya (Daly et al., 2016). Current yields remain significantly lower than estimated attainable yields, which, if realized, would eliminate importation needs and increase exportation potential (Mueller et al., 2012). Based on reported maize imports averaged from 2015 to 2019, the largest EAC maize importers outside of the Partner States are Zimbabwe (14,993 Mt), followed by Malawi (3,991 Mt), the Democratic Republic of the Congo (1,904 Mt), Ethiopia (267 Mt), and Seychelles (200 Mt), which mostly share a border with EAC countries.

¹¹ Uganda's maize consumption went from 203 to 344 kilocalories per person per day between 2007 and 2011, and Rwandan government food security programs have increased maize production over the last decade (Daly et al., 2016).

¹² These can also include bribes and delays at roadblocks and weighbridges (World Bank, 2012).

Figure 4. EAC maize production

Note: Production gaps were estimated based on attainable yield estimates; “Attainable yields are estimates of feasible crop yields calculated from high-yielding areas of similar climate. They are more conservative than biophysical ‘potential yields’, but should be achievable using current technologies and management (e.g. fertilizers and irrigation). Attainable yields are based on assessments for the year 2000. Attainable yield pre-2000 may be lower; and post-2000 may be higher than these values” (Mueller et al., 2012, p. 254).

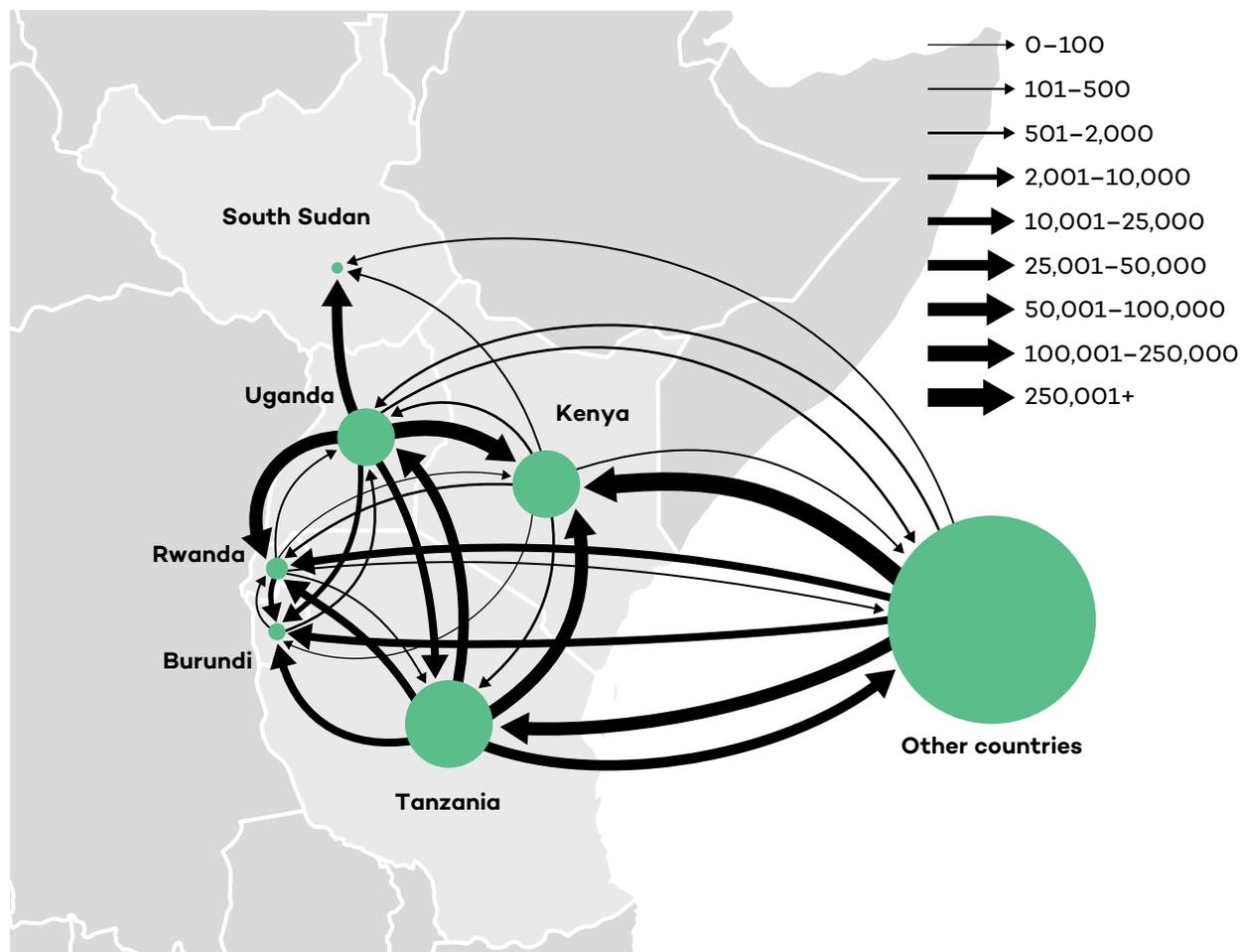
Data source: FAOSTAT, 2022; Our World in Data, n.d.

The EAC maize sector faces multiple challenges, such as low productivity, climate change, and trade barriers. Maize farmers have limited access to quality agricultural inputs such as seeds and fertilizers, as well as warehousing and storage capacity. The high occurrence of pests and diseases such as parasitic weeds and insect infestations pose constant challenges (Daly et al., 2016; International Plant Biotechnology Outreach,

n.d.). For example, stemborers reduce Kenyan maize production by an average of 400,000 tonnes per year (13% of total production), representing an approximate loss of USD 90 million (AATF, 2021b, 2021c). Aflatoxin contamination can result in illness and fatalities (Jerving, 2020; Nabwire et al., 2020);¹³ as such, addressing this challenge is a political priority in the EAC (see Box 5).

¹³ Kenya and Tanzania, respectively, experience fatality rates of 40% and 50% for people affected by aflatoxin-contaminated grain (Jerving, 2020).

Figure 5. EAC maize averaged trade volumes in tonnes, 2015–2019



Note: Country nodes are sized based on relative production levels, and the arrows are sized based on exports in tonnes.

Data source: FAOSTAT, 2022.

Maize is also susceptible to climate change impacts, as it is highly dependent on rain (FAO, 2018b). A lack of reliable precipitation and unsustainable farming practices can result in 40%–50% production losses, which harm food and nutritional security in the EAC (De Groote et al., 2013; International Plant Biotechnology Outreach, n.d.) and farmers’ income. Temperatures have already exceeded optimal levels for lowland tropical maize (34°C) in several

countries, including Sudan (Vlaams Instituut voor Biotechnologie, 2017).

The maize sector is also marked by unsuccessful government programs, low compliance with regional standards, and private sector segregation (Daly et al., 2016). For instance, although the Ugandan government included maize as part of its 2015 Development Strategy and Investment Plan, implementation suffered from a lack

of institutional support and the potential for undermining the interests of the elite (Daly et al., 2016). While harmonized maize standards have been established by EAC Partner States, adherence to them has been uneven, resulting in a trade barrier (Daly et al., 2016). Failure to comply with agreed SPS standards is due to the following factors: 1) lack of food safety consumer awareness, 2) consumer sensitivity to higher prices driven by standard compliance, and 3) government's inability to publicize, test, or enforce the standards in value chains (Daly et al., 2016). A lack of coordination among private sector players further complicates the situation (Daly et al., 2016).

Although the organic standard is the main VSS operating in the maize sector in the

EAC, its adoption remains low among producers. Approximately 214 ha in Kenya, 2 ha in Rwanda, and 10 ha in Tanzania were dedicated to cultivating Organic-certified maize in 2018 (Willer et al., 2021). Most African farmers produce maize in accordance with the Organic standard farming requirements without costly certification. PGSs have been set up to support farmers practicing organic farming by building local organic markets, which is promising due to growing domestic demand, the large informal organic sector, and favourable institutional frameworks that recognize PGSs as valid assurance systems (D'Alessandro, 2018).

Notable initiatives to improve the EAC maize sector include Water Efficient Maize for Africa (WEMA), the African Agricultural

Box 5. EAC coordination on aflatoxin contamination

Aflatoxin contamination poses a serious threat to human and animal health and represents a barrier to greater market integration in the EAC region. Tackling this crop contamination issue—caused by too much humidity in the storage of maize, wheat, beans, and other crops—has been a policy priority for EAC officials. Following several years of meetings and coordination, in 2018, the Council of Ministers approved the *EAC Aflatoxin Prevention and Control Strategy and Action Plan (2017–2022)*. The strategy and action plan aims to establish a harmonized approach across the region to prevent and control aflatoxin contamination along value chains.

In 2020, the EAC Secretariat published a report taking stock of progress to date. Examples of progress made in EAC Partner States include training public health officers in aflatoxin detection and management; commissioning laboratories for detection; purchasing and distributing technology for drying crops post-harvest; and applying products such as “aflasafe” to prevent contamination. Barriers that remain include enforcement of prevention measures, communication in Partner States, and incentives for private sector participation in addressing the challenge, for example, through the use of aflasafe.

Sources: EAC Secretariat, 2020.

Technology Foundation's (AATF) project called "TELA" (which comes from the Latin word *tutela*, meaning protection), Drought Tolerant Maize for Africa, the TAAT Maize Compact, and the Accelerating Genetic Gains in Maize and Wheat for Improved Livelihoods projects. These efforts primarily focus on developing and distributing improved maize varieties (i.e., climate resilient, pest and disease resistant, healthier and higher yielding) but also providing extension services for sustainable farming, establishing local seed systems and competitive seed markets, and enabling knowledge exchange and innovation platforms (AATF, 2021b, 2021c; International Maize and Wheat Improvement Centre [CIMMYT], 2020a; Muinga et al., 2019; Sustainable Intensification of Maize-Legume Systems for Food Security in East Africa, 2011). The cultivation of the climate-smart Drought TEGO variety, developed and distributed by the WEMA project, improved food security in Kenya (Muinga et al., 2019). The TAAT Maize Compact project will bring water efficiency technologies to 2 million households, assist 12 million farmers in benefiting from climate-smart maize technologies, and distribute 30,000 tonnes of climate-smart maize seeds (Technologies for African Agricultural Transformation, 2020).

2.3.3 Rice

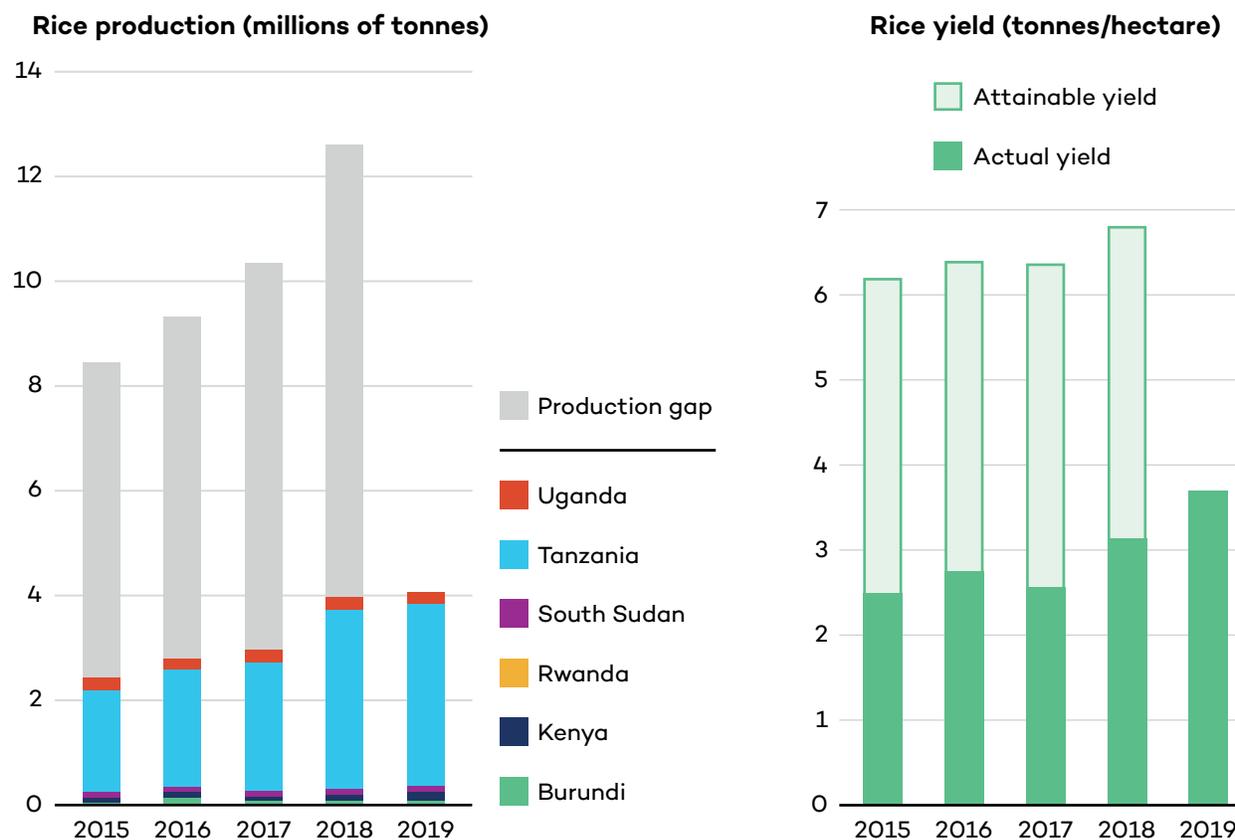
The total EAC area under rice production was approximately 1.2 million ha, yielding almost 4 million tonnes of rice paddy in 2019 (FAOSTAT, 2022). EAC rice paddy (milled rice equivalents) exports amounted to 0.12 million tonnes, generating almost USD 68

million in 2019 (FAOSTAT, 2022). From 2015 to 2019, EAC rice paddy (milled rice equivalents) were exported almost evenly between (49%) and outside (51%) EAC Partner States. EAC rice paddy (milled rice equivalents) exports experienced a CAGR of 8% from 2015 to 2019. Intraregional EAC rice exports are constrained by limited surpluses and low production competitiveness, rendering it more expensive compared to competitors (Kilimo Trust, 2017b). Tanzania is the largest rice producer and exporter in the EAC, while Uganda is the largest importer, as it re-exports rice from Tanzania to South Sudan (see Figures 6 and 7) (Kilimo Trust, 2017b).

Rice is particularly important for food security in Tanzania, Kenya, and Uganda, where there is a high level of per-capita consumption (Rikolto, 2020b).¹⁴ Consumption in Kenya and Uganda exceeds local production, making them significant rice importers. Rice consumption in the EAC as a whole has grown at a rate of 5% from 2006 to 2016 to 3 million Mt. This growth was driven by an increasing population, a rising middle class with higher disposable incomes, and farmer consumption. Rice production in the EAC, which is dominated by smallholder farmers, increased at a rate of 11% between 2006 and 2016, mainly due to expanding its production area (Kilimo Trust, 2018; Rikolto, 2020b). Donors have also invested in irrigation projects due to the sector's growth potential (Rikolto, 2020b).

The strategic importance of rice is reflected by EAC's national rice development strategies, which aim to increase production

¹⁴ The average rice consumed in Tanzania, Kenya, and Uganda is 25.8 kg, 14 kg, and 8 kg per person, respectively (Rikolto, 2020b).

Figure 6. EAC rice paddy production and rice paddy (rice milled equivalent)

Note: Production gaps were estimated based on attainable yield estimates; “Attainable yields are estimates of feasible crop yields calculated from high-yielding areas of similar climate. They are more conservative than biophysical ‘potential yields’, but should be achievable using current technologies and management (e.g. fertilizers and irrigation). Attainable yields are based on assessments for the year 2000. Attainable yield pre-2000 may be lower; and post-2000 may be higher than these values” (Mueller et al., 2012, p. 254).

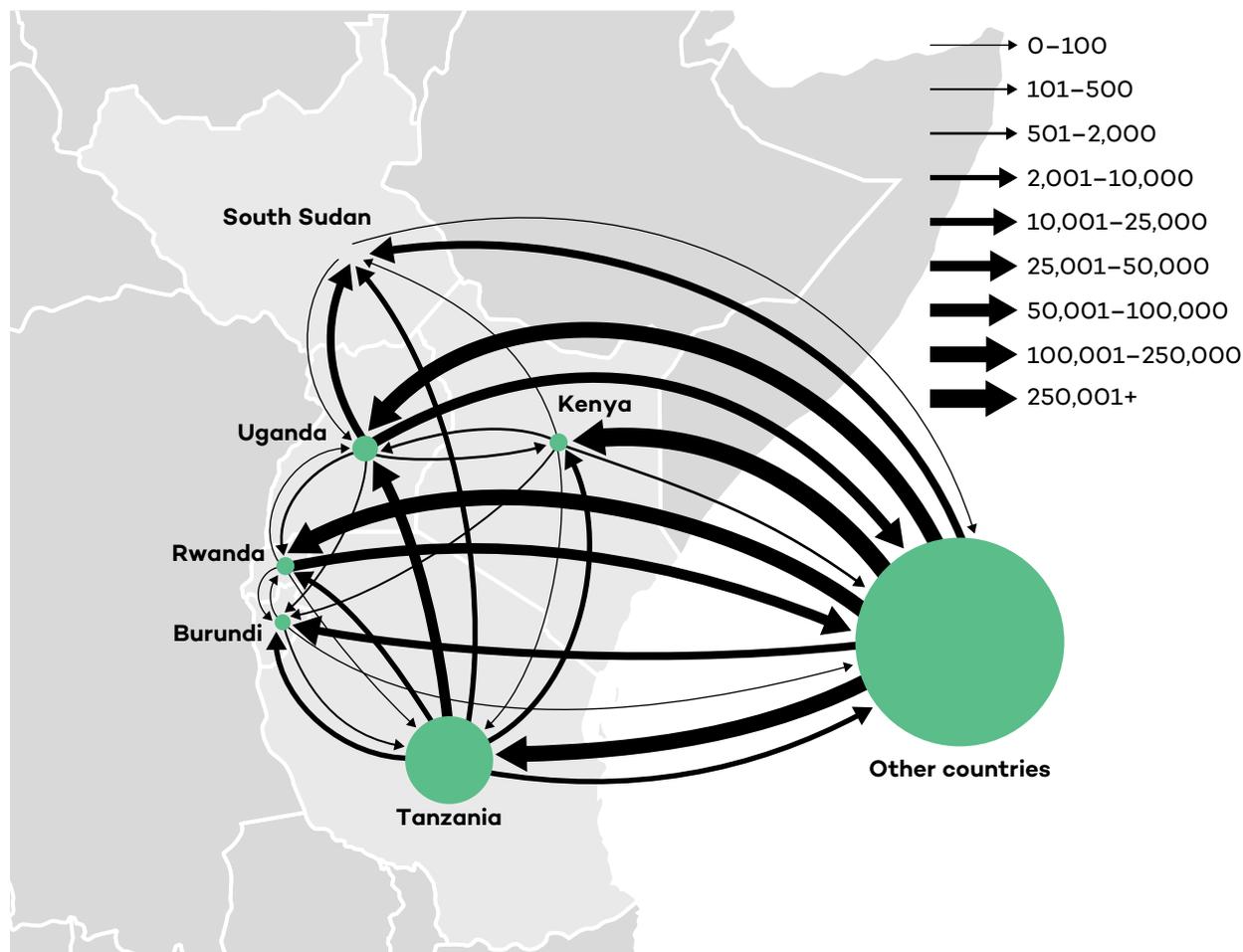
Data source: FAOSTAT, 2022; Our World in Data, n.d.

and productivity to become self-sufficient and increase exportation (Atera et al., 2017). The Tanzanian and Ugandan governments have recognized the importance of developing their rice sectors and protecting them by imposing a 75% tariff on imports from outside of the EAC, while Kenya has imposed a 35% tariff

(Rikolto, 2020b).¹⁵ They are also investing in promoting new varieties, mechanization, and new irrigation schemes (Rikolto, 2020b). Nevertheless, EAC rice farmers will require support to improve their productivity, climate resilience, post-harvest handling, milling and trading, and access to regional markets.

¹⁵ Despite the existence of a 75% common external tariff on rice imports from outside the EAC to protect producers against cheaper Southeast Asian rice, there have been instances where Asian rice has been smuggled into domestic and regional rice markets by blending and marketing it as EAC rice (Masila et al., 2016). Due to this lack of origin assurance, EAC Partner States have maintained tariffs on all rice imports (Masila et al., 2016).

Figure 7. EAC rice paddy (rice milled equivalent) averaged trade volumes in tonnes, 2015–2019



Note: Country nodes are sized based on relative production levels, and the arrows are sized based on exports in tonnes.

Data source: FAOSTAT, 2022.

Doing so could enable rice farmers and traders to cash in on expanding demands.

Although current yields remain lower than attainable yields, they have increased in recent years (Mueller et al., 2012). Realizing attainable yields could significantly increase the EAC’s rice exportation potential. The current EAC rice export market outside of its Partner States is relatively small and primarily limited to other African countries. Rice

imported from outside the EAC is mainly from Pakistan (156,954 Mt), followed by Thailand (38,728 Mt), India (4,933 Mt), and Vietnam (3,741 Mt) (based on reported rice imports averaged between 2015 and 2019).

The EAC rice sector faces significant challenges, even though it has gone through important improvements, particularly in Tanzania and Uganda (Rikolto, 2020b). Despite having adequate land and water

resources, rice productivity is low, and large areas of suitable land remain uncultivated (IRRI, n.d.; Kilimo Trust, 2018). This is mainly due to the use of low-yielding rice varieties, unreliable farming input supply systems, pests and diseases, poor water and weed management, and limited-use technologies for on- and off-farm operations (Kilimo Trust, 2018; Otenga & Annab, n.d.). Farmers also do not have access to modern post-harvest techniques and machinery, and there is a general lack of knowledge among smallholder farmers to meet the rice quality demanded by consumers (IRRI, n.d.). At the processing level, milling, storage, warehousing, and mechanization services are poor in the region. All these challenges result in high production costs and variable product quality, which limits the competitiveness of the EAC rice sector (Rikolto, 2020b).

Climate change also threatens rice production in the EAC due to extreme weather conditions like droughts, floods, and heat waves (IRRI, n.d.). Approximately 80% of rice production systems in the EAC are upland and lowland rain-fed rice, which are particularly susceptible to heat stress and drought (Adhikari et al., 2015). Mild droughts can significantly reduce yields, and even a 1°C temperature increase above normal can negatively affect production (Adhikari et al., 2015). It is estimated that Kenya, Rwanda, Tanzania, and Uganda will experience a 16% drop in rice production by the end of the century due to climate change (Adhikari et al., 2015). Rice production can also be an important greenhouse gas (GHG) emitter, as traditional cultivation methods, such as burning rice straw, releases

carbon dioxide; the flooding of paddy fields represents approximately 10% of global methane emissions (Rikolto, 2020b). Synthetic fertilizers, which are overused in Tanzania and underused in Uganda, can also be an important source of GHG emissions (Rikolto, 2020b).

Enabling a more sustainable and resilient rice sector in the EAC represents an important opportunity to meet growing rice demands (IRRI, n.d.). The SRP provides training to enable more climate-resilient rice cultivation (SRP, 2020). SRP performance indicators, such as on water use, food safety, and yields, allow for monitoring the sustainability impacts of adopting sustainable rice cultivation practices by farmers (SRP, 2020). The SRP standard has been actively implemented in Uganda and Tanzania since 2018 through SRP members such as Rikolto. Rikolto has supported farmer training and coaching sessions on water use for irrigation and fertilizer use, among others (Rikolto, 2020b). Rikolto has also supported youth growing rice following the system of rice intensification approach, with skills development on the use of the SRP standard. By practicing the system of rice intensification, farmers can increase their yields from 18 to 36 bags per acre, reduce seed and fertilizer costs, and decrease GHG emissions (FAO, 2018a; Rikolto, 2020b; Vidal, 2019).¹⁶

Other organizations working to improve the EAC rice sector include AfricaRice, the IRRI, and Kilimo Trust. These initiatives are focussed on increasing the productivity, profitability, and sustainability of the EAC rice sector. AfricaRice is working on poverty

¹⁶ One bag of rice is equivalent to approximately 120 kg (FAO, 2018a).

Box 6. Building the competitiveness of EAC rice in the region

The East Africa Common Market imports over USD 300 million in rice each year. In order to competitively substitute some of this imported rice for domestic rice, increasing local incomes and trade competitiveness, the Kilimo Trust NGO and the EAC Secretariat are implementing a 3-year project (2019–2022), the Competitive African Rice Initiative.

Project activities centre around enhancing rice production in Tanzania, Uganda, and Kenya by encouraging the use of specific rice seed, Saro 5, for improved yields; encouraging responsible fertilizer use; and enhancing farm business strategies.

The project also involves setting up an EAC Regional Rice Platform for public and private representatives from all six EAC Partner States and providing input to an eventual EAC rice development strategy. Project partners have identified the following NTBs affecting the rice trade in the region: 1) lengthy bureaucracy, 2) incompetent implementation of SPS procedures, 3) awareness of rules on packaging, 4) ad hoc export and import bans, 5) lack of foolproof verification of Rules of Origin, and 6) frequent remissions under the EAC common external tariff.

Source: Coalition for African Rice Development, 2021; Kilimo Trust, 2021.

alleviation, food and nutrition security, and farming livelihoods within rice value chains (AfricaRice, n.d.). The IRRI develops and deploys climate-resilient and market-competitive rice varieties, which have been delivered to more than 18 million farmers in Africa and South Asia (IRRI, n.d.). Kilimo Trust is working on improving the EAC rice trade by promoting the EAC SPS protocol, as well as establishing rice traceability, certification, and trade mechanisms (EAC, 2019) (see Box 6). They are also financially supporting rice farmers via a USD 3.1 million-dollar grant over three years (EAC, 2019b). Rikolto implemented the UKaid-funded FoodTrade project to increase the regional rice trade and farmer incomes by improving management and post-harvest

crop handling and storage (Rikolto, 2019a). They have also partnered with the Tanzania Agriculture Research Institute (TARI) to establish quality management systems at the farmer organization level to improve rice quality and have advocated for the SRP to be included in Uganda's national rice strategy (Rikolto 2019b).

2.3.4 Wheat

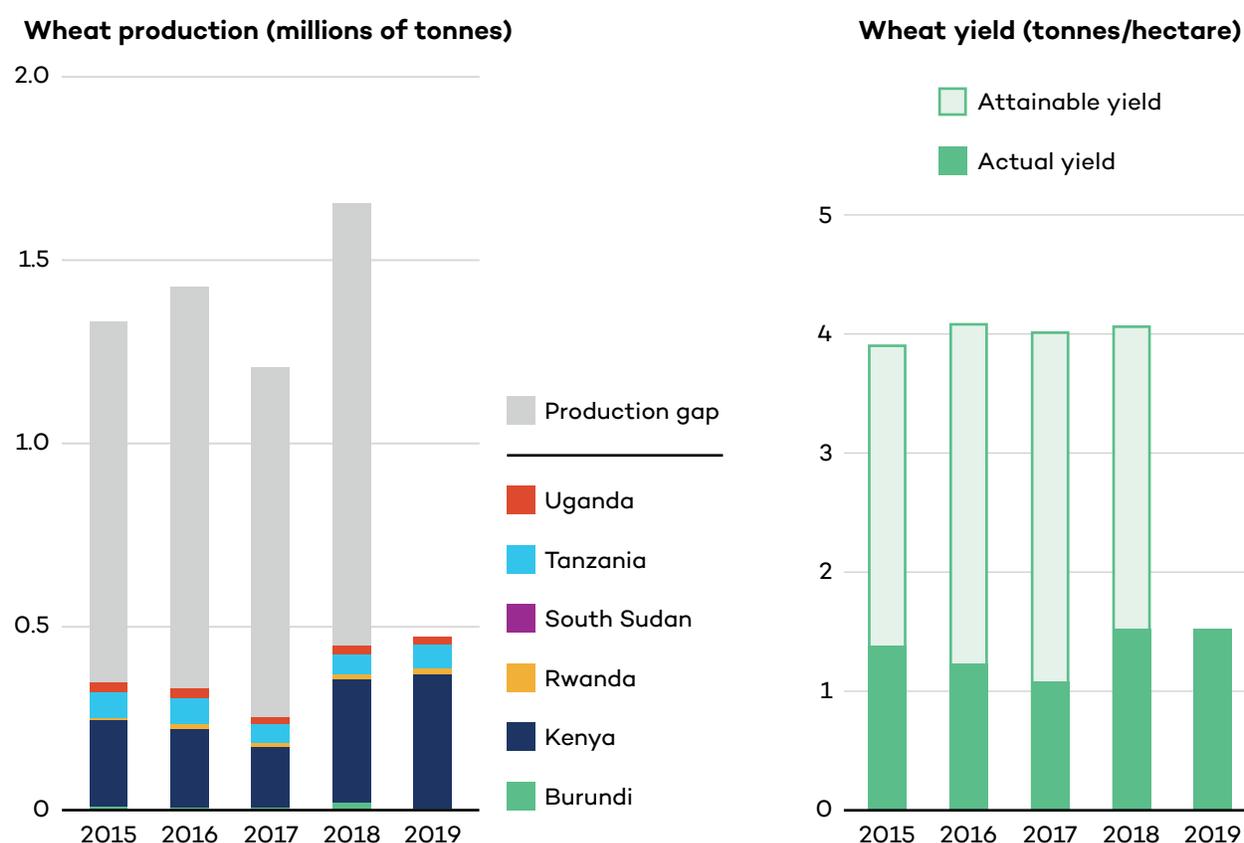
Bread wheat is the dominant wheat type produced in the EAC, and there is potential to expand this production via crop management practices and the implementation of favourable policies (Tadesse et al., 2019).¹⁷ Although wheat has not traditionally been an important staple

¹⁷ Africa produces more than 25 Mt of wheat on 10 Mha. In 2019, sub-Saharan Africa produced a total of 7.5 Mt on 2.9 Mha, accounting for 40% of African and 1.4% of global wheat production (Tadesse et al., 2019).

crop in the EAC, demand is growing, driven by a rising middle class in urban centres (Mason et al., 2015; Tadesse et al., 2019). Kenya is the largest wheat-producing country in the EAC. The total EAC area under wheat production in 2019 was less than 0.08 million ha, yielding a little more than 0.21 million tonnes (FAOSTAT, 2022). Recent yields have remained lower than estimated attainable yields, which, if realized, could lower importation needs (Mueller et al., 2012).

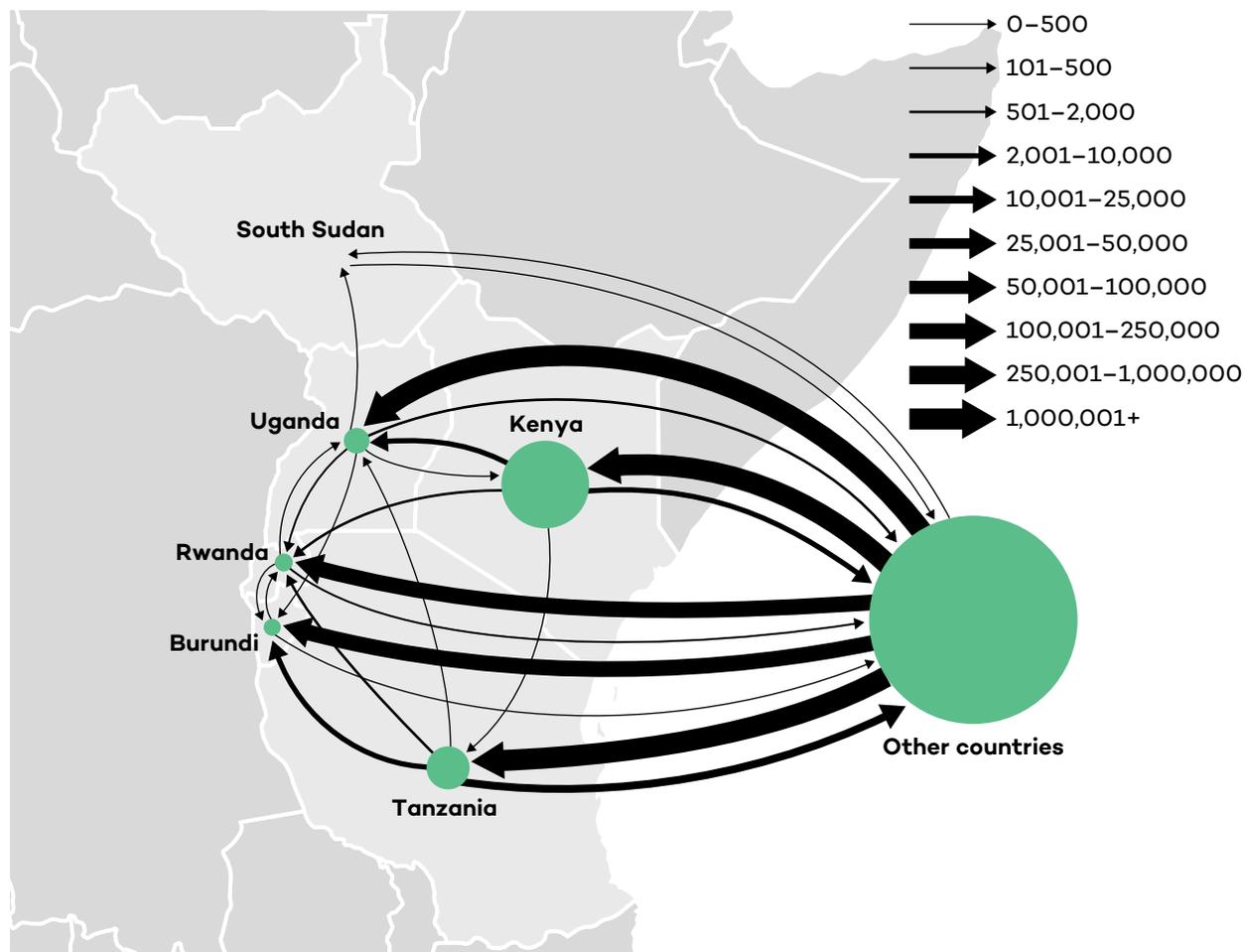
EAC wheat exports amounted to 5,289 tonnes, generating USD 1 million in 2019 (FAOSTAT, 2022). From 2015 to 2019, EAC wheat exports were destined evenly between (48%) and outside (52%) the EAC. Wheat exports have grown at a CAGR of 32% from 2015 to 2019. Kenya and Tanzania are the largest wheat importers in the EAC and source significant amounts from outside the region. Most of the EAC Partner States import wheat to meet their domestic needs (see Figure 9). Based on reported wheat

Figure 8. EAC wheat production



Note: Production gaps were estimated based on attainable yield estimates; “Attainable yields are estimates of feasible crop yields calculated from high-yielding areas of similar climate. They are more conservative than biophysical ‘potential yields’, but should be achievable using current technologies and management (e.g. fertilizers and irrigation). Attainable yields are based on assessments for the year 2000. Attainable yield pre-2000 may be lower; and post-2000 may be higher than these values” (Mueller et al., 2012, p. 254). Data source: FAOSTAT, 2022; Our World in Data, n.d.

Figure 9. EAC wheat averaged trade volumes in tonnes, 2015–2019



Note: Country nodes are sized based on relative production levels, and the arrows are sized based on exports in tonnes.

Data source: FAOSTAT, 2022.

imports averaged between 2015 and 2019, Qatar is the largest importer of EAC wheat outside of EAC Partner States (12,058 Mt), followed by Seychelles (434 Mt), the Democratic Republic of the Congo (251 Mt), Malawi (31 Mt), and United Arab Emirates (11 Mt).

Although wheat productivity has increased in the EAC, it remains relatively low due to poor soils and a lack of access to agricultural inputs, which include improved

seeds, fertilizers, pesticides, and water for irrigation (Lopez, n.d.; Tadesse et al., 2019; Thomas, 2020). The sector is dominated by subsistence farmers with limited access to these agricultural inputs and proper farm equipment. A lack of proper transportation infrastructure also limits timely access to farming essentials (Tadesse et al., 2019). Most of the wheat grown in the EAC is rain-fed and is susceptible to weather patterns, which can lower productivity and increase

dependence on importation. Climate change is expected to result in rising temperatures, droughts, and floods, as well as pests and diseases such as yellow rust and septoria, which will impact wheat production in the EAC (Shew et al., 2020; Tadesse et al., 2019). Rising temperatures can limit wheat growth, causing yield and quality losses (Adhikari et al., 2015; Tadesse et al., 2019).¹⁸ For rain-dependent areas like Kenya and Tanzania, insufficient and excess water affects soil fertility, acidity, and erosion. Excess rainfall received in South Sudan, Kenya, and Northern Tanzania during October 2019 damaged wheat in its early vegetative stages (European Union, 2019). Recent wheat stem rust epidemics in East Africa indicate that it is a re-emerging disease.¹⁹

Recommendations to improve the sustainability of the EAC wheat sector include adopting new technologies, establishing

robust seed systems, providing agricultural input subsidies, and strengthening public–private partnerships for adopting wheat cultivation technologies (Tadesse et al., 2019). Access to better wheat varieties is particularly important to improve the EAC wheat sector. Although national seed certification systems have been developed for the EAC (see Box 4), inspectors are overwhelmed and without adequate training and tools to conduct timely compliance checks (CIMMYT, 2019). Licensing, labelling, and branding protocols and regulations are not adequately implemented, and much of the work still needs to be digitized, which slows the process (CIMMYT, 2019). Digital solutions can offer faster and more accurate seed quality checks for seed producers and regulators, enabling quality in seed production and expediting licensing, certification, and trade processes with traceable records (CIMMYT, 2019). For instance, SeedAssure, a cloud-based platform

Box 7. The importance of seed for agricultural competitiveness in the EAC

In the EAC, good seed is recognized as a critical input for agriculture sectors' competitiveness. When farmers do not have access to improved seed varieties, productivity is threatened. The EAC recognizes the need for a harmonized seed legislative framework, premised on the need to promote intraregional trade as well as access to quality seeds by farmers.

The EAC Seed Harmonization Initiative works toward enhancing the delivery of improved seeds to farmers in the region.

Source: EAC, 2020d.

¹⁸ High temperatures can reduce the duration of developmental wheat stages, resulting in lower biomass, early leaf senescence, and adverse physiological and biochemical changes (Tadesse et al., 2019).

¹⁹ The cultivated wheat gene pool has a narrow genetic base for resistance to virulent races, such as in the Ug99 race group (Olivera et al., 2018).

Table 3. Total land dedicated to organic agriculture in the EAC

Country	Organic area (farmland) [ha]	Organic area share of total farmland [%]
Burundi	83	0
Kenya	154,488	0
Rwanda	1,264	0
Uganda	183,598	1
Tanzania	278,467	0

Data source: Willer et al., 2021

enabling digital seed inspections, is being rolled out across Eastern Africa with support across the seed value chain. Data necessary for quality seed production, pest and disease surveillance, and the required checks to apply for commercial licences can be shared in real time, linking seed companies, inspectors, and local authorities.

In addition to cultivating better wheat varieties, adopting more sustainable wheat farming practices is particularly important in the EAC as most of the wheat grown in Partner States is rain-fed, where effective soil and water conservation measures are important. Organic is the main VSS operating in the wheat sector in the EAC. However, Kenya is the only EAC Partner State to produce Organic-certified wheat, which was grown on 272 ha in 2018 (Willer et al., 2021). Expanding organic wheat production offers great potential to adopt more sustainable wheat farming practices in the

EAC as regional (EAOPS), national (KOAN, TOAM, and NOGAMU), and local (PGS) organic movements have been established. Expanding organic wheat production in Kenya is particularly interesting due to existing organic wheat production, increasing domestic demands for wheat and the presence of international organic certifiers.²⁰ Uganda and Tanzania also offer great potential as they both have large agricultural areas supporting organic agriculture (see Table 3).

Other notable organizations working on improving the EAC wheat sector include the CIMMYT, Climate and Development Knowledge Network, and East African Grain Council (EAGC). The CIMMYT is working on developing climate-resilient and high-yielding, pest- and disease-resistant wheat varieties (International Maize and Wheat Improvement Centre, n.d.-d). Kenya works with the CIMMYT and hosts the world's biggest screening facilities for wheat rust

²⁰ A number of international organic certifiers operate in Kenya, such as the Soil Association, Ecocert International, the Institute for Market-ecology, the United States Department of Agriculture, the National Organic Programme, and Bio Suisse (Keya & Rubaihayo, 2013).

diseases.²¹ They are also developing gender-intentional wheat varieties with gender-intentional product profiles, which are being distributed via seed delivery pathways that meet female farmer needs (CIMMYT, 2020a, 2020b). The Climate and Development Knowledge Network and the EAGC are working on increasing wheat farming climate resilience by improving weather information and knowledge exchange, strengthening incentives for establishing farmer cooperatives, improving access to finance and index-based crop insurance, mapping organizations providing climate-smart services, and tracking national grain surplus and deficits to improve trade and reduce inflated prices (ReliefWeb, 2019). The EAGC also supports East African grain trade by facilitating the use of Generic National System and an e-phyto system to receive trade phytosanitary certificates and a trade platform connecting farmers directly with grain buyers (EAC, 2015; EAGC, 2016, 2019).

2.4 Market Insights

The bean, maize, rice, and wheat sectors in the EAC are characterized by an untapped potential for increasing productivity to meet local, regional, and international market demands. Except for beans, EAC Partner States as a whole depend on importing these staple crops to meet their overall domestic demands. Despite being the agricultural commodities most traded between EAC Partner States, they experience trade deficits in maize, rice, and wheat with countries

outside of the EAC, based on averaged 2015–2019 export and import volumes. Yields across the staple crops examined could increase threefold based on attainable yield estimates.²² Except for wheat, realizing their full productivity potential would more than offset current import volumes and could enable EAC countries to increase their exports. Furthermore, these staple crops are crucial for maintaining food and nutritional security in the EAC, which is fundamental for alleviating poverty, staving off political unrest, and sustainably growing developing economies (Lokuruka, 2020). Their demand is projected to increase due to the EAC's growing population and rising middle class.

To increase the production of these staple crops, EAC farmers will need to have access to better seeds as well as agricultural inputs, which can be facilitated by improved supply networks and transportation infrastructure. Cultivation practices, post-harvest, storage, and distribution systems will also need to be improved to fully realize the benefits of improved yields. Nevertheless, increasing the production of these staple crops will need to be undertaken sustainably so as not to undermine the long-term viability of the agricultural sector, which is a key economic development engine for the EAC countries.

The need to transition the cultivation of these EAC staple crops to more sustainable forms of production is further strengthened by climate change, which threatens to affect the suitability of growing areas

²¹ Up to 40,000 accessions are tested each year for wheat rust diseases.

²² “Attainable yields are estimates of feasible crop yields calculated from high-yielding areas of similar climate. They are more conservative than biophysical ‘potential yields’, but should be achievable using current technologies and management (e.g. fertilizers and irrigation). Attainable yields are based on assessments for the year 2000. Attainable yield pre-2000 may be lower; and post-2000 may be higher than these values” (Mueller et al., 2012b, p. 254).



Bean crops in the Lusanga village, Mvomero district, Tanzania

by increasing temperatures, droughts, flooding, and pests and diseases. Similar to the COVID-19 human health pandemic, climate change is projected to disrupt global supply chains, which can limit timely access to agricultural inputs as well as delay the movement of agricultural products to market (Intergovernmental Panel on Climate Change, 2021; Stephens et al., 2020). It is clear that EAC farmers will need to adopt more sustainable and resilient farming practices to increase the production and productivity of beans, maize, rice, and wheat and maintain their long-term viability. There

is also a need for measures to enhance market access and trade, like structuring value chains, establishing direct links with buyers, and addressing the NTBs of trade (e.g., ad hoc import bans).

Growing the EAC bean, maize, rice, and wheat sectors sustainably will require significant resources from public and private entities. A number of organizations are already actively working toward realizing this potential in a number of ways, including developing and distributing higher-yielding varieties with better characteristics, such as

climate resilience, pest and disease resistance, and nutritional improvements; assisting farmers in enhancing their cultivation practices by adopting better soil and water conservation practices; and enabling trade by linking farmers with prospective buyers (see Appendix B). For instance, the PABRA, CIMMYT, IRRI, and EAC government agencies are continuously working on developing and distributing improved bean, maize, rice, and wheat varieties to enhance yields and trade potential. These agencies and others are also providing farmers with training and information to access markets and improve their profitability. For instance, Rikolto and the Kilimo Trust are linking bean farmers with processing companies. Digital trading platforms are also being developed to assist traders and processors source products.

Leveraging VSSs also offers an important opportunity to sustainably grow production as well as intraregional and international trade in these sectors. Thus far, VSSs have had a limited presence in the EAC bean, maize, rice, and wheat sectors. The EAOPS is being implemented in the beans, maize, and wheat sectors, while GLOBALG.A.P and the SRP standards are being implemented in the bean and rice sectors, respectively. Their limited presence may be due to VSS compliance costs, which can be out of reach for many smallholder farmers, as well as a lack of clear financial incentives in the form of accessible lucrative markets. For these reasons, EAC farmers who use organic farming practices largely sell non-certified organic products informally. To address this situation, PGSs have been set up to provide assurance systems and establish a regional organic mark. Although PGSs are relatively new in the EAC, they offer promise and are gaining

momentum, particularly among smallholder maize farmers.

As will be shown and discussed in detail in Section 3, VSSs can assist farmers in adopting better and more climate-resilient cultivation and business practices, improve productivity, access new markets, and overcome trade barriers. For instance, the SRP is assisting EAC rice farmers in improving their production processes, accessing commercial cultivars, and building assurance programs. SRP members such as Rikolto are also providing training on agricultural best practices. The GLOBALG.A.P. standard in the EAC bean sector requires phytosanitary measures and quality management systems that can reduce trade limitations. Implementing VSSs in the EAC bean, maize, rice, and wheat sectors has the potential to improve farming productivity, profitability, and long-term viability.

The EAC beans, maize, rice, and wheat sectors are vital to human well-being in the EAC countries as they are essential to maintaining food and nutritional security and providing livelihoods for millions of people, which include smallholder farmers with limited resources. By overcoming productivity and trade challenges in these sectors, the EAC has the potential to become more self-sufficient, food secure, and a net exporter of these agricultural commodities.

3.0 The Potential for VSSs to Support EAC Agricultural Policy Objectives



Processing maize grains into flour at the Farmer Training Centre in Vianzi villiage, Tanzania

3.1 EAC Agricultural Policy Objectives

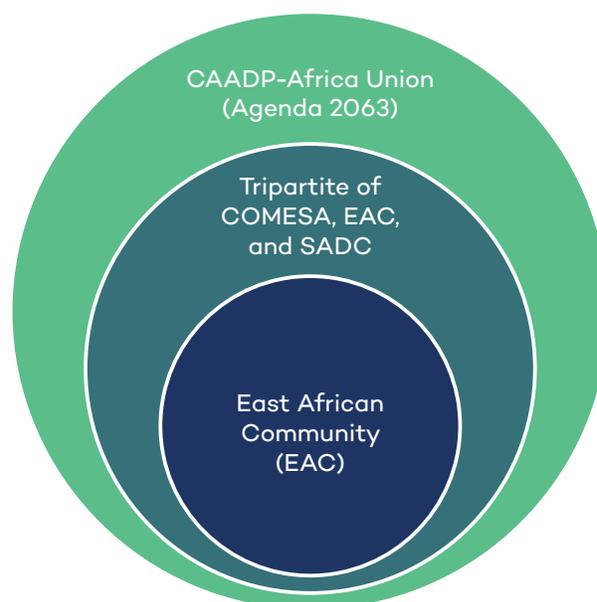
3.1.1 Introduction

The EAC was established by the EAC Treaty, which came into force in 1999 when it was signed by the three founding partner states—Kenya, Tanzania, and Uganda. The Republic of Rwanda and the Republic of Burundi acceded to the Treaty in 2007, and South Sudan joined in 2016. With the aim of regional integration of their economies and societies, the EAC has established a Customs Union (2005) and a Common Market (2010) and is in the process of converting their currencies into a single currency under a Monetary Union. The ultimate objective is to establish a complete political federation.

In terms of EAC policy implementation at the level of Partner States, the approach can vary. The EAC Treaty is legally binding but had to be incorporated into national legal systems through a process of ratification or domestication. Other EAC laws (and policies) that have since followed, however, are enacted by the EAC Assembly and do not necessarily require ratification at the national level. This means that EAC laws (and policies) take automatic effect once they have been signed by the Heads of State in the Partner States, and they take precedence over any similar national laws (Treaty art. 8 (2)(b)) (Ugirashebuja et al., 2017). Nonetheless, implementation of EAC law has been slow, and one of the major and ongoing challenges of this integration project has been making EAC law binding and enforceable within national legal systems (Ugirashebuja et al., 2017).

Agriculture is one of the priorities in the EAC integration process, as the sector provides a living for 80% of East Africans (WTO, 2019). Accordingly, there are many laws, protocols, policies, and strategies dealing with this sector of the economy. The EAC Treaty (ch. 18, art. 105–110) sets out the overall objectives of the agriculture sector as the “achievement of food security and rational agricultural production with a view of promoting complementarity and specialization in the sustainability of national agricultural programs” (EAC, 1999). Cooperation in agriculture and rural development is further underscored in the Common Market Protocol (art. 45). Other important legislation referencing agriculture as critical for sustainable economic growth and development in the region includes the EAC Agricultural and Rural Development Policy (2006) and its strategy (2005–2030), the EAC Food Security Action Plan (2019–2023), EAC’s Vision 2050, and the Climate Change Policy (2011), among others.

Figure 10. The EAC within other African trade blocs



The agricultural sectors in EAC Partner States are also embedded in—and influenced by—other policies, initiatives, and trade agreements, which are gaining momentum and confirming the importance of regional market integration on the African continent. EAC Partner States are also parties to larger trading blocs—such as COMESA, the Southern Africa Development Community, and the continent-wide African Union—which together are working toward a Tripartite Free Trade Area. Notably, the African Union seeks market integration across the whole of Africa (Agenda 2063) and has a specific policy framework for agriculture: the Comprehensive Africa Agriculture Development Programme. Through this program, 44 African countries, including the members of the EAC, commit to spending 10% of their national budgets on agriculture, working toward 6% growth in the sector. Most recently, in January 2021, the Africa Continental Free Trade Agreement became active, through which countries have committed to liberalizing trade by eliminating tariffs on 90% of their goods. The agreement is positioned to increase intra-African trade in agricultural products by 49% and by 62% for manufactured goods (World Bank, 2020).

In this report, we keep the scale of our analysis to the EAC and present some of its main policy objectives related to agriculture. The purpose of this exercise is to understand the policy landscape in which VSSs are operating within the EAC and to be able to identify ways in which VSSs can support regional policy objectives. We looked for policies of strategic importance to further these goals and, where possible, policies that are relevant to the most-traded staple crops in the EAC countries, analyzed in the market performance section—maize,

Box 8. General information on selected EAC policies

Common Market Protocol (CMP) (EAC, 2010)

Following the establishment of the Customs Union, which emphasizes the liberalization of goods through the duty-free and quota-free movement of tradable goods within the EAC, and the development of an external tariff, the CMP's aim is to accelerate economic growth and development in the region through the elimination of barriers to regional trade and to promote the free movement of citizens (EAC, 2010). In trade, the protocol refers to the elimination of tariff, non-tariff, and technical barriers to trade and the harmonization and mutual recognition of standards, as well as the implementation of a common trade policy.

Agriculture is a key sector under the CMP. It refers to sustainable development, with actions from Partner States toward the establishment of effective agricultural systems, agro-processing and value addition, control of pests and diseases, stabilization of markets in the region, and other measures related to the development of an effective regime of SPS measures, standards, and technical regulations.

Keywords: Trade, harmonization, market, and sustainable development

EAC Climate Change Policy (CCP) (EAC, 2011b)

The overall objective of the EAC CCP is to guide Partner States and other stakeholders in the preparation and implementation of collective measures to address climate change in the region while assuring sustainable social and economic development. Since most of the economic activities in the EAC region are dependent on climate-sensitive sectors, cooperation in addressing climate change is of paramount importance to the region's sustainable development. Devising strategic measures to enhance climate change adaptation and mitigation capacity to reduce the vulnerability of key sectors, such as agriculture, forestry, marine ecosystems, and others, while exploring available opportunities for economic development, is critical for the EAC region.

The EAC CCP (2011) and its related strategy and master plan (2011–2031) are founded on three key pillars: adaptation, mitigation, and climate change research (monitoring, detection, attribution, and prediction). There is also an important emphasis on capacity-building activities. Partner States are charged with implementing the policy through National Adaptation Programmes of Action or National Adaptation Plans and Nationally Appropriate Mitigation Actions.

Keywords: Climate change, adaptation, mitigation economic growth, social development and environmental sustainability, irrigation, sustainable production, disaster risk management, conservation

Agriculture and Rural Development Policy (ARDP) (EAC, 2006)

The EAC-ARDP was developed as a fundamental step in implementing one of the key objectives of the EAC Treaty, which is to ensure sustainable agricultural development and food security in the region. The overall objectives of the ARDP are to achieve food security, encourage rational agricultural production, improve standards of living in the region, increase foreign exchange earnings, support industrialization, improve agricultural productivity, and support the sustainable use and management of natural resources in order to conserve the environment (EAC, 2006).

The related strategic plan (2005–2030) provides a roadmap for the Partner States and other actors operating in the region (private sector, rural communities, non-governmental organizations, development partners, etc.) in defining multi-sectoral interventions that will lead to the improvement of the rural economy.

Keywords: Harmonization, standards, rationalization, improvement, commercialization of agricultural production and rural development, rural life, sustainability, market development

beans, rice, and wheat. Consultation with stakeholders in the EAC helped us to narrow down the list (for a complete list of the policies overviewed for selection, please see Appendix C). Finally, while food security is a major priority in the EAC, we chose not to focus on this theme directly, which has been addressed extensively in other publications, but through the angle of agricultural productivity, which is one crucial component to improving both food access and food availability in the region (Mozumdar, 2012; Pawlak & Kołodziejczak, 2020).

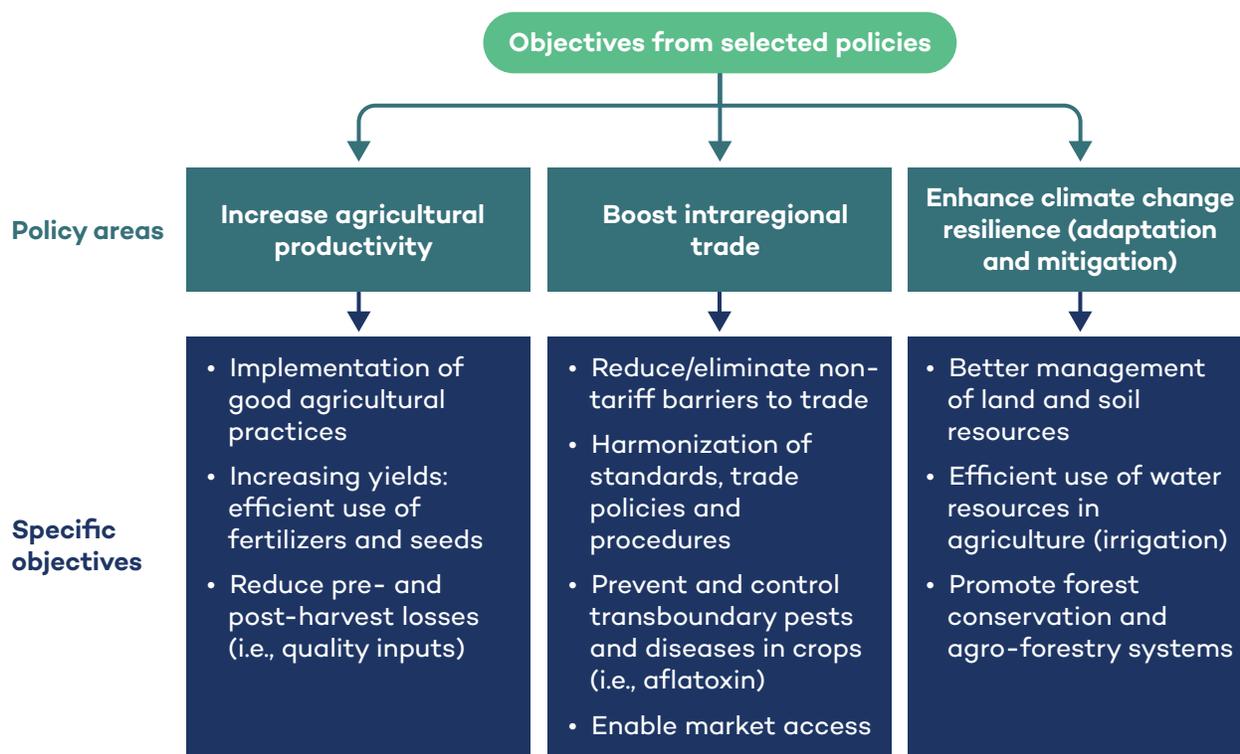
The exercise resulted in the selection of three key policies: the East African Community Agriculture and Rural Development Policy (ARDP) (2006), the Common Market Protocol (CMP) (2010), and the East African Community Climate Change Policy (CCP)

(2011), and their related strategies. Box 8 provides a general introduction to each of the three selected policies.

3.1.2 Summary of Main Policy Objectives

The following section presents an analysis of the main agricultural policy objectives in the EAC, drawing from the three policy documents identified in the previous section. An inductive process was used to study each of the three policies—going from an understanding of the detail and specificity of each policy to obtaining a level of generalization that would facilitate subsequent benchmarking against select VSSs (Section 2.3). An iterative process was used to confirm the selection of policies, with local stakeholders providing feedback that led to a refinement of

Figure 11. Agricultural policy areas and objectives, EAC



the selection. As summarized in Figure 11, the main policy areas identified are: 1) increasing agricultural productivity, 2) boosting intraregional trade, and 3) enhancing climate change resilience (adaptation and mitigation), which align with the three main challenges in the agriculture sector in the EAC that we are exploring in this report. Each of these larger policy areas has 3–4 corresponding specific policy objectives. Each policy area is presented in detail below, and the supporting excerpts from the original policies can be found in Appendix F of the report. While this analysis derives from EAC policy only, the selection of issues is relevant beyond this scope and reflects many of the prevailing challenges in agriculture on the African continent.

3.1.3 Policy Excerpts From Priority Areas

3.1.3.1 Regional Policy on Agricultural Productivity

As described in the Introduction to this report, the low agricultural productivity of staple crops remains a challenge in the EAC countries compared to what has been achieved in other parts of the world (Karugia et al., 2013). Numerous and overlapping causes have been identified to explain the prevalence and persistence of this challenge, such as erratic climate conditions, high dependence on rain-fed agriculture, and the low quantity and quality of inputs such as agrochemicals, seeds, technology, and fertilizer (World Bank & WTO, 2018). Section 2 showed the trade consequences of this low productivity in the form of “productivity gaps” for each of the four crops under analysis. This highlights the potential for regional production to meet more and more of the regional demand and reduce the significant volumes of wheat and rice imported into the EAC each year (Kilimo Trust, 2014).

Agricultural productivity features prominently in the three selected EAC policies (see Appendix F for complete policy excerpts) in its own right but also as a means to support other goals (e.g., economic growth, food security). The CMP (EAC, 2010) states that one of the overarching objectives of promoting agriculture in the Common Market is to increase agricultural production and productivity (art. 45.2) and outlines steps for the Partner States to take (art. 45.3), such as producing and distributing higher-quality seeds, collaborating on pest control, and establishing early warning systems (EAC, 2010). In the ARDP, agricultural productivity is one of the ways forward for advancing food security (art. 4.1) and is also given importance with respect to the challenge of decreasing land availability for agriculture, given population growth (art. 4.2). The link between productivity and irrigation is made (art. 4.8.3), and special attention is also given to production in disaster-prone areas (art. 4.9.2) (EAC, 2006). In the CCP, the overarching objective for agriculture is to “Develop adaptation framework for agriculture to improve agricultural productivity and enhance food security” (EAC, 2011b). Productivity is also addressed in the context of improving and/or maintaining soil health (art. 3.1.3.3 (v)) and as a necessary objective for, in turn, preventing deforestation in the region (art. 3.1.3.3 (vi)) (EAC 2011b).

From these broad policy provisions related to agricultural productivity, the following specific policy objectives were distilled for our analysis:

1. Implementation of good agricultural practices, which relate to general practices and principles.
2. Increasing yields through the use of improved inputs such as fertilizers and seeds.

3. The reduction of pre- and post-harvest losses.

3.1.3.2 Regional Policy on Intra-regional Trade in Agriculture

Market integration is a key pillar of the EAC, as described in the introduction to this section. It is manifested through the establishment of a Customs Union, Common Market, and, for the moment, an aspirational single currency. Trade in agricultural commodities between Partner States should, in theory, benefit from the removal of tariffs and NTBs, the harmonization of trade policy, and the mutual recognition of standards. While progress has been made, significant challenges remain, including:

- Ad hoc and unpredictable import bans on staple crops
- Low levels of commercialization and specialization
- Structural biases against small traders and vulnerable groups
- Bureaucracy and delays at customs points and inadequate market information
- The informality of much agricultural trade, which increases the cost of doing business and makes it harder to implement legitimate measures.

As it stands, intra-regional trade is underdeveloped; overall, the share of intra-regional trade in regional food product markets is approximately 10% for most-traded food products (FAO, 2019). In spite of the desire to integrate markets on paper, in practice, there is still protectionism between EAC countries—one clear example is NTBs to trade, such as delays or the rejection of the movement of goods at borders or checkpoints. This issue and the other trade challenges cited

have the obvious effect of hampering trade within the region, but they, in turn, also slow the realization of *other* policy objectives (i.e., employment, income, and food security). For example, if Kenya has a shortage at certain times of the year in grain or maize, the free movement of produce would mean that goods flow from areas of surplus to deficiency.

The EAC policies related to market access and integration in agriculture and excerpts of some of these policy objectives are provided in Appendix F. Notably, trade integration is the core material of the CMP, which aims to enable the free movement of goods, people, labour, capital, and services across the region, as can be found in its introductory principles (art. 4 and 5) as well as in a specific article on the agricultural sector (art. 45). The EAC recognizes the need for regional standards, harmonizing food safety measures and implementation procedures across the region, and increasing the share of intra-regional trade in regional food markets. The EAC CMP and the EAC Protocol on Sanitary and Phytosanitary (SPS) Measures support the harmonization of standards in the region, including for agriculture and food.

The ARDP was one of the earlier EAC policies developed (in 2006). As such, it reiterates in many places the need to harmonize policies and legislation on specific issues, for instance, food security (art. 4.1.3 (i)), early warning systems (art. 4.2.3 (ii)), forestry policies (art. 4.5.3 (i)), pest control (art. 4.7.3), and land use and tenure policies (art. 4.14.3 (i)). Moreover, the policy has a dedicated objective (art. 4.10.2) to “improve access of agricultural products to domestic and international markets,” and another objective (art. 4.15.2) dedicated to “Creating

Box 9. A successful experience of the mutual recognition of organic certification for intraregional trade: The case of Chile and Brazil

In 2019, the governments of Chile and Brazil signed and implemented a Memorandum of Understanding of Organic Products, which acts as a mutual recognition system for raw materials and organic products to facilitate the growing bilateral trade in this sector. The agreement is the first one in the world that recognizes, without restrictions, both modalities of organic certification: third-party certifications and PGSs. In this way, fresh and processed vegetable products authorized under the scope of this agreement may be exported and commercialized in both countries using their corresponding labels.

According to an interview with the director of the Agriculture and Livestock Service of Chile, the agreement was possible thanks to the consistent work of local organic associations, a long commercial relationship with Brazil, and strong collaboration and communication among agricultural services and ministries, coupled with the fact that organic systems and SPS mechanisms worked in similar ways in both countries.

Source: Interview data; for more information, visit the Agriculture and Livestock Service website <http://www.sag.cl/> (in Spanish).

an enabling legal and regulatory framework for agricultural and rural development.”

The CCP touches on market integration and trade in Chapter 3 on Adaptation, calling Partner States to use integrated pest and disease management to harmonize their agricultural policies and standards and to improve distribution and management systems to promote affordability and access. It also refers to market integration in the context of Technology Development and Transfer in Chapter 4 (ch. 4.2.2) and the need to remove technical trade barriers, which include standards and eco-labels (ch. 4.2.2(ii)). While not listed below, the EAC Food Security Action Plan also underlines putting in place a structured trading system for food commodities in the region to improve access to food and to move food from areas of surplus to areas of deficit within the region (EAC Food Security Action Plan, p. 21).

A structured trading system would help to establish a regional commodity exchange, increase contract farming and outgrower schemes, and encourage the adoption of agricultural traceability systems.

From these broad policy provisions related to market integration and agriculture, the following specific policy objectives were distilled for our analysis:

1. Reduce/eliminate NTBs to trade.
2. Harmonize standards, trade policies, and procedures for agricultural commodities (e.g., SPS, food safety and quality, traceability).
3. Prevent and control transboundary pests and diseases in crops.
4. Increase market access for farmers.

3.1.3.3 Regional Policy on Climate Change and Agriculture

As farmers are already experiencing the negative effects of changing temperatures and weather patterns due to global warming, adapting agricultural practices to make production systems more resilient to climate change will be key to seeing long-lasting benefits in the agricultural sector. The EAC CCP (EAC, 2011b) is the main regional policy document on this critical issue. It outlines some of the main challenges for the agricultural sector in dealing with climate change, including inadequate water storage, a lack of improved high-yield/climate-friendly varieties, poor policy implementation, inadequate farm inputs (e.g., fertilizer) and extension services (e.g., climate expertise), and insufficient financial resources.

To address these issues, the CCP is divided into three main lines of action: adaptation, mitigation, and research. Adaptation (ch. 3) is the explicit priority for the region, with sectoral-specific objectives for agriculture, land use and forests, water resources (3.1.3.3(i)) and disaster risk management (3.1.3.3 (xi)) relevant to agriculture. In terms of mitigation (ch. 3), the EAC countries are not major emitters of GHGs, but there are nonetheless sector-specific objectives for agriculture, forests, and waste management. The Mitigation section also emphasizes common but differentiated responsibilities and encourages EAC Partner States to take advantage of opportunities for climate-friendly development by proposing projects to be certified under the Clean Development Mechanism or through Nationally Appropriate Mitigation Actions. The Research and Observations section of the policy deals with the capacity of the

National Hydrological and Meteorological Services of the Partner States of the EAC to recognize the role that climate change scenarios play in understanding the vulnerability of communities and developing adaptation strategies that would minimize the associated impacts.

In the other two policies studied, climate change is not referred to explicitly. The CMP references the environment in art. 40. Interestingly, they specify that Partner States are not prevented from being more stringent than the EAC in environmental regulations. Indeed, it is common in the EAC for national standards to be more rigorous than regional and international standards. Also, the ARDP, with its focus on agricultural rationalization, has policy provisions on land use and environment, forestry, the need for better irrigation and water management, and responding to natural disasters.

From these broad policy provisions related to climate change resilience and agriculture, the following policy objectives were distilled for our analysis:

1. Better management of land and soil resources, working toward resilience and sustainability.
2. The use of irrigation and the efficient use of water resources for agriculture, recognizing the vulnerability of rain-fed agriculture to climate change.
3. The use of forest conservation and agro-forestry.

3.2 Benchmarking VSSs Against EAC Policy Objectives

Section 3.2 builds directly upon Section 3.1 by benchmarking three different VSSs against the main policy areas and objectives identified above. What we mean by “benchmarking” is that the policy areas from Section 3.1 (improving agricultural productivity, boosting intraregional trade, and enhancing climate resilience), with their related objectives, become a framework with which we assess the provisions found in three different agricultural VSSs operating in the EAC region. The overview of the benchmarking can be found in Section 3.2.4 (Tables 6, 7, and 8). This benchmarking enables a systematic and thorough approach to studying each VSS in light of EAC policy objectives and informs the subsequent analysis of where there is alignment between the content of EAC policy and VSSs.

While the benchmarking results below come from a textual analysis of the written standards, the rest of the findings, perspectives, and analysis in this section are equally informed by interviews with local and expert stakeholders. The authors spoke with 15 local and external actors, including government officials, farmers’ organizations, development agencies, VSSs, and private sector actors (a complete list of organizations consulted is provided in Appendix D). In addition, perspectives come from the results of a workshop with over 30 participants that took place in June 2021 involving government officials from across the region.

3.2.1 Benchmarking VSSs Against EAC Policy Priorities

The benchmarking exercise that can be found in Tables 6, 7, and 8 was developed by examining the EAC agricultural policy priorities identified in Section 3.1. To recall, each of the three main policy areas (improving agricultural productivity, boosting intraregional trade, and climate resilience) has 3–4 more *specific* policy objectives (10 in total). For each of these 10 specific policy objectives, we identified (or sometimes developed) indicators from VSS content criteria/provisions that best correspond to the policy objectives. In terms of developing and defining the indicators, we started by selecting keywords from the policy objectives themselves. These were then cross-referenced with indicators from the ITC’s Sustainability Map²³ or from IISD’s Sustainability Standard Initiative Reviews.²⁴ In many cases, there were already indicators related to the specific policy objectives that could be used. In other cases, the authors reworded indicators from these resources to better match the policy objective or occasionally developed new indicators—the latter for cases where the policy objective is not a traditional focus of VSSs, such as the harmonization of standards. This exercise resulted in 56 indicators across the 10 policies, which are divided into three tables, one per policy area.

The most recent operational versions of each of the selected standards at the time of writing and researching for the report were used for the analysis:

²³ Find the ITC’s Sustainability Map here: <https://sustainabilitymap.org/home>

²⁴ See the reviews under Commodities Coverage at <https://www.iisd.org/ssi/>

- Sustainable Rice Platform Standard for Sustainable Rice Cultivation (Version 2.1) of January 2020: <https://www.sustainablerice.org/wp-content/uploads/2021/10/103-SRP-Standard-Version-2.1.pdf>
- GLOBALG.A.P IFA V.5.2²⁵: https://www.globalgap.org/uk_en/for-producers/globalg.a.p/integrated-farm-assurance-ifa/versions-overview/version-FAQ/
- East African Organic Production Standard (EAOPS) EAS 456:2007: https://kilimohai.org/fileadmin/02_documents/Standards/East_African_Organic_products_standard.pdf

The content criteria of these three VSSs were then assessed against the 56 indicators. As can be seen in Tables 6, 7, and 8, indicators were scored as either “Addressed” or “Not Addressed” by the VSSs. Notes on scoring and differences in the VSSs are discussed below. For simplicity, assessments of the localg.a.p. levels were not included in the body of the report, but a full evaluation including the three localg.a.p. levels—Entry Level, Foundation Level, and Intermediate Level—can be found in Appendix E.

3.2.2 Notes on Similarities and Differences in VSS Design

It is important to note that the three selected VSSs—like VSSs in general—have differences in their design, scoring method, and sometimes in their goals or Theory of Change. In this section, we briefly describe some of the

similarities and differences in the select VSSs to provide important caveats before going on to compare and analyze their potential vis-à-vis EAC policy objectives.

The three VSSs selected are similar in that each can be used by producers initially as a self-assessment tool for understanding and working toward best practices in agriculture. Producers wishing to pursue third-party certification must then contact the designated and/or authorized certification bodies to undertake an on-site inspection/audit. Once the producer complies with the standard requirements, a certificate is issued for the relevant scope and version of the standard. For all three VSSs, group certification (i.e., through cooperatives) is also a possibility.

GLOBALG.A.P.’s auditing and verification processes are well-established, with a global network of over 160 independent certification bodies. The SRP’s auditing and verification processes have been supported by GLOBALG.A.P. since 2020, with GLOBALG.A.P. managing the approval process of SRP verification bodies that are responsible for the inspection of rice producers according to the SRP standard. For the EAOPS, it is recommended, though not mandatory, that inspection and certification be carried out in accordance with international norms, such as ISO 17065 or the IFOAM Accreditation Criteria. However, the EAOPS can be used in a variety of different ways, such as for self-declaration of conformity or for assessment through

²⁵ The GlobalG.A.P. IFA Standard has been recently updated. It was published on April 2022 and will take effect on May 1, 2023. The updated standard includes requirements that protect workers' health, safety, and welfare; protect and enhance biodiversity and soil fertility; prevent natural ecosystems and habitats with conservation value that had not been converted as of January 1, 2014, from being converted into agricultural land. It also requires the restoration of ecosystems and habitats with conservation value that has been converted to agricultural land before that date. More details are available at this link: https://www.globalgap.org/uk_en/

PGSs—neither of which require third-party certification but can nonetheless provide a means to be recognized in local markets.

Each of the VSSs covers a wide range of issues related to sustainable agricultural production—only a selection of which are assessed in the benchmarking (Tables 6, 7, and 8). The nature of the exercise is to assess these VSSs in light of the specific policy objectives identified in Section 3.1. Therefore, the evaluation is skewed toward the policy priorities of the EAC and does not capture (nor aim to capture) the full content covered by these standards.

In terms of scoring, the analysis in Tables 6, 7, and 8 assesses the content criteria of the select VSSs based on whether an issue is “Addressed” or “Not Addressed.” This provides a way to compare the three standards (and also the three localg.a.p. standards in Appendix E) in a simple, consistent, and fair way, but it does mask some important differences in how the standards evaluate farm practices. The EAOPS is straightforward, in that criteria are simply “required” for conformity with the standard; there is no time-bound plan associated with the criteria as it is designed to fit a number of different contexts (certification, self-assessment, declarations of conformity, and other forms of verification). The SRP, on the other hand, is based on a scoring system with different levels of compliance to provide an improvement process for farmers. GLOBALG.A.P and localg.a.p. scoring systems are structured as “Major must,” “Minor must,” or “Recommendation.” The number of requirements covered by localg.a.p. levels—Entry, Foundation, and Intermediate—are lower than GLOBALG.A.P’s IFA standard,

and as the levels progress, so do the number of requirements. For the full analysis of the localg.a.p. standards against EAC priorities, see Appendix E.

3.2.3 Analysis: The potential of the VSSs to support EAC policy

Each of the VSSs analyzed is operational in the EAC region, either as a certification program (EAOPS, GLOBALG.A.P) or as a pilot project (SRP, localg.a.p.). EAOPS is a regional standard in the sense of being specifically designed for the East African context, while the others (SRP and GLOBALG.A.P) are international standards that are being implemented locally. It is important to note that the benchmarking assessment in Tables 6, 7, and 8 is not an assessment of performance but is based on an analysis of the requirements covered in the written standard. A VSS on paper can be quite different from its implementation on the ground; this analysis just captures the former.

As can be seen in Tables 6, 7, and 8, each of the VSSs included in the analysis can contribute to advancing various EAC policy areas, as shown by a positive score (“Addressed”) against the indicators for each policy area. On the other hand, some policy priority areas are not addressed by VSS activity, as shown by a negative score (“Not Addressed”) against the indicators for each policy area. Overall, we can see that the three VSSs score similarly, showing alignment with approximately 60% of the EAC agricultural-specific policy objectives. This section proceeds with a detailed analysis of the alignment between the VSSs and EAC agricultural policy priorities.

To reiterate, the criteria that the standards are being compared to are not comprehensive—they have been developed for research purposes in alignment with EAC policy priorities. Therefore, the following discussion does not present the overall strengths and weaknesses of these VSSs in general but vis-à-vis the specific policy areas and objectives of the EAC.

3.3 Benchmarking Results

3.3.1 The “Enhancing Climate Resilience” Policy Area – Strong alignment

There is clear, positive alignment between the policy area “Enhancing climate change resilience” and the content coverage in the select VSSs. This corresponds to the specific policy objectives of 1) better management of land and soil resources, 2) efficient use of

water resources, and 3) promotion of forest conservation and agro-forestry systems.

The policy objective “Better management of land and soil resources” corresponds to indicators for soil health, such as addressing contamination, using organic fertilizer, and the safe use and management of chemicals applied to land. Each of the VSSs covers all indicators (100% coverage of the policy objective). Soil and land provide essential ecosystem services, such as nutrient cycling, habitats for organisms, water filtration, carbon storage, and the provision of food, fibre, and fuel (FAO, 2015b). When land and soil resources become degraded (e.g., through erosion, salinization, pollution), it increases exposure and sensitivity to climate impacts, reducing the climate resilience of agriculture (Gisladottir & Stocking, 2005; Webb et al., 2017).

Table 4. Benchmarking VSS content criteria against EAC policy: Climate change resilience in agriculture

VSS Content Criteria (ITC Criteria Code)	East Africa Organic Products Standard (EAOPS)	Sustainable Rice Platform (SRP)	GLOBALG.A.P. IFA Standard
Better management of land & soil resources			
Does the Standard require biodegradation of organic matter waste (composting)? (2051)	✓	✓	✓
Does the Standard address soil resources condition? (2059)	✓	✓	✓
Does the Standard address soil resources contamination? (10060)	✓	✓	✓

VSS Content Criteria (ITC Criteria Code)	East Africa Organic Products Standard (EAOPS)	Sustainable Rice Platform (SRP)	GLOBALG.A.P. IFA Standard
Does the Standard require procedures to be in place for the use of organic fertilizers (or biofertilizer)? (700347)	✓	✓	✓
Does the Standard require agro-chemical waste management? (2577)	✓	✓	✓
Efficient use of water resources in agriculture (irrigation)			
Does the Standard address water extraction/irrigation? (10086)	⊘	✓	✓
Does the Standard address water dependencies and water scarcities? (2036)	✓	✓	✓
Does the Standard address emergency response plans (e.g. strategies for floods and droughts)? (701326)	⊘	⊘	⊘
Does the Standard require a water management plan? (300663)	⊘	✓	✓
Does the Standard address water reuse, recycling and harvesting? (2032)	✓	✓	✓
Promote forest conservation and agro-forestry systems			
Does the Standard require procedures in place for reforestation? (2069)	⊘	✓	⊘
Does the Standard require procedures in place to prevent/ remediate deforestation? (2071)	⊘	✓	⊘
Does the Standard address the conversion of forests into production land? (2072)	✓	✓	⊘
Does the Standard promote agro-forestry systems?	✓	✓	⊘
Does the Standard address ecosystem restoration/ rehabilitation? (2124)	✓	✓	✓
Does the Standard address the protection of rare, threatened and endangered ecosystems? (700370)	⊘	✓	⊘
Does the Standard address protection of High Conservation Value Areas? (4090)	✓	✓	⊘

✓ Addressed/Yes

⊘ Not addressed/No

Local Stakeholder Perspective

VSSs can be a source of information for sustainable development indicators, like the SDGs

Local stakeholders and experts interviewed for this research perceived VSSs as a potential source of data, facilitating the measurement of different indicators on climate change adaptation, resilience, worker safety, and others. This is pertinent, considering that the EAC region (and African continent) is aligning projects and initiatives toward the achievement of the 2030 UN SDGs and the goals related to the African Union's Malabo Declaration on agricultural transformation.

Records kept by the VSSs on producer performance (anonymized) related to productivity, water use, nutrient use efficiency, GHG reduction, and food safety considerations are all examples of indicators that could be fed into other reporting systems. This information may even be accessible through periodic assessment reports compiled by the VSSs. Notably, the SRP has started monitoring the impact of their standard in the region by measuring selected indicators such as income, labour productivity, biodiversity, and GHG emissions reduction.

VSSs can track and mark progress on climate resilience and other development goals.

As such, better management practices that maintain or enhance the soil and land condition can be considered an “anticipatory adaptation strategy” to building productive and resilient agroecological systems (Webb et al., 2017), which can support EAC climate adaptation objectives. The carbon storage features of better-conserved soil can also contribute to the climate change mitigation measures found in EAC policy (especially CCP).

The policy objective “Efficient use of water resources” is covered by the VSSs to varying degrees. Overall, the VSSs do not promote irrigation, per se, but demand that certain measures are in place by producers for managing water resources sustainably. This corresponds to certain EAC policy objectives for promoting practices and technologies for

the sustainable use of water. As can be seen in Table 4, the SRP and GLOBALG.A.P. both address the use of irrigation efficiency techniques and technologies and the use of water management plans. The SRP has specific measures for farmers of rain-fed systems and of irrigated systems. GLOBALG.A.P. requires farmers to track the impacts that their water use might have on the local environment and outlines measures to ensure the efficiency of irrigation water. All three VSSs address the need to avoid creating or aggravating water scarcity, as well as encouraging water harvesting or reuse. The EAOPS has just one provision related to water: “5.5.4 The operator shall not deplete or excessively exploit water resources and shall seek to conserve water resources and quality. Where necessary, the operator shall collect or harvest rainwater” (EAOPS,

2007). The rational use of irrigation water is particularly critical in arid or semi-arid regions and in regions with cyclical drought.

As for the policy objective, “Promotion of forest conservation and agro-forestry systems,” the SRP stands out for its coverage of all of the indicators included in our assessment (100% coverage). The SRP specifies that farmers *must* maintain trees, refuges, and non-cropped land, and moreover that any trees harvested must be replanted. It also has a specific provision related to high biodiversity sites: “Rice farming after 2009 has not been causing conversion within a (proposed) protected area, Key Biodiversity Areas™, Ramsar Sites (wetland), primary forest, secondary forest (native), or other natural ecosystems and land types such as prairie.” The EAOPS also covers the majority of indicators, promoting agro-forestry “to the extent possible and as appropriate to the crops and conditions” and specifies that “culturally or legally protected ecosystems not be converted” (art. 5.3.3 and 5.3.2; p. 6). GLOBALG.A.P. (and localg.a.p.) focuses on issues directly related to agricultural practices (cropping) only, therefore forestry as an issue area is outside of their scope. However, GLOBALG.A.P. has a provision on conservation and on converting unproductive sites into ecological focus areas for flora and fauna.

Takeaway Message: Climate change continues to negatively affect the production of beans, maize, grain, and rice in the EAC by exposing farmers to droughts, floods, and resource degradation. There is a role for VSSs in creating incentives for farmers, cooperatives, and small and medium-sized enterprises to engage in climate-resilient practices, such as

improving the quality of soil, using water resources efficiently, and integrating agro-forestry practices.

3.3.2 Agricultural Productivity – Medium alignment

There is medium alignment between the policy area “Increasing agricultural productivity” and the content coverage in the selected VSSs. This level of alignment corresponds to the specific policy objectives of 1) implementing good agricultural practices, 2) increasing yields through the efficient use of fertilizers and seeds, and 3) reducing pre- and post-harvest losses.

Regarding the first category of indicators, “Implementing good agricultural practices,” a range of general issues is addressed here and provides an overview of some of the content of the different VSSs. Training is an important component of all three VSSs, which is a notable feature given the often-cited “capacity challenge” of improving agricultural practices in the region. The quality of agricultural inputs is also addressed by all three. Beyond that, some differences in their focus areas are also revealed.

For the policy objective “Increasing yields through the efficient use of fertilizers and seeds,” the alignment with VSS indicators is mixed or uncertain. Seed, for example, is a timely issue in the EAC with the 2018 EAC Seed and Plant Varieties Bill, which seeks to establish a common registration of seeds across the EAC, with corresponding authorities and committees and regional recognition/certification. The bill has raised concerns among some farmer associations and civil society groups, who are fearful that commercial seeds will be promoted over

Table 5. Benchmarking VSS content criteria against EAC policy – Agricultural productivity

VSS Content Criteria (ITC Criteria Code)	East Africa Organic Products Standard (EAOPS)	Sustainable Rice Platform (SRP)	GLOBALG.A.P. IFA Standard
Implementation of good agricultural practices			
Does the Standard require sustainable management and use of natural resources? (30015)	✓	✓	⊘
Does the Standard address conditions of employment? (2588)	✓	✓	⊘
Does the Standard Body provide training and knowledge opportunities for farmers?	✓	✓	✓
Does the Standard address high-quality agricultural inputs?	✓	✓	✓
Does the Standard specific climate adaptation activities? (701327)	⊘	✓	✓
Does the Standard address legal land title and use rights? (4071)	⊘	⊘	⊘
Increasing yields: efficient use of fertilizers and seeds			
Does the Standard promote training for farmers on the use of inputs (fertilizers, chemicals, management practices)? (60012)	✓	✓	✓
Does the Standard promote access and selection of inputs and varieties (traditional versus improved/engineered)? (300467)	✓	⊘	✓
Does the Standard address diversity of planting materials, seeds and crop genotypes? (2657)	✓	✓	✓
Does the Standard require sustainable use of fertilizer (e.g. amount per unit of land)? (700349)	✓	✓	✓

VSS Content Criteria (ITC Criteria Code)	East Africa Organic Products Standard (EAOPS)	Sustainable Rice Platform (SRP)	GLOBALG.A.P. IFA Standard
Reduce pre- and post-harvest losses			
Does the Standard require quality control processes for product transportation? (4065)	✓	✗	✓
Does the Standard address quality of storage facilities (warehouses, cold storage, etc.)? (700443)	✓	✓	✓
Does the Standard require monitoring, measurement, and reduction of waste? (10082)	✗	✗	✓
Does the Standard address training/knowledge transmission on pre and post harvest losses?	✗	✓	✓

✓ Addressed/Yes

✗ Not addressed/No

farmer-managed systems and the traditional practice of saving seeds for use from year to year (African Centre for Biodiversity, 2019). The VSSs studied have varying provisions on seed origin (see Box 10), but it remains to be seen if and how the 2018 bill will be implemented and to what extent VSS provisions on seeds might conflict. In any case, compliance with national laws and regulations on seed origin and use is a requirement in the VSSs studied. On the issue of genetically modified seeds, which has support from some EAC Partner States, all VSSs studied address the diversity of seed inputs and recognize the potential benefits of mixing genotypes for enhancing agricultural productivity and for controlling the pests and diseases that harm productivity.

Another example of mixed alignment between the VSSs and the policy objectives is the use of

chemical fertilizers and pesticides. Increasing chemical fertilizer production and use are promoted by EAC officials and national governments across the continent to enhance agricultural productivity (AfDB, 2018).

The VSSs, on the other hand, tend to promote the use of organic fertilizer only (EAOPS) or to put specific conditions on the use of organic and inorganic fertilizers (SRP, GLOBALG.A.P.). In some ways, these tensions and uncertainties highlight an underlying and long-standing lack of consensus on the “best way” to enhance productivity—a debate that goes beyond the scope of this report.

What is notable, however, is that VSSs provide good examples of finding a middle ground by referring to the “responsible” use of chemical inputs, which can also contribute to soil fertility and plant health.

Box 10. Select VSS provisions on seed origin

EAOPS on Seeds

Excerpt from Version 2007: https://kilimohai.org/fileadmin/O2_documents/Standards/East_African_Organic_products_standard.pdf

5.8.1 Seeds, seedlings and planting materials from organic production shall be used. If organic seeds, seedlings and planting materials are not commercially available, then conventional, chemically untreated seed, seedlings and planting material may be used. Only if these are not commercially available may chemically treated seeds, seedlings and planting materials be used. The operator shall demonstrate the apparent need for such use. All use of chemically treated seeds, seedlings and planting materials shall be documented.

SRP on Seeds

Excerpt from Version 2.1 (2020): <http://www.sustainableice.org/Resources/>

9. Pure Quality Seeds

Pure quality seeds are free of weeds seeds, pests, and diseases.

Certified seeds must comply with applicable national law/regulation or the regulation of the destination market. Seeds with quality control (not certified) must meet criteria including varietal purity, weed seed-free, germination testing, safe storage, fungal control, and others. Self-saved seeds with quality control must meet criteria including safe storage, roguing (removal of all off-types or mixtures of plants) in the field before harvest, and others. The practice of self-saving seeds should not exceed 3 crop cycles.

GLOBALG.A.P. on Seeds

Excerpt from IFA V.5.2: <https://www.globalgap.org/it/gap-news/IFA-Version-5.2-whats-new/>

CB 2. Propagation material

CB 2.1.1. When seeds or propagation material have been purchased in the past 24 months, is there evidence that guarantees they have been obtained in compliance with variety registration laws (in the case mandatory variety registration exists in the respective country?)

CB 2.2 Chemical Treatments and Dressings

CB 2.2.1 Is the purchased propagation material (seed, rootstocks, seedlings, plantlets, cuttings) accompanied by information of chemical treatments done by the supplier?

Local Stakeholder Perspective

Uncertain future for the EAOPS

The EAOPS is an example of a locally developed VSS; however, ownership of the standard and the task of keeping it up-to-date and relevant have been neglected according to some local stakeholders. One interviewee for this report confided:

“The EAC is custodian of the standard. So, it would be counter-productive for them to, for example, promote synthetic fertilizer without paying attention to the EAOPS, which requires or suggests not to overuse synthetic fertilizers. We constantly engage the EAC on the fact that they need to be cognizant of this. It is also necessary for the 2007 EAOPS standard to be updated if it is to be relevant.”

Moreover, the Kenya Bureau of Standards, which was an active organization in the creation of the EAOPS in 2007, does not officially recognize the standard now, and its operationalization is not part of its mandate. In an interview, a KEBS representative expressed that they are now supporting EcoMark Africa instead, which is a label that is being scaled up to recognize all sustainable products in Africa. EcoMark Africa was established by the ARSO and is being developed for local markets (across the continent) and international markets.

It can also contribute to ensuring products are not in excess of the maximum residue limits of pesticides or other chemical inputs, which can otherwise become an NTB to trade.

As for specific examples from the VSSs, the SRP specifies that farmers will use preventive measures in the case of weeds, insects, or diseases and will only resort to herbicides, insecticides, or fungicides if other curative measures are not available. GLOBALG.A.P. specifies, pragmatically, that the use of chemical agents may be required by importing or third countries to obtain quarantine compliance and therefore requires producers to provide information about preventing and monitoring its use. All the VSSs analyzed require record keeping of inputs, chemical or otherwise.

The VSSs are strongly aligned with the policy objective to “Reduce pre- and post-harvest losses,” specifically in terms of the aflatoxin challenge facing the EAC that leads to significant post-harvest losses in maize, rice, and bean crops. All three VSSs require an assessment of the quality of transport and storage. This is significant, as aflatoxin contamination is caused in large part by too much humidity in storage and transport containers and from poor cleaning and drying practices (Sumner & Lee, 2009). It has been shown that simple post-harvest sorting, drying, and storage practices—like those proposed by the VSSs—can have significant positive impacts on reducing contamination rates (Turner et al., 2005). On post-harvest losses, VSSs have much to offer farmers in the EAC and the regional policy objectives on the matter.

Takeaway Message: VSSs promote best practices in managing some of the specific challenges related to agricultural productivity faced in the EAC. Notably, aflatoxin contamination threatens the maize and wheat sectors in particular, and the VSSs examined have specific provisions on improving storage and handling to reduce this risk of mould contamination. For other agricultural productivity issues, such as the use of chemical or genetically modified inputs, VSSs can provide approaches for responsible ways forward that might provide a middle ground for some long-standing debates. This can be relevant for the bean, maize, grain, and rice sectors in the EAC, which all have challenges in improving the quality of inputs such as seed, fertilizer, and pesticides.

3.3.3 Boosting Intra-regional Trade – Medium alignment

There is medium alignment between the VSSs and the policy area “Boosting intra-regional trade.” This corresponds to the specific policy objectives of 1) reducing or eliminating non-tariff barriers to trade; 2) harmonizing trade standards, policies, and procedures; 3) improving market access; and 4) preventing and controlling transboundary pests and diseases in crops. This result (medium alignment) was anticipated, as many of the indicators developed by the authors are not traditionally in the domain of agricultural VSSs (e.g., harmonization of trade standards).

For the policy objective “Reducing or eliminating non-tariff barriers (NTBs) to trade,” each of the VSSs addresses the need to work toward recognition by other national, regional, and international production and quality standards (see Box 11 for excerpts

from the VSSs). This is important because there is a perception in the region that VSSs can themselves be NTBs to trade because of the additional production requirements they entail, the investment needed to comply with them, and the capacity that is required to verify VSS-compliant produce at border crossings and other points of trade (e.g., the 2011 CCP refers to eco-labels as NTBs). However, based on provisions like those shown in Box 11, the VSSs assessed can be used as tools to bring producers into alignment with the SPS measures led by national, regional, or international regulatory bodies while also providing much-needed guidance and capacity building on the topic. GLOBALG.A.P.’s IFA Standard, for instance, requires producers to have an internationally recognized Hazard Analysis Critical Control Point-based (HACCP) approach to food safety. The HACCP approach, in turn, has been adopted by the WTO’s international food safety standards (Codex Alimentarius).

In terms of the closely related policy objective of “Harmonizing trade standards, policies and procedures,” the benchmarking shows that, in some areas, VSSs can support EAC policy priorities. All VSSs require compliance with national policies and laws (usually on specific issue areas), and both the EAOPS and GLOBALG.A.P. make a specific reference to compliance with regional regulations (EAOPS makes reference specifically to the EAC), which could be leveraged to support harmonization—though no specific regional reference documents are mentioned (e.g., product catalogues, SPS measures, etc.).

Table 6. Benchmarking VSS content criteria against EAC policy – Enabling intraregional trade

VSS Content Criteria	East Africa Organic Products Standard (EAOPS)	Sustainable Rice Platform (SRP)	GLOBALG.A.P. IFA Standard
Reduce/ eliminate non-tariff barriers to trade			
Does the Standard require that quality management systems comply with local and national legislation? (700432)	⊘	✓	✓
Does the Standard require that quality management systems comply with regional (EAC) legislation?	⊘	⊘	⊘
Does the Standard work towards recognition with international standards or schemes?	✓	⊘	⊘
Does the Standard work towards recognition with other national standards or schemes?	✓	✓	✓
Does the Standard work towards recognition with EAC standards or schemes?	✓	✓	✓
Harmonization of standards, trade policies and procedures (quality, SPS, traceability)			
Does the Standard require compliance with all relevant local and national laws and regulations?	✓	✓	✓
Does the Standard require compliance with EAC policies and regulations? (34020)	✓	⊘	✓
Does the Standard make reference to EAC regional trade documents/ provisions (e.g. product catalogues, SPS regulations)?	⊘	⊘	⊘
Does the Standard require the unit of operation to maintain production records (e.g. materials used, inputs etc.)?	✓	✓	✓
Does the Standard require the establishment and monitoring of traceability systems (e.g. input/ varieties)? (300469)	✓	⊘	✓
Does the standard require the unit of operation to make reporting publicly available (e.g. sustainability reports/ annual reports/ financials)?	⊘	⊘	⊘

VSS Content Criteria	East Africa Organic Products Standard (EAOPS)	Sustainable Rice Platform (SRP)	GLOBALG.A.P. IFA Standard
Increase market access			
Does the Standard require the guarantee of a premium on sales of certified product? (1970)	⊘	⊘	⊘
Does the Standard address living wage based on sector or regional specificities? (1991)	⊘	⊘	⊘
Does the Standard promote cooperatives/ producer groups? (300479)	✓	✓	✓
Does the Standard address setting up contracts with traders? (1969)	⊘	⊘	⊘
Does the Standard address access to financial services (payment, credit, savings, subsidies)? (1973)	⊘	⊘	⊘
Does the Standard address distribution networks and access to markets/buyers? (1959)	✓	⊘	⊘
Does the Standard address training opportunities on agribusiness and/or use of information technology? (300471)	✓	⊘	⊘
Prevent and control transboundary pests and diseases in crops			
Does the Standard require training on pest management and disease control? (60002)	✓	✓	✓
Does the Standard address Integrated Pest Management / Integrated Pest Control? (2106)	✓	✓	✓
Does the Standard address pest and/or disease outbreaks?	✓	✓	✓
Does the Standard address introduction of alien invasive species? (700371)	⊘	✓	⊘
Does the Standard require quarantine procedures to be in place for pest and/or disease outbreaks? (701297)	⊘	⊘	✓
Does the Standard require prohibition of Hazardous Chemicals (WHO class 1A & B, Stockholm and Rotterdam Conventions)? (2100)	✓	✓	⊘
Does the Standard address selected and targeted application of chemicals (i.e. predefined volumes)? (60024)	✓	✓	✓

✓ Addressed/Yes

⊘ Not addressed/No

Box 11. Excerpts from VSSs on working toward recognition with other standards and operating contexts

EAOPS

Excerpt from Version 2007: https://kilimohai.org/fileadmin/02_documents/Standards/East_African_Organic_products_standard.pdf

The standard is intended for the development of organic production and trade in the East African region. The standards can be a platform for a common label for organic products in East Africa and for developing consumer trust. The standard also formulates standpoints which can be used in international negotiations on standards. Further, it can be a basis for equivalence agreements with other countries and regions.

SRP

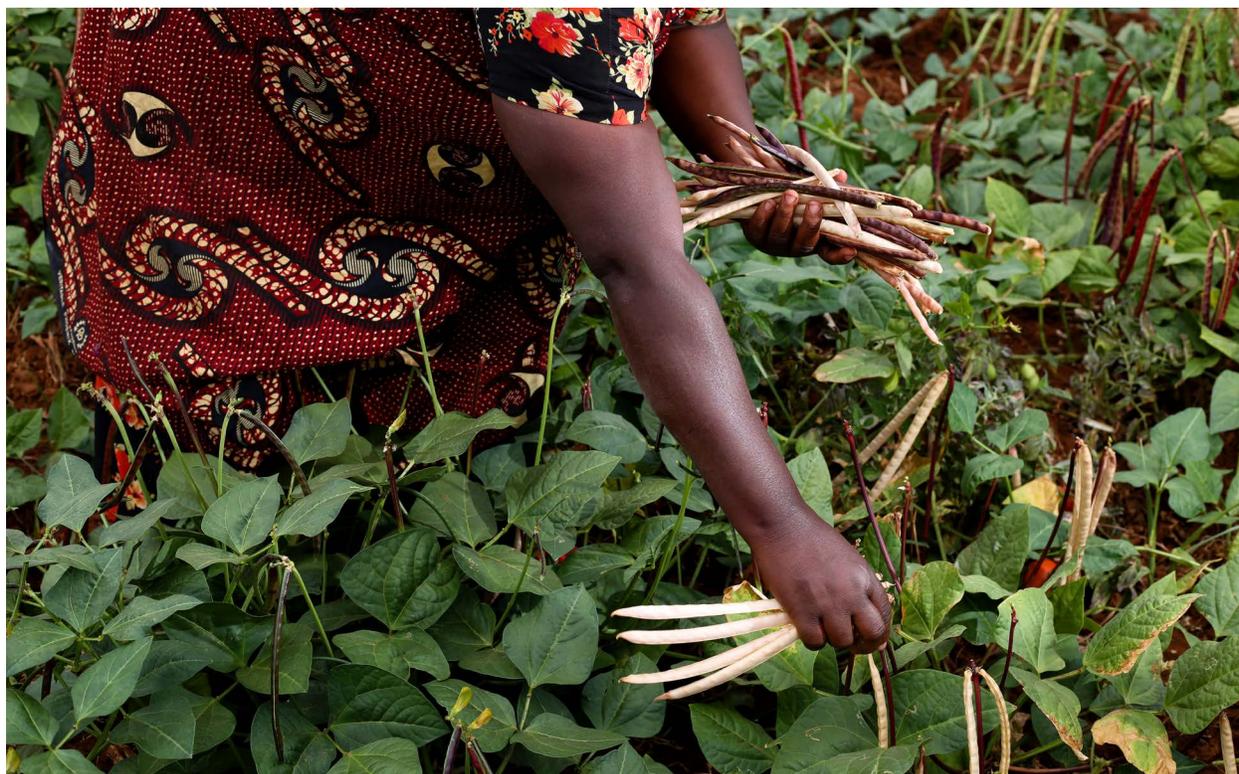
Excerpt from Version 2.1 (2020): <http://www.sustainableice.org/Resources/>

It is important to protect the integrity and core requirements of the SRP Standard while maximizing its relevance and practical applicability within diverse national contexts - including production systems, agroecological environments, socio-ecological circumstances, and legal and regulatory frameworks. While the Standard offers normative guidance, practitioners may need locally-relevant guidance on appropriate best practice recommendations that support the requirements of the Standard. National Interpretation Guidelines may therefore be developed to serve as a bridge between the global standard and local field application.

GLOBALG.A.P.

Excerpt from IFA V.5.2: <https://www.globalgap.org/it/gap-news/IFA-Version-5.2-whats-new/>

- c) The IFA Standard offers several benefits to producers:
 - (i) Reducing food safety risks in primary production by encouraging the development and adoption of national and regional farm assurance schemes and with a clear risk assessed HACCP based reference standard serving the consumer and food chain [...]



Top: Harvesting cowpeas in Msongozi village, Mvomero district, Tanzania
Bottom: Separating clean and unsuitable rice in Mvomero

Local Stakeholder Perspective

Value of production standards for food safety controls

As agricultural production standards, agricultural VSSs generally demand more rigorous care and attention to inputs, quality, handling, and safety than conventional production requires. Many stakeholders interviewed for this report expressed the view that if production standards—like those found in the VSSs—were widespread and trusted across the region, there would be less need for testing and procedures at the borders because the physical, chemical, and biological product requirements would be easily met. As such, some stakeholders suggest that meeting a product standard (i.e., SPS standards) through a production standard is an effective approach. Implementing a system based on production standards would require 1) their formal recognition at the national level and 2) the proper enforcement of the assurance systems (i.e., third-party certification and auditing).

Indirectly, the indicators on record keeping (covered by all three VSSs) can support harmonization because food safety verification procedures rely on, in addition to laboratory testing, detailed documentation of inputs used in production and processing. Similarly, the establishment of traceability systems (EAOPS and GLOBALG.A.P standards) could support harmonization indirectly by providing robust verification of a product's origin and treatment, potentially minimizing lengthy inspection processes at border crossings.

For the policy objective of “Improving market access,” it is also worth noting that all three VSSs promote cooperatives, farmer groups, and/or group certification. Such collectives can play a role in opening up opportunities for better market access that would be otherwise inaccessible to individual farmers (Evidensia, 2019). Beyond this point on cooperatives, indicators on facilitating contacts with traders or supporting access to financial services for farmers appear to go beyond the scope of the VSSs assessed. Similarly, guarantees on living wage or price premiums to certified

farmers are not covered by any of the VSSs. The EAOPS provides some services to producers that the other VSSs do not, notably agribusiness and IT training, and provides an innovative online platform to connect buyers and sellers of organic produce.

Finally, for the EAC policy objective on “Preventing and controlling transboundary pests and diseases in crops,” which is a critical issue in the EAC (see Box 2 for more information), there is strong alignment with the VSSs' content coverage. All three VSSs have criteria related to integrated pest management and disease control, which addresses pest control through measures such as crop rotations, changes to cultivation and seed choice, and the targeted use of pesticides if needed (among other measures), and as opposed to the use of synthetic chemical products (which can lead to pest resistance) (Barzman et al., 2015). All VSSs also address managing pest outbreaks and chemicals in an appropriate and environmentally safe way and all provide training to farmers on this crucial issue of pest control.

Local Stakeholder Perspective

The need for recognition and support of VSSs through official channels

The recognition of agricultural VSSs in the region by National Agricultural Ministries or National Bureaus of Standards would go a long way in building trust and support for their activities.

In Tanzania, Sustainable Agriculture Tanzania lobbied for recognition of the organic standard EAOPS by the Tanzania Bureau of Standards. The bureau now recognizes the standard and has laboratories where producers bring their organic products for testing and inspection (including radiology tests) before export. Only the National Bureau of Standards in the region recognizes the EAOPS (at the time of writing).

In Uganda, the National Bureau of Standards considers the SRP a process standard that, if followed, will enable the producers to easily meet the national product standards. Officials at the Ministry of Agriculture in Uganda recommend that farms use the SRP process standard for the same reason: to ensure that they meet the national product standards.

Takeaway Message: As was shown in Section 2 of this report, there is strong potential for greater intraregional trade of staple crops in the EAC, namely beans, maize, grain, and rice. VSSs have the potential to support this. Producer compliance with national and regional legislation and regulations is always required, which supports standardization and harmonization, and each of the VSSs assessed has provisions on working toward recognition and equivalence with other standard systems. The extent to which VSSs can support intraregional trade in practice, however, will depend on support and recognition through official channels with the Ministries of Agriculture or the national standards bureaus in the EAC Partner States. It will equally depend on the financial support provided to farmers to implement VSS-compliant practices and get certified.

3.3.4 Crosscutting Observations

In addition to each of the three EAC agricultural policy areas, there are some other crosscutting and more general ways in which VSSs may support—directly or indirectly—the implementation of EAC agricultural policy. These observations derive primarily through interviews undertaken with local and/or expert stakeholders (see Appendix D for a complete list of organizations consulted), as well as from the benchmarking assessment (Tables 6, 7, and 8). The list below describes additional ways in which VSSs can be enablers (+) or can generate barriers (-) to aligning agricultural production with EAC policy objectives.

Training opportunities (+)

Training opportunities offered by VSS systems are extensive. For the three VSSs analyzed in this report, training programs cover a range of topics, such as IT and

agribusiness management, reducing pre- and post-harvest losses, development of water management plans, responsible chemical management, starting agro-forestry, record keeping, and more. In addition, the SRP and GLOBALG.A.P offer training and coaching opportunities that provide farmers with additional business skills to enter regional and international markets. Training is also pertinent at the group level for farm organizations and cooperatives, with offerings on, for example, data management and internal control systems.

Building local demand for third-party verification (+)

VSS presence in a community can lead to an awareness and understanding of the benefits of not only sustainable production but also the practices of standardization, auditing, and third-party certification. Some stakeholders interviewed mentioned that farmers who participate in VSS auditing and verification processes, even using PGSs, are often better prepared for compliance with local and international requirements on other issue areas, such as food safety, pest and disease management, and environmental management. Moreover, VSS presence leads to a concrete demand for auditing and verification services in the local or regional economy.

Building personal and commercial relationships (+)

Many stakeholders interviewed shared the sentiment that participation in VSSs can foster connection, solidarity, transparency, trust, and friendship between farmers. Notably, this has been the case for farmers joining PGSs in Tanzania and Kenya (see Box 3).

In some cases, VSSs in the region have also been proactive in facilitating business relationships, such as between farmer cooperatives and processing and distribution companies interested in commercializing environmentally friendly rice (see Box 4 for an example of SRP in Uganda). Another example is the Agricultural Business Initiative (aBi) that is supporting farmers in Uganda in accessing certifications in order to comply with quality and safety requirements. Some stakeholders pointed to the success of VSSs in cash crop commodities such as coffee, tea, and horticulture and their export to international markets, indicating that there may be lessons there for building up VSS activity in domestic markets, showcasing best practice, and building the case for sustainable agriculture.

Platforms for multistakeholder dialogue (+)

The EAC Partner States could benefit from the collective knowledge, experience, and network of VSSs operating in the region by engaging them in multistakeholder dialogues and forums or by participating in forums organized by the VSSs themselves. The region has a growing ecosystem of organizations advancing the cause of sustainable agriculture. These include national organic movements such as the NOGAMU, TOAM, KOAN, and SAT. Other important players are Rikolto, GLOBALG.A.P., Kilimo Trust, and continent-wide initiatives such as the ARSO, ARSCP, and AEM EcoMark Africa. Such collaborations can help identify key sustainability opportunities and challenges and promote the sharing of regionally appropriate best practices.

Start-up costs and exclusion of smallholders (-)

Though the potential benefits of VSSs are recognized by many farmer associations and individual producers, there is a concern that VSSs can leave some farmers behind; the time, resources, and expertise required to become certified are cited as major hurdles for smallholders to overcome.

One response to this legitimate concern is to draw attention to VSSs that take a “building blocks” approach, like localg.a.p.’s three pre-certification levels. This option can be beneficial for smallholder farmers that are interested in participating in VSSs but do not have the resources to access and meet the requirements of full certification for distant export markets. Another option is PGSs used by the EAOPS, which are low-cost, locally focused quality management and verification systems. Both can be used to sell products in local markets and build recognition for the “sustainable agriculture” brand.

The establishment of incentives for practising farmers could be enhanced through, for example, the use of warehouse receipts for accredited produce, which can become a measure of improved credit rating to access debt/equity/insurance for farmers.

Lack of awareness of VSS activity and benefits, and wider trade knowledge (-)

There is a general perception in the region that VSSs are created in Western countries, that they are limited to use in cash crop commodities, and that they may not be adapted to local conditions. Moreover, interviews suggested a lack of awareness among producers, processors, and value

chain actors about the presence of VSSs in the region and their potential benefits. Some interviewees also informed us that VSS users themselves have very little knowledge about the opportunities that certification can present for marketing and trading. This knowledge gap is not limited to VSSs, however, as several stakeholders spoke about the low level of awareness among producers of regional trade protocols, policies, and quality standards (e.g., SPS protocol, CMP) and how they are implemented. This contributes to the informality of trade within and across the EAC Partner States.

Low demand for VSS-compliant products (-)

Our analysis and discussions with stakeholders lead to the conclusion that, at present, the demand for VSS-certified staple crops in domestic EAC markets is very low. Building this demand will be key for scaling up the potential of VSSs to advance sustainable agriculture in the region and for signalling the need for more private sector investment. There is evidence from Tanzania that local demand can be generated by focusing on the health benefits and the high-quality products of organic agriculture. For instance, there are successful specialty stores and supermarkets selling organic products (cereals, maize, pulses, sorghum, rice, vegetables, and spices) in Dar es Salaam that are sourcing produce from PGS-certified farmers in the surrounding region.

4.0 Recommendations



Man harvesting maize in Kinyenze village, Tanzania

4.1 For VSSs and Other Standard-Setting Bodies

Build VSS proof of concept through pilot projects

To increase the adoption of VSSs by farmers and cooperatives, it will be important to build legitimacy in the region through proof of concept and pilot projects that show that standards can be adapted to local and regional conditions and that there are benefits for farmers. The benefits can be diverse: more stable incomes, better soil quality and health, more efficient use of inputs such as water and fertilizers, and loss reduction with improved crop storage and pest management, for example. To grow the evidence base for the benefits of VSSs in the EAC, VSS bodies must be active in conducting more pilots, recording benefits and lessons, and sharing their findings through local and regional networks.

Moreover, it is important for all pilot projects to demonstrate how VSS-compliant production also meets local and regional food quality and safety regulations (i.e., SPS technical standards). This is essential if VSSs are to support EAC regional market integration, given that food safety and quality are two of the main barriers to intraregional trade.

Collaboration with other VSSs operational in the region may also help build local legitimacy. VSSs are already established in cash crop production in East Africa for coffee, tea, and horticulture. Platforms or events to share best practices and to provide lessons for VSSs in staple crops would also provide opportunities for local proof of concept.

Develop partnerships with processors, distributors, buyer groups, outlets, and consumer associations

Partnerships between producers, processors, distributors, buyer groups, outlets, and consumer associations can generate a market for VSS products. In South Africa, for example, big market players such as the retailer SPAR buy from smallholder farmers who implement GLOBALG.A.P. practices.

Partnerships with regulators should also be fostered, particularly with national standards bureaus. Creating awareness about VSS activity among officials could come through participation in policy forums, seeking out consultation opportunities, hosting platforms or dialogues, or even acting as a convenor across EAC jurisdictions by leveraging their role as a meso-level entity.

Prioritize accessibility to certification for farmers

Partnerships with producers and cooperatives that form the core of VSS activity should continue to adapt to local conditions to seek to find low-cost solutions for getting started. One way of doing this is through the design of the standard to offer a “step-by-step” approach to certification, starting with lower requirements for farmers and building over time.

Another option is through monitoring and verification schemes that do not require external auditing (and the costs associated with it) but rely instead on peer assessment through PGSs. As producers move toward third-party certification, a support ecosystem must be maintained by the VSSs to help farmers maintain their good practices and continuously improve over time.



Gathering sunflower seeds in Mvomero, Tanzania

Efforts need to be made to reach farmers who may not yet be aware of VSSs and their potential advantages. One option for raising awareness is through the establishment of sustainable farmer's markets, publicity and advertising, and educational programs.

Harness information technology

Information technology needs to be employed wherever possible to accelerate the adoption of more sustainable and resilient farming practices, which can also

potentially improve the accessibility and affordability of certification schemes for farmers. Digital solutions can offer faster and more accurate seed quality checks for seed producers and regulators, enabling quality in seed production and expediting licensing, certification, and trade processes with traceable records (CIMMYT, 2019). Data necessary for quality seed production, pest and disease surveillance, and the required checks to apply for commercial licences

can be shared in real time, linking seed companies, inspectors, and local authorities.

Other technological solutions include using remote sensing for monitoring, developing digital supply chain traceability systems, and providing online platforms to connect buyers and sellers. These tools should be used with the optic of lowering the costs of VSS implementation and compliance costs for farmers.

Expand training opportunities

One of the great advantages of VSSs for producers, as well as society and the economy, is the training opportunities they offer. This offer could be expanded to groups in the value chain, such as for national standards bureaus, border control officials, transport professionals, and buyers. Training modules developed and offered in coordination with SPS experts would add legitimacy and could lead to improved scaling up of intraregional trade.

4.2 For Policy-Makers in the EAC and EAC Partner States

Build political commitment for and recognition of VSSs

Political commitment to and official recognition of VSSs and their certification programs in regional and national processes (e.g., agricultural policy formation, development of trade agreements, establishment and enforcement of food quality and safety standards) is key to improving their potential impact and reach for improving intraregional trade.

At regional and continental levels, key institutions for building political commitment are COMESA, Southern Africa Development Community, ACTESA, and the African Union. Using these trade blocs and the opportunities they provide for coordination, the EAC can raise awareness about the various VSSs operating in the region and encourage Partner States to recognize them through official channels in the national ministries of agriculture or in the national standards bureaus.

With political will coming from the EAC Secretariat, national bodies could be encouraged to collaborate with VSSs; recognize VSS certification for intraregional trade between Partner States; authorize laboratories at border controls to assess VSS-certified produce; and develop knowledge and expertise on such production standards. As a first step, Partner States could host dialogues, platforms, or events to facilitate an exchange between agricultural ministries, national standards bureaus, and VSS bodies, and could commission studies on how VSSs perform in terms of SPS criteria, for example.

Inviting VSS bodies to participate in public processes, key events, and policy dialogues during implementation processes could draw on their wealth of knowledge on sustainable production and lead to potential collaboration. EAC and Partner State officials could also benefit from the “middle ground” many VSSs have identified on some specific issues facing the region, such as seed origin, the use of chemical inputs, and dealing with pest outbreaks. Involving VSS organizations in the policy process or at relevant events can be an occasion to benefit from their experience and to build bridges with civil society.

Communicate clearly on which standards will be supported

According to local stakeholders, there is a concern that the EAOPS has not been updated or adequately maintained since its establishment in 2007. Moreover, there is an indication from the Kenya Bureau of Standards that the EAOPS will not be pursued further in Kenya but will instead be replaced with a focus on the EcoMark Africa label. If there is a political or other reason for turning toward other VSSs across the EAC, such as EcoMark Africa, then this must be communicated clearly to stakeholders.

If, on the other hand, the EAOPS continues to operate at a regional level, it will require more organizational and funding support. A multistakeholder dialogue and process are needed to update the standard, as well as the designation of an office (or just an individual) in charge of EAOPS operations across the EAC and within the Partner States. Funding for these activities would need to be secured either through donor projects or, preferably, through core funding of the EAC from Partner States to build political will.

Provide targeted support for agricultural VSSs

- EAC officials and Partner States' governments should work toward the continuity of initiatives through its funding strategies and by sending clear and consistent policy priorities.
- A key avenue for supporting VSSs is through financial support to farmers for the start-up costs of certification. This could be through, for instance, grant programs covering the capital costs of infrastructure investment (e.g., storage

warehouses, renewable energy, and/or irrigation infrastructure), used for financing the first few years of third-party auditing, or for other costs related to training. In this way, the EAC could subsidize the costs of implementing the standards for smallholders, cooperatives, and small and medium-sized enterprises for a limited time period until farmers' revenues increase or leverage blended finance mechanisms to support this transition.

- EAC officials and Partner State governments can facilitate coordination among actors (i.e., government, non-governmental organizations, VSSs, buyers, and financial service providers) to help ensure smallholders have the services and support they need to comply with VSS and buyer requirements (i.e., VSSs' criteria, volume and quality of product, and legal requirements of the end market), maintain sales to VSS-compliant markets, and resolve questions and challenges as they arise. This can be done through public-private partnerships and by establishing forums for sectoral dialogue and coordination among actors and export/commercial readiness programs.
- Another way to provide targeted support is by generating demand for VSS-compliant produce. Developing sustainable public procurement policies and laws is one way to send a clear signal for sustainable agriculture. Specifically, adding requirements in catering tenders for public offices, schools, or military organizations that specify, for example, fair and safe

working conditions for producers can provide direct and indirect support for the work of VSSs. In addition to building public demand for VSS-compliant produce, it is possible to support local (private) demand for VSS-compliant produce by, for example, facilitating farmer's markets and providing public space to advertise for markets, and more generally through awareness-raising campaigns on the value of sustainable agricultural production practices.

- Finally, to build the scientific basis, the EAC or Partner States could target one or two crops as pilot projects, particularly as an occasion to

demonstrate how a production standard VSS can meet agricultural product standards related to quality and safety (SPS standards). In addition, they could commission scientific studies on VSSs and their outcomes in terms of the quality and safety of the agricultural produce—with the optic to align VSSs with SPS outcomes (physical, chemical, and biological). There is still proof of concept and awareness-raising work to be done, and support from the EAC and Partner States could build trust in and the legitimacy of VSSs in the region.



Sorting sunflower seeds in Mvomero, Tanzania

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Appendix A. Trade Data for Each Crop Sector

East African Community (EAC) countries' bean, maize, rice, and wheat trade flows averaged from 2015 to 2019 are provided in the tables below.

Table A1. Bean trade flows, average from 2015–2019

Importing	Exporting							Averaged import total
	Burundi	Kenya	Rwanda	South Sudan	Uganda	Tanzania	Other	
Burundi	0	356	842	0	1,540	82	1,745	4,565
Kenya	0	0	3,237	0	181,208	7,011	41,834	233,290
Rwanda	1,722	4	0	0	1,384	5,175	21	8,306
South Sudan	0	2,860	938	0	12,104	0	235	16,137
Uganda	0	964	7,758	0	0	1,294	1,023	11,039
Tanzania	15	0	15	0	971	0	1,228	2,229
Other	8	37,441	1,247	0	15,043	61,002	0	114,741
Average export total	1,745	41,625	14,037	0	212,250	74,564	46,086	

Table A2. Maize trade flows, average from 2015–2019

Importing	Exporting							Averaged import total
	Burundi	Kenya	Rwanda	South Sudan	Uganda	Tanzania	Other	
Burundi	0	78	2,264	0	7,051	13,296	10,007	32,696
Kenya	0	0	29	0	225,162	75,108	563,153	863,452
Rwanda	114	1,629	0	0	87,858	14,384	18,029	122,014
South Sudan	0	42	0	0	27,634	0	314	27,990
Uganda	571	1,818	102	0	0	31,605	921	35,017
Tanzania	0	1,579	125	0	15,523	0	65,989	83,216
Other	0	359	225	0	780	32,887	0	34,251
Average export total	685	5,505	2,745	0	364,008	167,280	658,413	

Table A3. Rice paddy (milled rice equivalent) trade flows, average from 2015–2019

Importing	Exporting							Averaged import total
	Burundi	Kenya	Rwanda	South Sudan	Uganda	Tanzania	Other	
Burundi	0	0	81	0	160	4,876	12,735	17,852
Kenya	0	0	0	0	1,328	2,390	644,913	648,631
Rwanda	1	103	0	0	1,497	8,960	134,131	144,692
South Sudan	0	55	0	0	16,451	2,642	15,105	34,253
Uganda	0	979	27	1	0	40,090	119,227	160,324
Tanzania	144	77	26	0	0	0	205,345	205,592
Other	30	612	47,064	24	32,018	4,865	0	84,613
Average export total	175	1,826	47,198	25	51,454	63,823	1,131,456	

Table A4. Wheat trade flows, average from 2015–2019

Importing	Exporting							Averaged import total
	Burundi	Kenya	Rwanda	South Sudan	Uganda	Tanzania	Other	
Burundi	0	0	5	0	3	2,242	101,445	103,695
Kenya	0	0	0	0	64	0	1,915,531	1,915,595
Rwanda	2	637	0	0	347	1,893	186,605	189,484
South Sudan	0	0	0	0	4	0	6	10
Uganda	0	7,043	10	0	0	28	639,123	646,204
Tanzania	0	16	0	0	0	0	1,027,823	1,027,839
Other	3	2,532	479	11	549	16,290	0	19,864
Average export total	5	10,228	494	11	967	20,453	3,870,533	

Appendix B. Summary of Sustainability Initiatives

Table B1. Bean sector initiatives

Lead organizations: Project	Short project description (purpose or objective)	Key benefits
Pan-Africa Bean Research Alliance (PABRA): PABRA Partnership	Transition beans from a subsistence crop to a modern commodity via breeding and delivering enhanced seed varieties (Birachi et al., 2011).	200 bean varieties were bred with improved resilience and nutritional qualities as well as desired characteristics by local and regional markets (Birachi et al., 2011; Rubyogo et al., 2010; Snapp et al., 2018).
Rikolto: FoodTrade Project	Improve post-harvest bean handling and storage to increase regional trade.	Improved post-harvest storage and handling, increased access to markets, and better management of the project's documentation and distribution. Farmers received 12% higher prices due to improved product quality and collective bargaining (Rikolto, 2019a).
Rikolto and Kilimo Trust	Assist rice, cassava, and soybeans smallholder farmers by fostering business relationships with bean processing companies (Rikolto, 2020c).	The project also focuses on enhancing food and nutritional security, increasing household incomes, and improving maternal and child nutrition and health in Northern Uganda (Franklin, 2020).

Lead organizations: Project	Short project description (purpose or objective)	Key benefits
Kilimo Trust: Bean Enterprises and Structured Trade in the East African Community (EAC)	<p>Expand structured trade for 10,000 to 15,000 small- and medium-scale farmers (SMSFs), who produce 30,000 MT/year of beans, to meet specific market demands (Kilimo Trust, 2017a).</p> <p>Establish 10–15 commercially viable businesses, each connecting 1,000 to 1,500 bean farmers to end markets.</p> <p>Support bean value chain stakeholder needs and increase the quantity and quality produced by the SMSFs in each business (Kilimo Trust, 2017a).</p>	<ol style="list-style-type: none"> 1. 10–15 commercially viable and sustainable business consortia (anchored on dedicated “Lead Firms”), each connecting 1,000 to 1,500 farmers to specific end markets of beans, as well as the necessary and sufficient business partners to adequately respond to the market opportunities. 2. Increased supply, efficiency, and cost-effectiveness of the necessary and sufficient business support services (such as market information, business skills, and financial services) to support the needs of different actors along the bean value chain to deliver their part in the business partnerships for structured trade. 3. Market-driven increase in quantity, aggregation, and quality of beans produced by the SMSFs in each consortium.

Table B2. Maize sector initiatives

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
The International Maize and Wheat Improvement Center (CIMMYT)	Water Efficient Maize for Africa	Aid farmers in managing droughts by deploying maize varieties yielding 24% to 35% more grain under moderate drought conditions (Edge et al., 2018; Water Efficient Maize for Africa, n.d.).	Farmers implementing these drought-resistant varieties benefited from greater incomes and access to food (Edge et al., 2018; WEMA, n.d.)

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
CIMMYT	Drought Tolerant Maize for Africa projects (CIMMYT, n.d.-a; Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa [SIMLESA], 2011). ²⁶	Drought Tolerant Maize for Africa aims to benefit around 40 million people by increasing yields via hybrid seeds, farmer training, extension services, and competitive seed markets.	Smallholder farmers in drought-affected areas increased their yields, from 2007 to 2012, producing additional crop worth USD 160 million–200 million per year. It also engaged with government bodies to fast-track the release of improved varieties (CIMMYT, n.d.-c).
CIMMYT	SIMLESA	The project also supports the implementation of locally adapted and smallholder-appropriate conservation farming methods, local seed systems, sustainable intensification technologies, innovation platforms, and knowledge exchange between African countries and Australia.	Facilitated the release of 40 new maize varieties selected for their drought tolerance and suitability for maize-legume intercropping (SIMLESA, 2011).
African Agricultural Technology Foundation (AATF)	Technologies for African Agricultural Transformation (TAAT) Maize Compact project	Promote the adoption of climate-smart maize technologies like water-efficient maize varieties (AATF, n.d.-a). ²⁷	The TAAT Maize Compact project will bring water-efficiency technologies to 2 million households, assist 12 million farmers in benefiting from climate-smart maize technologies, and produce and distribute 30,000 tonnes of climate-smart maize seeds.

²⁶ The CIMMYT works to produce a higher grain yield through the application of cutting-edge tools and technologies, including doubled haploids, molecular markers, and high-throughput field-based phenotyping (CIMMYT, n.d.-b).

²⁷ More specifically, the TAAT Maize Compact project will bring water-efficiency technologies to two million households, assist 12 million farmers in benefiting from climate-smart maize technologies, and produce and distribute 30,000 tonnes of climate-smart maize seeds.

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
AATF	TELA project	A public–private partnership working toward the commercialization of transgenic drought-tolerant and insect-resistant maize varieties (AATF, n.d.-b).	The increased cultivation of the climate-smart Drought TEGO variety has increased food security in Kenya (Muinga et al., 2019). The TEGO varieties can provide yields of 8–12 tonnes/ha in sub-Saharan Africa, far greater than the average yield of 1.4 tonnes/ha.
Rikolto	FoodTrade project	Increase trade and maize, rice, and bean farmer incomes by focusing on post-harvest handling and storage and increasing regional trade.	Farmers received 12% higher prices due to improved product quality and collective bargaining power (Rikolto, 2019).

Table B3. Rice sector initiatives

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
Rikolto and Tanzania Agriculture Research Institute		Establish quality-management systems in various regions to improve rice quality, which has enabled rice farmers to produce, process, and trade in higher-quality markets to obtain better prices (Rikolto, 2020b).	As part of its exit strategy, the partnership aims to improve the business environment for Tanzanian rice farmers, strengthen farming organizations, and enable better access to finance for smallholder rice farmers (Rikolto, 2020b).

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
Rikolto, Tanzania Agriculture Research Institute and East African Grain Council		Set up an SMS system to update farmers on the latest market prices, and enable, with the Microfinance Support Centre, access to finance.	Smallholder farmers in drought-affected areas increased their yields, from 2007 to 2012, producing additional crop worth USD 160 million–200 million per year. It also engaged with government bodies to fast-track the release of improved varieties (CIMMYT, n.d.-c).
Kilimo Trust and Rikolto	SIMLESA (SIMLESA, 2011).	Link smallholder rice, cassava, and soybean farmers in Northern Uganda with processing companies to purchase their harvest (Rikolto, 2020c).	The project assists farmers in assessing market opportunities and facilitates market exchanges. It also focuses on enhancing food and nutrition security, household incomes, and maternal and child nutrition and health in Northern Uganda (Franklin, 2020).
AfricaRice		The Pan-African Centre of Excellence for rice research and development works on poverty alleviation, food and nutrition security, and farming livelihoods with rice value chain actors by increasing the productivity, profitability, and sustainability of rice-based agri-food systems (AfricaRice, n.d.).	These efforts aim to reduce rice imports.

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
The International Rice Research Institute (IRRI) ²⁸		Aims to develop and deliver rice varieties tolerant to abiotic stresses (IRRI, n.d.).	The project ended in 2019 and delivered improved varieties to more than 18 million farmers in Africa and South Asia, which resulted in multiple seed exchange agreements (IRRI, n.d.).
EAC and Kilimo Trust	The Competitive African Rice Initiative in East Africa	The project is financially supporting rice farmers via a USD 3.1 million-dollar grant over 3 years. It focuses on establishing a rice traceability, certification, and trade mechanism for the EAC. It also aims to promote the Protocol on Sanitary and Phytosanitary Measures developed by the EAC (EAC, 2019, p. 20).	The main activities include support for governments to establish clear rice development plans as well as to mobilize private sector investments in rice mills and public sector investments in irrigated rice schemes.
National Initiative	Tanzania National Rice Development Strategy II	Work toward enabling rice self-sufficiency and market leadership by producing improving rice-production quality and quantity.	The National Rice Development Strategy II is working on improving rice-cultivation climate resilience, enhancing regional rice quality above imports, expanding the rice cultivation area, and orienting Tanzanian rice farming systems, particularly smallholder systems, toward national and regional markets (Tanzania Ministry of Agriculture & Japan International Cooperation Agency, 2019).

²⁸ The IRRI works to improve food and nutrition security and economic growth by incorporating cutting-edge science in the rice value chain, designing sustainable agri-food systems, and fostering transformative partnerships (IRRI, n.d.). They develop and deploy climate-resilient and market-competitive rice varieties and best management practices for productive, nutrition-balanced, and profitable rice-based systems (IRRI, n.d.).

Table B4. Wheat sector initiatives

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
Climate and Development Knowledge Network and the East African Grain Council		Increase wheat-farming climate resilience by proposing the following policy and management approaches (ReliefWeb, 2019): 1) improving weather information and knowledge exchange, 2) strengthening incentives for forming farmer cooperatives, 3) improving access to finance and index-based crop insurance, 4) mapping organizations providing climate-smart services to prevent duplication and inform stakeholders about where they can access support, and 5) tracking national grain surplus and deficits to improve trade and reduce inflated prices from poor harvests in any one region.	These efforts will hopefully lead to more climate resilient farmers with better access to networks and information needed to withstand climatic shocks and perturbations (ReliefWeb, 2019).
CIMMYT		Adopted a Variety Identification Number system.	A unique barcode for each variety, which contains information about the organization that produced the variety, the year of release, the crop, and its specific traits, such as drought tolerance, the country where it is produced, and other relevant data. It will facilitate cross-border seed trade and help track seed fraud (CIMMYT, 2019).

Lead organizations	Initiative	Short project description (purpose or objective)	Key benefits
CIMMYT	Wheat research program	Aims to develop climate-resilient and high-yielding, disease-tolerant wheat varieties by using the latest molecular breeding tools and bioinformatics (CIMMYT, n.d.-b). They assist farmers in realizing the full potential of improved wheat varieties and associated market opportunities (CIMMYT, n.d.-b). ²⁹ They are also conducting research to help farmers exploit the full potential of improved seed while conserving soil and water resources and aiding in the exploration of new market opportunities for smallholder farmers (CIMMYT, n.d.-b).	The CIMMYT's wheat research program in Kenya has worked with CIMMYT for more than 40 years and hosts the world's biggest screening facilities for wheat rust diseases, with up to 40,000 accessions tested each year.

²⁹ The CIMMYT applies precise phenotyping approaches, phenotyping platforms, and other tools, like remote sensing, to develop genetically diverse wheat varieties to attain annual global genetic yield gains of at least 0.7 % (CIMMYT, n.d.-c).

Appendix C. Full List of Policies Considered

- Comprehensive Africa Agriculture Development Programme (CAADP)
- East African Community Agriculture and Rural Development Policy (EAC–ARDP, 2006)
- East African Community Agriculture and Rural Development Strategy (ARDS, 2006)
- East African Community Development Strategy
- East African Community Food Security Action Plan (FSAP)
- East African Community Common Market Protocol (CMP)
- East African Community Vision 2050 (2015)
- East African Community Common External Tariff (2017)
- East African Community Cooperative Societies Bill (2014)
- East African Community Climate Change Policy (CCP) (2011)
- East African Community Climate Change Strategy and Climate change Master Plan (2011–2031)
- East African Community Protocol on Sanitary and Phytosanitary (SPS) Measures
- East African Community Customs Union Protocol
- Catalogue of East African Community Standards
- East African Community Agriculture and Food Strategy
- East African Community Industrialization Policy and Strategy
- East African Community Regional Agriculture Investment Plan

Appendix D. Organizations Consulted

- Agricultural Business Initiative (Abi)
- Embassy to Denmark, Kampala
- International Federation of Organic Agriculture Movements (IFOAM)
- National Organic Agricultural Movement of Uganda (NOGAMU)
- Servicio Agrícola y Ganadero (SAG), Government of Chile
- Sustainable Agriculture Tanzania (SAT)
- GLOBALG.A.P.
- Embassy of Sweden in Uganda
- Rikolto
- Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA)
- Eastern Africa Farmers Federation (EAFF)
- Kenya Organic Agriculture Network (KOAN)
- East African Community (EAC) Secretariat
- Common Market for Eastern and Southern Africa (COMESA) Secretariat

Appendix E. Benchmarking of localg.a.p.

VSS Content Criteria	localg.a.p Entry Level	localg.a.p Foundation Level	localg.a.p Intermediate Level
Implementation of good agricultural practices			
Does the Standard require sustainable management and use of natural resources? (30015)	⊘	⊘	⊘
Does the Standard address conditions of employment? (2588)	⊘	⊘	⊘
Does the Standard Body provide training and knowledge opportunities for farmers?	✓	✓	✓
Does the Standard address high quality agricultural inputs?	⊘	⊘	✓
Does the Standard specific climate adaptation activities? (701327)	⊘	⊘	✓
Does the Standard address legal land title and use rights? (4071)	⊘	⊘	⊘
Increasing yields: efficient use of fertilizers and seeds			
Does the Standard promote training for farmers on the use of inputs (fertilizers, chemicals, management practices)? (60012)	✓	✓	✓
Does the Standard promote access and selection of inputs and varieties (traditional versus improved/engineered)? (300467)	⊘	⊘	⊘
Does the Standard address diversity of planting materials, seeds and crop genotypes? (2657)	⊘	⊘	⊘
Does the Standard require sustainable use of fertilizer (e.g. amount per unit of land)? (700349)	✓	✓	✓
Reduce pre- and post-harvest losses			
Does the Standard require quality control processes for product transportation? (4065)	✓	✓	✓

VSS Content Criteria	localg.a.p Entry Level	localg.a.p Foundation Level	localg.a.p Intermediate Level
Does the Standard address quality of storage facilities (warehouses, cold storage, etc.)? (700443)	✓	✓	✓
Does the Standard require monitoring, measurement and reduction of waste? (10082)	✓	✓	✓
Does the Standard address training/knowledge transmission on pre and post harvest losses?	⊘	⊘	✓
Reduce/ eliminate non-tariff barriers to trade			
Does the Standard require that quality management systems comply with local and national legislation? (700432)	⊘	⊘	✓
Does the Standard require that quality management systems comply with regional (EAC) legislation?	⊘	⊘	⊘
Does the Standard work towards recognition with international standards or schemes?	✓	✓	✓
Does the Standard work towards recognition with other national standards or schemes?	⊘	⊘	⊘
Does the Standard work towards recognition with EAC standards or schemes?	⊘	⊘	⊘
Harmonization of standards, trade policies and procedures (quality, SPS, traceability)			
Does the Standard require compliance with all relevant local and national laws and regulations?	✓	✓	✓
Does the Standard require compliance with EAC policies and regulations? (34020)	✓	✓	✓
Does the Standard make reference to EAC regional trade documents/ provisions (e.g. product catalogues, SPS regulations)?	⊘	⊘	⊘
Does the Standard require the unit of operation to maintain production records (e.g. materials used, inputs etc.)?	✓	✓	✓
Does the Standard require the establishment and monitoring of traceability systems (e.g. input/ varieties)? (300469)	✓	✓	✓

VSS Content Criteria	localg.a.p Entry Level	localg.a.p Foundation Level	localg.a.p Intermediate Level
Does the standard require the unit of operation to make reporting publicly available (e.g. sustainability reports/ annual reports/ financials)?	⊘	⊘	⊘
Increase market access			
Does the Standard require the guarantee of a premium on sales of certified product? (1970)	⊘	⊘	⊘
Does the Standard address living wage based on sector or regional specificities? (1991)	⊘	⊘	⊘
Does the Standard promote cooperatives/ producer groups? (300479)	✓	✓	✓
Does the Standard address setting-up contracts with traders? (1969)	⊘	⊘	⊘
Does the Standard address access to financial services (payment, credit, savings, subsidies)? (1973)	⊘	⊘	⊘
Does the Standard address distribution networks and access to markets/buyers? (1959)	✓	✓	✓
Does the Standard address training opportunities on agribusiness and/or use of information technology? (300471)	⊘	⊘	⊘
Prevent and control transboundary pests and diseases in crops			
Does the Standard require training on pest management and disease control? (60002)	✓	✓	✓
Does the Standard address Integrated Pest Management / Integrated Pest Control? (2106)	⊘	⊘	✓
Does the Standard address pest and/or disease outbreaks?	✓	✓	✓
Does the Standard address introduction of alien invasive species? (700371)	⊘	⊘	⊘
Does the Standard require quarantine procedures to be in place for pest and/or disease outbreaks? (701297)	⊘	⊘	✓

VSS Content Criteria	localg.a.p Entry Level	localg.a.p Foundation Level	localg.a.p Intermediate Level
Does the Standard require prohibition of Hazardous Chemicals (WHO class 1A & B, Stockholm and Rotterdam Conventions)? (2100)	⊘	⊘	⊘
Does the Standard address selected and targeted application of chemicals (i.e. predefined volumes)? (60024)	✓	✓	✓
Better management of land & soil resources			
Does the Standard require biodegradation of organic matter waste (composting)? (2051)	✓	✓	✓
Does the Standard address soil resources condition? (2059)	✓	✓	✓
Does the Standard address soil resources contamination? (10060)	✓	✓	✓
Does the Standard require procedures to be in place for the use of organic fertilizers (or biofertilizer)? (700347)	✓	✓	✓
Does the Standard require agro-chemical waste management? (2577)	✓	✓	✓
Efficient use of water resources in agriculture (irrigation)			
Does the Standard address water extraction/irrigation? (10086)	✓	✓	✓
Does the Standard address water dependencies and water scarcities? (2036)	✓	✓	✓
Does the Standard address emergency response plans (e.g. strategies for floods and droughts)? (701326)	⊘	⊘	⊘
Does the Standard require a water management plan? (300663)	✓	✓	✓
Does the Standard address water reuse, recycling and harvesting? (2032)	⊘	⊘	⊘

VSS Content Criteria	localg.a.p Entry Level	localg.a.p Foundation Level	localg.a.p Intermediate Level
Promote forest conservation and agro-forestry systems			
Does the Standard require procedures in place for reforestation? (2069)	⊘	⊘	⊘
Does the Standard require procedures in place to prevent/ remediate deforestation? (2071)	⊘	⊘	⊘
Does the Standard address the conversion of forests into production land? (2072)	⊘	⊘	⊘
Does the Standard promote agro-forestry systems?	⊘	⊘	⊘
Does the Standard address ecosystem restoration/ rehabilitation? (2124)	⊘	⊘	⊘
Does the Standard address the protection of rare, threatened and endangered ecosystems? (700370)	⊘	⊘	⊘
Does the Standard address protection of High Conservation Value Areas? (4090)	⊘	⊘	⊘

✓ Addressed/Yes

⊘ Not addressed/No

Appendix F. Policy Excerpts

Table F1. Excerpts of policy objectives related to agricultural productivity in the East African Community

Relevant policy	Excerpts from policy objectives: Agricultural productivity
Common Market Protocol (CMP), art. 45.1	<p>The Partner States undertake to:</p> <ul style="list-style-type: none"> • <i>(a) Sustainably develop and promote agriculture with regard to crops, livestock, fish, forests and their products; and</i> • <i>(b) Ensure food security in the Community through access to quality and sufficient food.</i>
CMP, art. 45.2	<p>The objectives of promoting agriculture and ensuring food security in the Common Market, which shall be to:</p> <ul style="list-style-type: none"> • <i>(a) increase agricultural production and productivity;</i> • <i>(...)</i>
CMP, art. 45.3	<p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(a) cooperate in agricultural research and development;</i> • <i>(b) cooperate in plant breeding;</i> • <i>(c) promote the production and distribution of quality seeds of crops, livestock, fish and forest trees;</i> • <i>(d) develop capacity in the agricultural sector;</i> • <i>(e) cooperate in breeding, multiplication, distribution and artificial insemination of livestock including domesticated animals;</i> • <i>(g) cooperate in the control of plant and animal pests, vectors and diseases;</i> • <i>(i) develop, promote and manage forests and forestry products;</i> • <i>(j) promote and support the development of sustainable water use and irrigation facilities;</i> • <i>(m) establish and promote the availability of farm inputs and implements in sufficient quantities in the Partner States; and</i> • <i>(n) promote and encourage private sector participation in agricultural commercial activities and provision of support services.</i>

Relevant policy	Excerpts from policy objectives: Agricultural productivity
<p>Agriculture and Rural Development Policy (ARDP), art. 4.1.3 Food Security</p>	<p>Objective: The overall objective is to attain food security through increased agricultural production, processing, storage and marketing.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>vi. Promote technologies that reduce post-harvest losses;</i> • <i>vii. Promote appropriate use of agricultural inputs;</i> • <i>viii. Promote use of agricultural machinery and other labour-saving technologies; and</i> • <i>ix. Promote appropriate methods.</i>
<p>ARDP, art. 4.2.3 Crop Production</p>	<p>Objective: The main objective is to improve and intensify crop production in the region to meet local and export requirements for food and raw materials.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Support development of joint research programs and foster cooperation with regional organizations to facilitate transfer of research developments from other regions;</i> • <i>ii. Develop common policies, joint Early Warning Systems and operations for disease and pest control, sanitary and phytosanitary services and establishment of regional referral laboratories for certification;</i> • <i>iii. Promote the development of private sector-led production, input supply, trade, processing and value addition;</i> • <i>v. Develop and adopt regulatory procedures for managing crop pests;</i> • <i>vii. Promote capacity building to support development of programmes for agricultural mechanization; and</i> • <i>viii. Promote appropriate irrigation technologies.</i>
<p>ARDP, art. 4.6.3 Research, Extension and Training</p>	<p>Objective: The overall objective in research, training and extension is to enhance agricultural production and productivity through effective research–extension–training–farmer linkages.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Promote joint initiatives, mobilization of resources, co-ordination and dissemination of research information;</i> • <i>ii. Promote capacity building and sharing of training facilities;</i> • <i>iii. Promote information sharing, networking, and staff exchange programmes; and</i> • <i>iv. Promote participatory extension, research and training.</i>
<p>Climate Change Policy (CCP), ch. 3, 3.1.3.3 Sector Objectives</p>	<p>Agriculture and Food Security</p> <p><i>Specific Sectoral Objectives: Develop adaptation framework for agriculture to improve agricultural productivity and enhance food security.</i></p>

Relevant policy	Excerpts from policy objectives: Agricultural productivity
CCP, ch. 3, 3.1.3.3 (v) Adaptation	<p>Land Use and Soil Protection</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Promote sustainable land use and land use change management practices;</i> • <i>(ii) Improve land productivity and soil fertility, inter alia, through integrated nutrient management; improving soil quality; enhancing soil and water conservation measures, to enhance physical, chemical, biological or economic properties.</i>
CCP, ch. 3, 3.1.3.3 (vi)	<p>Forestry and Wetlands</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(vi) Promote improvement of agricultural productivity so as to avoid deforestation and encroachment on gazetted wetlands for agricultural expansion.</i>

Table F2. Excerpts of policy objectives related to intraregional trade in the East African Community

Relevant policy	Excerpts from policy objectives: Market integration and agriculture
CMP, art. 4	<p>The overall objective of the Common Market is to widen and deepen cooperation among the Partner States in the economic and social fields for the benefit of the Partner States. The specific objectives of the Common Market are to:</p> <ul style="list-style-type: none"> • <i>(a) accelerate economic growth and development of the Partner States through the attainment of the free movement of goods, persons and labour, the rights of establishment and residence and the free movement of services and capital;</i> • <i>(b) strengthen, coordinate and regulate the economic and trade relations among the Partner States in order to promote accelerated, harmonious and balanced development within the Community;</i> • <i>(c) sustain the expansion and integration of economic activities within the Community, the benefit of which shall be equitably distributed among the Partner States;</i> • <i>(d) promote common understanding and cooperation among the nationals of the Partner States for their economic and social development; and</i> • <i>(e) enhance research and technological advancement to accelerate economic and social development.</i>

Relevant policy	Excerpts from policy objectives: Market integration and agriculture
CMP, art. 5.3	<p>For the purposes of facilitating the implementation of the Common Market, the Partner States further agree to:</p> <ul style="list-style-type: none"> • <i>(m) sustainably develop and promote agriculture and ensure food security in the Community.</i>
CMP, art. 45.1	<p>The Partner States undertake to:</p> <ul style="list-style-type: none"> • <i>(a) sustainably develop and promote agriculture with regards to crops, livestock, fish, forestry and their products; and</i> • <i>(b) ensure food security in the Community through access to quality and sufficient food.</i>
CMP, art. 45.2	<p>The objectives of promoting agriculture and ensuring food security in the Common Market, which shall be to:</p> <ul style="list-style-type: none"> • <i>€ promote investments in agriculture and food security;</i> • <i>(d) develop effective agricultural markets and marketing systems in the Community; and</i> • <i>(e) promote agro-processing and value addition to agricultural products.</i>
CMP, art. 45.3	<p>Partner states shall:</p> <ul style="list-style-type: none"> • <i>(a) cooperate in agricultural research;</i> • <i>(g) cooperate in the control of plant and animal pests, vectors and diseases;</i> • <i>(k) stabilize markets and ensure the availability of supplies for both domestic consumption and exports;</i> • <i>(l) establish an effective regime of sanitary and phytosanitary measures, standards and technical regulations;</i> • <i>(n) promote and encourage private sector participation in agricultural commercial activities and provision of support services.</i>
CMP, art. 47.1	<p><i>The Partner States undertake to approximate their national laws and to harmonise their policies and systems, for purposes of implementing this Protocol.</i></p>

Relevant policy	Excerpts from policy objectives: Market integration and agriculture
ARDP, art. 4.7.3 Plant and Animal Pests and Diseases	<p>Objective: The overall objective is to reduce the impact of pests and diseases for plants and animals in order to promote sustainable production and trade.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Develop and harmonize policies, legislation and standards on plants and animals and their respective products quality control and safety assurance.</i> • <i>ii. Establish and coordinate mechanisms for monitoring and surveillance for transboundary pests and diseases of plants and animals; and</i> • <i>iii. Promote research and development in pests and diseases management programmes.</i>
ARDP, art. 4.10.3 Processing and Marketing	<p>Objective: The overall objective is to improve access of agricultural products to domestic and international markets.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Facilitate trade liberalization for agricultural commodities;</i> • <i>ii. Develop transboundary market infrastructure, flow of market information/ research and supply of power to facilitate agro-processing and rural industrialization and participation of the private sector;</i> • <i>iii. Eliminate applicable tariffs on agricultural produce in accordance with East African Community Customs Union Protocol;</i> • <i>iv. Harmonize sanitary and phytosanitary requirements;</i> • <i>v. Establish joint monitoring efforts and negotiation strategies for the export of agricultural commodities; and</i> • <i>vi. Promote development of agro-processing/value-adding capacity in the region.</i>
ARDP art. 4.15.3 Legal and Regulatory Framework	<p>Objective: To create an enabling legal and regulatory framework for agricultural and rural development.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Harmonize and enforce existing agricultural legislation in the Partner States;</i> • <i>ii. Enact further legislation and regulations on sanitary and phytosanitary issues, standards and technical regulations on trade and agriculture.</i>

Relevant policy	Excerpts from policy objectives: Market integration and agriculture
CCP, ch. 3, 3.1.3.3 (ii) Adaptation	Agriculture and Food Security Sector Specific Objective: Develop adaptation framework for agriculture to improve agricultural productivity and enhance food security. Partner States shall: <ul style="list-style-type: none"> • (vi) Increase use of integrated crop and livestock pests and disease management in the region; • (viii) Improve food management and distribution systems to ensure access and affordability; • (x) Promote harmonization of their policies, strategies and standards of their agricultural, livestock and fisheries research institutions and organizations.
CCP, ch. 4, 4.2.2 Implementation and Resource Mobilization Plan	Technology Development and Transfer Partner States shall: <ul style="list-style-type: none"> • (i) Enhance technology development and transfer, including hard technological solutions such as drip irrigation, water harvesting, drought tolerant crop varieties, renewable energy technologies and building technologies; and soft technology such as knowledge, systems, procedures and best practices; • (ii) Address technology transfer barriers, including rules of trade tariffs, intellectual property right (IPR) and technical trade barriers such as standards, eco-labeling; and • (iii) Enhance and support research and development capacity in East Africa to foster the development and local manufacture of cleaner production technologies to support climate change mitigation and adaptation.

Table F3. Excerpts of policy objectives related to climate change and agriculture

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
CMP, art. 40.1	<i>The Partner States undertake to ensure sound environmental and natural resources management principles for the proper functioning of the Common Market, through prevention of activities that are detrimental to the environment.</i>
CMP, art. 40.3	<i>The Partner States shall respect the principles of international environmental law and honour their commitments in respect of international agreements which relate to environmental management.</i>

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
CMP art. 40.4	<i>The Partner States shall develop common policies in responding to emerging issues on the environment.</i>
CMP, art. 40.5	<i>The provisions of this article shall not preclude the Partner States from maintaining or introducing more stringent protective measures regarding the environment, where the measures are compatible with this Protocol.</i>
CCP, ch. 3, 3.1.3.3 (ii) Adaptation	<p>Agriculture and Food Security</p> <p>Specific Sectoral Objectives: Develop adaptation framework for agriculture to improve agricultural productivity and enhance food security.</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Promote sustainable land management practices, including conservation agriculture and improved production systems, as part of a climate change adaptation strategy;</i> • <i>(ii) Promote development and implementation of irrigated agriculture through irrigation policies;</i> • <i>(iii) Promote water availability and sustainable use practices and technologies in agriculture, livestock and aquaculture for efficient utilization of water, especially in arid and semi-arid lands (ASALs);</i> • <i>(iv) Promote agro-processing and enhance food storage facilities;</i> • <i>(v) Promote efficient livestock and aquaculture production systems, including fodder and pasture storage and availability;</i> • <i>(vi) Increase use of integrated crop and livestock pests and disease management in the region;</i> • <i>(vii) Improve management of natural resources (land, water, fisheries and forest) in order to ensure sustainable production; and</i> • <i>(viii) Improve food management and distribution systems to ensure access and affordability;</i> • <i>(ix) Strengthen agro-meteorological information generation for improved early warning systems for food security; and</i> • <i>(x) Promote harmonization of their policies, strategies and standards of their agricultural, livestock and fisheries research institutions and organizations.</i>

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
<p>CCP, ch. 3, 3.1.3.3 (v) Adaptation</p>	<p>Land Use and Soil Protection</p> <p>Sector Specific Objective: To improve sustainable land use, land use change and soil management practices as an adaptation strategy.</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Promote sustainable land use and land use change management practices;</i> • <i>(ii) Improve land productivity and soil fertility, inter alia, through integrated nutrient management; improving soil quality; enhancing soil and water conservation measures, to enhance physical, chemical, biological or economic properties;</i> • <i>(iii) Promote actions that reduce land degradation and soil erosion, especially in the fragile ecosystems such as mountainous areas, lake shores and riverbanks; and</i> • <i>(iv) Facilitate formulation of integrated sustainable land management investment frameworks and land use policies and plans.</i>
<p>CCP, ch. 3, 3.1.3.3 (vi) Adaptation</p>	<p>Forestry and Wetlands</p> <p>Sector Specific Objective: To promote sustainable management of forestry and wetlands as part of ecosystem-based adaptation.</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Promote sustainable management of forests and wetlands in the region;</i> • <i>(ii) Promote alternative energy sources in order to reduce dependency on biomass for energy needs in both urban and rural areas;</i> • <i>(iii) Promote reforestation, afforestation and agro-forestry practices and programmes;</i> • <i>(iv) Strengthen enforcement of laws and good governance of forests and wetlands;</i> • <i>(v) Promote collaborative forest management practices;</i> • <i>(vi) Promote improvement of agricultural productivity so as to avoid deforestation and encroachment on gazetted wetlands for agricultural expansion;</i> • <i>(vii) Strengthen capacity to monitor and manage forests and forest-related activities;</i> • <i>(viii) Promote and strengthen community-based management practices;</i> • <i>(ix) Promote use of non-timber forest products; and</i> • <i>(x) Promote stakeholder participation in integrated forest and watershed management practices.</i>

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
<p>CCP, ch. 3, 3.2.4 (iii) Mitigation</p>	<p>Forestry</p> <p>Sector Specific Objective: To ensure that the forest sector continues providing global services in mitigation of climate change while supporting sustainable development needs of the Partner States.</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(iii) Promote reforestation and afforestation using appropriate tree species;</i> • <i>(iv) Strengthen research and promote data and information exchange;</i> • <i>(vi) Increase indigenous forest cover by promoting a variety of forestry species;</i> • <i>(vii) Support appropriate mechanisms to reward or provide incentives for forest conservation and avoidance of deforestation;</i> • <i>(viii) Promote activities that enhance the carbon storage capacity from forest ecosystems; and</i> • <i>(ix) Address all drivers of deforestation and forest degradation, taking into account specific national circumstances within the context of REDD.</i>
<p>CCP, ch. 3, 3.2.4 (iv) Mitigation</p>	<p>Agriculture</p> <p>Sector Specific Objective: Developing environmentally friendly and efficient agricultural practices, including crop and livestock production systems.</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Upscale activities that enhance carbon storage capacity, such as conservation agriculture and agroforestry;</i> • <i>(ii) Support development of joint research programs (including research on drought, pests and disease resistant crops and livestock), and foster cooperation with regional organizations to facilitate transfer of research developments from other regions;</i> • <i>(iii) Support best agricultural practices that lead to reduced emissions, such as soil conservation;</i> • <i>(iv) Promote efficient crop and livestock production systems to reduce emissions associated with agricultural practices;</i> • <i>(v) Develop methodologies for measuring and monitoring carbon sequestration in agricultural and agro-forestry systems to attract financial support for the international community; and</i> • <i>(vi) Use and maximize opportunities from the international carbon market.</i>

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
<p>CCP, ch. 3, 3.2.4 (v) Mitigation</p>	<p>Waste Management</p> <p>Sector Specific Objective: Promote waste management for improved air and water quality; and mitigation of greenhouse gases.</p> <p>Partner states shall:</p> <ul style="list-style-type: none"> • <i>(iii) Promote the generation of bio-energy, organic fertilizer, and other waste management by-products;</i> • <i>(vi) Promote investment in technological solutions for capturing methane as part of CDM projects that would result in carbon credits;</i> • <i>(viii) Promote adoption of resource efficient and cleaner production.</i>
<p>CCP, ch. 3, 3.3.3 Research and Observation</p>	<p>EAC Partner States shall strengthen climate change scientific research through monitoring, detection, attribution and prediction through, inter alia;</p> <ul style="list-style-type: none"> • <i>(iv) Support development of joint research programs on drought, floods, pests and disease resistant crops and livestock, and foster cooperation with regional organizations to facilitate transfer of research developments from other regions;</i> • <i>(v) Strengthen research and promote data and information exchange for all sectors impacted by climate change, including forests and wetlands in the EAC region;</i> • <i>(vi) Promote periodic climate change related research and exchange of information in conservation and sustainable use of wildlife;</i> • <i>(ix) Promote implementation of research findings and its linkages with policy formulation and practice research that promotes modern agriculture technology</i>

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
<p>CCP, ch. 3, 3.4.1</p> <p>Research and Observation – Cross Cutting Issues</p>	<p>Education, Training and Public Awareness</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Undertake public awareness on the importance of ecosystems, such as forests, wetlands and marine ecosystems in climate change mitigation and the well-being of the region's environment;</i> • <i>(ii) Create awareness on linkages between climate change and key socio-economic sectors, including health;</i> • <i>(iii) Support the development, integration and training of climate change adaptation and disaster risk reduction in educational institutions and curricula from lower to tertiary and higher education levels;</i> • <i>(iv) Support development of relevant training models within the EAC Partner States' training institutions that will address climate change challenges and opportunities from a more informed perspective and in a harmonized manner;</i> • <i>(v) Support the establishment/enhancement of climate change training institutions/programmes and centres of excellence and extension services for increased capacity of the region to address climate change, including the capacity to access and use of financial and technological resources available, regionally and internationally; and</i> • <i>(vi) Support training opportunities and institutions, including those related to negotiation skills, adaptation and mitigation science and technology, international climate change politics and international environmental governance.</i>
<p>CCP, ch. 3, 3.4.4</p> <p>Research and Observation – Cross Cutting Issues</p>	<p>Gender dimensions</p> <p>Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Integrate gender dimensions in assessing vulnerability, impacts and risks of climate change at local, national and regional levels;</i> • <i>(ii) Promote involvement of women in climate change monitoring, adaptation and decision-making processes; and</i> • <i>(iii) Promote social protection programmes for vulnerable communities, households and individuals including women, children, youth and others.</i>

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
<p>CCP, ch. 4, 4.2.2 Implementation and Resource Mobilization Plan</p>	<p>Technology Development and Transfer Partner States shall:</p> <ul style="list-style-type: none"> • <i>(i) Enhance technology development and transfer, including hard technological solutions such as drip irrigation, water harvesting, drought tolerant crop varieties, renewable energy technologies and building technologies; and soft technology such as knowledge, systems, procedures and best practices;</i> • <i>(ii) Address technology transfer barriers, including rules of trade tariffs, intellectual property rights (IPR) and technical trade barriers such as standards, eco-labeling; and</i> • <i>(iii) Enhance and support research and development capacity in East Africa to foster the development and local manufacture of cleaner production technologies to support climate change mitigation and adaptation.</i>
<p>ARDP, art. 4.5.3 Forestry</p>	<p>Objective: The main objective in forestry is to promote sustainable management, development and utilization of forest resources for environmental and socio-economic benefits.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Harmonize forestry policies and legislation</i> • <i>ii. Promote participation of local communities and the private sector in development, management and conservation of biodiversity;</i> • <i>iii. Promote joint efforts in research, extension and training;</i> • <i>iv. Promote agro forestry;</i> • <i>v. Promote proper management of existing forests; and</i> • <i>vi. Promote development and sustainable utilization of new forests.</i>
<p>ARDP, art. 4.8.3 Irrigation and Water Management</p>	<p>Objective: The overall objective is to increase agricultural production and productivity and to stimulate crop diversification (for high-value and high-quality products for domestic and export markets) and production forages.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Mobilize resources for efficient utilization of irrigation potential in the region;</i> • <i>ii. Promote private sector and community participation in the development of irrigation, water management and maintenance of irrigation infrastructures;</i> • <i>iii. Promote research and development in irrigation and water management technologies;</i> • <i>iv. Promote regional co-operation and exchange of technology and information;</i> • <i>vii. Promote utilization of simple irrigation technologies and systems</i>

Relevant policy	Excerpts from policy objectives: Climate change and agriculture
ARDP, art. 4.9.3 Natural Disasters	<p>Objective: The overall objectives are to increase agricultural production and productivity in disaster prone areas, mitigate the effect of natural disasters, and combat the threat of desertification.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Develop (a) regional mechanism for disaster management, information exchange and training;</i> • <i>ii. Develop and promote appropriate production technologies for disaster prone areas;</i> • <i>iii. Establish a comprehensive database and early warning system;</i> • <i>iv. Develop appropriate response systems including food reserves to handle disasters; and</i> • <i>v. Develop technologies that promote the slowing down of desertification.</i>
ARDP, art. 4.14.3 Land and Environment	<p>Objective: The overall objective is to promote sustainable management, development, utilization, improvement and protection of the environment and natural resources.</p> <p>The EAC will:</p> <ul style="list-style-type: none"> • <i>i. Harmonize land use, tenure, and environmental policies and legislation;</i> • <i>ii. Develop Geographical Information Systems (GIS) capacity within the region;</i> • <i>iii. Develop land use management systems; and</i> • <i>iv. Promote sustainable agricultural practices that are environmentally friendly.</i>

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