ReSAKSS
Regional Strategic Analysis and Knowledge Support System
by AKADEMIYA2063

AGRODEP
African Growth & Development Policy
modeling consortium
by AKADEMIYA2063

Africa Agriculture Trade Monitor 2023

Edited by Sunday Odjo, Fousseini Traoré, and Chahir Zaki

AKADEMIYA 2063

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

Editors

Sunday Odjo, Deputy Director, Operational Support, AKADEMIYA2063.
Fousseini Traoré, Senior Research Fellow, International Food Policy Research Institute (IFPRI).
Chahir Zaki, Professor of Economics (Junior Chair Professor), University of Orléans; Research Fellow, Economic Research Forum.

The Regional Strategic Analysis and Knowledge Support System (ReSAKSS)

Established in 2006 under the Comprehensive Africa Agriculture Development Programme (CAADP), the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) supports efforts to promote evidence- and outcome-based policy planning and implementation.In particular, ReSAKSS provides data and related analytical and knowledge products to facilitate CAADP benchmarking, review, and mutual learning processes. AKADEMIYA2063 leads the work of ReSAKSS in partnership with the African Union Commission, the African Union Development Agency-NEPAD (AUDA-NEPAD), and leading regional economic communities (RECs).

The African Growth and Development Policy Modeling Consortium (AGRODEP)

The African Growth and Development Policy Modeling Consortium (AGRODEP) aims to position African experts as leaders in the study of strategic development issues in Africa and the broader agricultural growth and policy debate. AGRODEP facilitates use of economic modeling tools, promotes access to data sources, provides training and research grants, and supports collaboration between African and international researchers.

DOI: https://doi.org/10.54067/9781737916475
ISBN: 9781737916475

The report is produced and published under the AGRODEP and ReSAKSS programs as a collaborative effort by AKADEMIYA2063 and IFPRI.

The report should be cited as:

Odjo, S., F. Traoré, and C. Zaki, eds. 2023. Africa Agriculture Trade Monitor 2023. Kigali and Washington, DC: AKADEMIYA2063 and International Food Policy Research Institute.

Contributors

Nora Aboushady, Assistant Professor of Economics, Cairo University; Senior Researcher, German Institute of Development and Sustainability | **Antoine Bouët,** Director, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) | **Julia Collins,** Senior Associate Scientist, AKADEMIYA2063 | **David Laborde,** Director, Agrifood Economics Division, Food and Agriculture Organization of the United Nations (FAO) | **Greenwell Matchaya,** Senior Researcher, ReSAKSS Coordinator for Eastern and Southern Africa, International Water Management Institute (IWMI) | **Nicodème Nimenya,** Lecturer and Researcher, University of Burundi | **Sunday Odjo,** Deputy Director, Operational Support, AKADEMIYA2063 | **Elsa Olivetti,** Research Assistant, International Food Policy Research Institute (IFPRI) | **Myriam Ramzy,** Assistant Professor of Economics at the Faculty of Economics and Political Science, Cairo University | **Leysa M. Sall,** Economist, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) | **Fousseini Traoré,** Senior Research Fellow, International Food Policy Research Institute (IFPRI) | **Chahir Zaki,** Professor of Economics (Junior Chair Professor), University of Orléans; Research Fellow, Economic Research Forum.

CONTENTS

List of Tables

List of Appendices

List of Figures

List of Boxes

ACRONYMS AND ABBREVIATIONS

AATM	Africa Agriculture Trade Monitor
ACF	African Cotton Foundation
AfCFTA	African Continental Free Trade Area
AMU	Arab Maghreb Union
BMZ	German Federal Ministry for Economic Cooperation and Development
BRICS	Brazil, Russia, India, China, and South Africa
CAN	calcium ammonium nitrate
CEFTA 2006	Central European Free Trade Agreement
CEMAC	Communauté Economique et Monétaire de l'Afrique Centrale (Economic and Monetary Community of Central Africa)
CEZ	Common Economic Zone
CFDT	Compagnie Française de Développement des Fibres Textiles
CIF	cost insurance freight
CmiA	Cotton Made in Africa
COMESA	Common Market for Eastern and Southern Africa
CVM	countervailing measures
DAP	di-ammonium phosphate
DRC	Democratic Republic of the Congo
DSM	dispute settlement mechanism
EAC	East African Community
EAEC	Eurasian Economic Community
EAEU	Eurasian Economic Union
EC	European Community
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of Western African States
EFTA	European Free Trade Association
ESA	East and Southern Africa
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEWSNET	Famine Early Warning Systems Network
FSNWG	Food Security and Nutrition Working Group

FOB	free on board
FTA	free trade agreement
GATS	General Agreement on Trade in Services
GCC	Gulf Cooperation Council
GDP	gross domestic product
GSTP	Global System of Trade Preferences
HS	Harmonized System
ICBT	informal cross-border trade
IFPRI	International Food Policy Research Institute
IPR	intellectual property rights
LAC	Latin America and the Caribbean
LDCs	least developed countries
LPI	Logistic Performance Index
MAcMap	Market Access Map
MERCOSUR	Southern Common Market
MSME	micro, small, and medium enterprises
NCD	noncommunicable disease
NTB	nontariff barrier
NTM	nontariff measure
PAFTA	Pan-Arab Free Trade Area
PTN	Protocol on Trade Negotiations
R&D	research and development
RAE	retinol activity equivalent
RCA	revealed comparative advantage
RDA	Recommended Dietary Allowance
REC	regional economic community
RIAPA	Rural Investment and Policy Analysis
RoO	rules of origin
RTA	regional trade agreement
SACU	South African Customs Union
SADC	South African Development Community
SME	small and medium enterprises

SPS	sanitary and phytosanitary
TBT	technical barriers to trade
TFTA	Tripartite Free Trade Area
TRIMS	trade-related investment measures
TRIPS	trade-related intellectual property rights
UBOS	Uganda Bureau of Statistics
UN Comtrade	United Nations Commodity Trade Statistics Database
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
USAID	United States Agency for International Development
USD	United States dollar
VAT	value-added tax
WAEMU	West African Economic and Monetary Union
WCA	West and Central Africa
WTO	World Trade Organization

ACKNOWLEDGMENTS

AKADEMIYA2063, the International Food Policy Research Institute (IFPRI), and the editors of this volume, Sunday Odjo, Fousseini Traoré, and Chahir Zaki, express their deepest appreciation to all those who provided support to the writing and production of *the 2023 Africa Agriculture Trade Monitor* and to all those whose work made this publication possible.

First, we would like to acknowledge with much appreciation the hard work of all the authors and their efforts to address several rounds of comments from external reviewers and editors. We are especially indebted to Julia Collins, who acted as the editorial coordinator for the volume, reviewing draft chapters and ensuring coordination among the editors, the team of authors, and external reviewers.

We are also much indebted to all those who contributed to the review process for the publication, including Lionel Cosnard, Cheickh Sadibou Fall, Giorgia Giovannetti, Trudi Hartzenberg, David Luke, Simon Mevel, Andrew Mold, Luca Salvatici, Jean Senahoun, John Ulimwengu, and Wilma Viviers. Moreover, this work would not have been possible without the financial support of the United States Agency for International Development (USAID) and the German Federal Ministry for Economic Cooperation and Development (BMZ).

Finally, we gratefully acknowledge the contributions of all those who worked tirelessly to ensure that this volume was produced on time and to the quality that AKADEMIYA2063 and IFPRI require, including among others Ibnou Ndiame for helping the coordination team, Tidiane Oumar Ba for visual design and production, Leysa Maty Sall for data preparation and statistical analysis, Pamela Stedman-Edwards for editorial support, and Layih Butake for communications and outreach support.

While the editors and authors are grateful to all those who submitted comments and feedback on the chapters, any errors and omissions remain their own responsibility.

FOREWORD

Africa is facing the impacts of multiple external shocks—most notably, the war in Ukraine and the COVID-19 pandemic, and a growing threat from climate change. According to the 2021 State of the Climate in Africa report, the rate of temperature rise across Africa reached 0.3°C per decade from 1991 through 2021, faster than the global average. Undoubtedly, this increases risks to agriculture, food security, and livelihoods. Africa and African populations depend heavily on agriculture, and climate change will clearly affect production, export potential, and thus economic growth and household welfare in the sector. However, trade policy can play a significant role in adapting to and mitigating the impact of climate change, and several developed country trade agreements include environmental provisions that aim to reduce challenges arising from climate change. African trade agreements still have a long way to go in including enforceable environmental provisions in their regional trade agreements, and especially in the African Continental Free Trade Area Agreement.

Against this background, *the 2023 Africa Agriculture Trade Monitor (AATM)* has three objectives. First, it provides a thorough and in-depth analysis of Africa's regional and continental trade in agriculture and selected value chains, using updated and accurate trade statistics developed for the AATM database. Second, it examines the impact of the Russia-Ukraine war on African countries, especially on agrifood systems and poverty. Third, at the regional level, it analyzes the evolution of intra- and extraregional trade flows and examines the trade policy and trade flows of one of the regional economic communities (RECs), namely the East African Community (EAC).

As in prior editions, this sixth edition of the AATM provides high-quality trade statistics using consistent indicators in order to monitor trends in Africa's participation in global trade as well as the status of intra-African trade. The report highlights three main findings. First, it provides rather good news that intra-African agricultural trade has increased significantly since the early 2000s, although as of 2021 this trade remains below the peak value of US$16.1 billion recorded in 2013. The trade share of processed agricultural products is significant and growing, reaching 46.3 percent of intra-African agricultural trade in the 2019–2021 period. Second, Africa's regional trade agreements do not have sufficient impact on its trade in agriculture. This may reflect the overall relative shallowness of most African trade agreements both at the continental and the global level (with their exclusive focus on tariff removal). Deeper trade agreements would stimulate increased trade. Vertical depth (transparency and enforceability) matters more than how many provisions are included (horizontal depth) to make agreements effective. Third, among the RECs examined, the EAC has the second highest ratio of agriculture GDP to total GDP, as well as the highest trade introversion index value, indicating a high intraregional trade intensity. The higher intraregional trade flows are explained by customs duties that are zero on intraregional flows for almost all countries, but relatively high on extraregional trade flows. In addition, the logistic performance (clearance time, quality of infrastructure, and customs efficiency) in the EAC has improved relative to most other African countries, although it is still below the world average.

The report also examines a number of special topics. As in prior years, we focus on a specific value chain. The 2023 AATM analyzes the cotton value chain and finds that African countries are mainly competitive in unprocessed products. Only Egypt reveals some comparative advantage in manufactured cotton products. To allow African countries to expand into downstream segments of the cotton value chain (semi-processed and processed products), it will be essential to address both structural and cyclical challenges that affect African cotton producers.

Finally, the significant shock caused by the Russia-Ukraine war has driven substantial price increases and supply disruptions for fertilizers and food, particularly wheat and vegetable oils. In addition, in a world still recovering from the COVID-19 pandemic, climatic and geopolitical shocks have put incredible pressure on global markets, countries, and households, especially with the "beggar-thy-neighbor" impact of trade restriction measures put in place by major food and fertilizer exporters in response to the shocks.

The next issue of the AATM will analyze the impact of climate change on trade in agriculture in Africa and, to continue our examination of individual RECs, the Community of Sahel–Saharan States (CEN–SAD) or the Economic Community of West African States (ECOWAS) may be featured in 2024.

Ousmane Badiane
Executive Chairperson
AKADEMIYA2063

Johan Swinnen
Managing Director, Systems Transformation
CGIAR
Director General
International Food Policy Research Institute

EXECUTIVE SUMMARY

The 2023 Africa Agriculture Trade Monitor (AATM) analyzes continental and regional trends in African agricultural trade flows and policies, with a special focus on the East African Community (EAC), the cotton value chain, and the impact of the Russia-Ukraine war on African countries. The major findings from the report's six chapters are summarized below.

Africa is facing increasing threats at several levels. In addition to the COVID-19 pandemic, the war in Ukraine as well as other conflicts and geopolitical tensions, climatic shocks are more challenging than ever. Climate change is becoming more evident as the rate of temperature rise across Africa reached 0.3°C per decade from 1991 to 2021, which is faster than the global average (0.2°C per decade). As Africa is heavily dependent on agriculture, climate change will affect agricultural production, export potential, and thus economic growth, and household welfare. Serious actions must be taken by African countries at the national, regional, and continental levels (especially through the African Continental Free Trade Area Agreement) to make trade flows sustainable and trade policies more environment-friendly so as to reduce the negative impact of trade on climate and the enviroment. These issues, along with a summary of the report, are presented in Chapter 1.

Most of Africa's regional trade agreements are "shallow," with a limited impact on trade in agricultural products. The literature distinguishes between shallow agreements (that focus on tariff reductions only) and deep ones (that go beyond tariff reductions). Deeper trade agreements—characterized by horizontal depth (measured by the number of provisions that are included in trade agreements) and vertical depth (which refers to the legal enforceability of such provisions)—are more likely to affect trade. Chapter 2 examines the impact of the depth of agreements on trade in agricultural products and finds that the impact of Africa's regional trade agreements on this trade is limited. This may reflect the overall relative shallowness of most African agreements both at the continental and the global levels (with an exclusive focus on tariff removal). Deepening trade agreements is a key issue, with vertical depth being more important than horizontal depth to make the agreements effectively implementable and to improve their enforceability. Finally, inclusion of provisions on nontariff measures (NTMs) is important, as it is estimated to increase exports of agricultural products by between 20 percent (for technical barriers to trade) and 26 percent (for sanitary and phytosanitary measures), showing that the impact of these provisions in raising demand, through increased confidence, for example, is more important than the increase in costs entailed in compliance with more standards.

Intra-African agricultural trade has increased significantly since the early 2000s, with an increasing share of processed products. Chapter 3 analyzes intra-African trade with a focus on the nutritional content of trade flows. Intra-African trade has increased since the 2000s, but has stabilized in the current challenging international environment and, at US$14.9 billion in 2021, remains below its peak value of US$16.1 billion recorded in 2013. In terms of Africa's trade partners, around 14 percent of Africa's total agricultural imports are sourced from within the continent, and 20 percent of total agricultural exports are destined to the continental market. Among the regional economic communities (RECs), SADC and COMESA dominate intra-African agricultural trade at all product processing levels. At the product level, the trade share of processed products reached 46.3 percent of intra-African agricultural trade in the 2019–2021 period. The top processed agricultural product traded within the continent is pure sucrose (a highly processed product accounting for 4 percent of intra-African agricultural trade), followed by palm oil, cigarettes, and other food preparations. Finally, when trade flows are converted into their content in calories, proteins, fats, and key micronutrients, we find that intra-African trade plays a relatively smaller role in meeting Africa's nutrient needs. However,

intra-African trade is an important source of vitamin A and vitamin B12, particularly for SADC and EAC countries.

The cotton value chain is primarily concentrated in unprocessed cotton and faces several challenges. Chapter 4 analyzes Africa's cotton value chain, including levels of processing and trade patterns. African countries are mainly competitive in unprocessed cotton products, with only Egypt revealing some comparative advantage in manufactured cotton products. The limitations in processing are due in part to some historical issues, namely cost inefficiencies and political interference in the management of government-controlled cotton companies of the early independence decades, which led to financial difficulties and sectoral liberalization reforms in the 1990s. Africa's global exports of cotton products decreased by 12 percent between the 2006–2010 period and 2017–2021 period, while its global imports increased by 37 percent. In addition, this value chain faces several challenges including a lack of R&D, low labor productivity (given the high share of informal and child labor), water stress (as cotton is water intensive), and tariff escalation in Africa's trade partners (which leads African countries to export raw fibers and import final goods such as textiles and clothing). Addressing these challenges is crucial to allow African countries to move into downstream segments of the cotton value chain, namely semi-processed and processed products.

The war in Ukraine had a significant impact on Africa, especially through major disruptions in fertilizers and food trade. The Russia-Ukraine war, analyzed in Chapter 5, has brought an additional challenge to already turbulent global markets since its onset in 2022, especially for several African countries that are heavy importers of wheat and fertilizers from the warring countries. The war led to substantial increases in prices and important disruptions in supply of fertilizers and food, particularly wheat and vegetable oils, adding to existing pressure on global markets, countries, and households. Unfortunately, these effects have been amplified by trade restriction measures put in place by major food and fertilizer exporters. These "beggar-thy-neighbor policies" reduce supply and increase prices and volatility. Several African countries are thus highly exposed to the fertilizer and food market disruptions, which raises concerns about future crop years and the food security situation in the continent, which is already under stress due to the COVID-19 pandemic. Although food and fertilizer prices have begun to decline, they are still above their pre-pandemic levels.

The EAC, which has a high share of agriculture GDP in total GDP among the RECs, trades more at the intraregional level than outside the region. As every year, Chapter 6 is dedicated to the analysis of a specific REC; this year we analyze the EAC. Among the five RECs examined in the chapter, this region has the highest introversion index, meaning its share of intraregional trade is comparatively high. This is primarily due to customs duties that are zero on intraregional flows (except in the Democratic Republic of the Congo), but relatively high on extraregional trade flows. In addition, the logistic performance (clearance time, quality of infrastructure, and customs efficiency) in the EAC (except Burundi) has improved relative to other African countries, but is still below the world's average. However, EAC trade continues to be shaped by colonial-era policies, as the region still primarily exports the same products that dominated during the colonial era, including unprocessed coffee, tea, cocoa beans, and unprocessed cotton. In addition, EAC countries import an enormous volume of products that are vital for food security, including wheat, rice, maize, vegetable oils, and sugar, as well as food preparations and non-alcoholic beverages. Finally, informal trade in EAC remains important, despite declining in this REC as in most African regions.

CHAPTER
ONE

Overview and Recent Challenges

Sunday Odjo, Fousseini Traoré,
and Chahir Zaki

Introduction and Background

This is the sixth Africa Agriculture Trade Monitor (AATM), an annual flagship publication of the International Food Policy Research Institute (IFPRI) and AKADEMIYA2063. The AATM provides an overview of trade in agriculture in Africa, including analysis of short- and long-term trends and drivers behind Africa's global trade, intra-African trade, and trade within Africa's regional economic communities. The AATM is supported by the United States Agency for International Development (USAID) and the German Federal Ministry for Economic Cooperation and Development (BMZ). The six chapters of this 2023 AATM report are as follows.

This first chapter provides an overview of the importance and complexity of analyzing the climate change and trade nexus. After discussing why such an analysis matters for African policymakers, it briefly exposes the reverse causality between climate change and trade (that is, how trade affects climate) and then reviews various ways through which climate change is likely to affect trade. The section concludes with a discussion of how trade policy can help Africa mitigate and adapt to climate change. This chapter also includes a section on the data treatments designed to build and update the AATM database.

Chapter 2 provides a comprehensive analysis of African regional trade agreements (RTAs) and their impact on Africa's trade in agriculture. It starts with an overview of the evolution of RTAs established among African countries as well as RTAs involving both African and non-African countries and regions. The chapter then compares the depth of those African RTAs with that of trade agreements involving non-African emerging or developing countries, with a focus on the number of provisions included in each agreement (horizontal depth) as well as the number of legally enforceable provisions and the number of provisions subject to dispute settlement (vertical depth). Using a gravity-type analysis, the chapter also empirically examines the impact of the different types of RTA provisions on African agricultural trade. It concludes with a discussion of policy implications for the implementation of the African Continental Free Trade Area (AfCFTA) Agreement.

Chapter 3 focuses on the nutritional content of Africa's imports of agricultural products. After a review of emerging trends in intra-African agricultural trade by product processing level, the chapter investigates the composition of Africa's imports in terms of calories, proteins, fats, and key micronutrients, contrasting global and intracontinental import sources, and comparing nutrient content of trade flows with the requirements for a healthy diet. A discussion of food safety and broader sanitary and phytosanitary concerns follows before the chapter concludes.

Chapter 4 analyzes the competitiveness of cotton value chain in African countries compared with their top non-African competitors. It first reviews the history of cotton trade and production in Africa, and then explores the main trends in Africa's trade in cotton products by their processing level. The chapter then investigates the cotton export competitiveness of African countries, using a new revealed comparative advantage index that relies on an econometric approach. The chapter concludes by highlighting opportunities and challenges facing trade in cotton products and offering policy recommendations.

The likely impact of the Russia-Ukraine war on Africa's agricultural trade and food systems is explored in Chapter 5. The chapter starts with a discussion of the important role of Russia and Ukraine in world food and fertilizer markets, along with the evolution of key commodity prices and the factors affecting those prices. This is followed by an analysis of Africa's dependence on world food and fertilizer markets, with a focus on the role of exports from Russia, Ukraine, and Belarus. The chapter then provides a review of research findings on the current conflict's impacts on agrifood systems and poverty in Africa. The policy responses put in place in Africa

to cushion the shocks are also reviewed and recommendations are made for mitigating and adapting to future crises.

Agricultural trade integration in the East African Community (EAC) is the focus of Chapter 6. After an overview of the origins of the EAC agreement and its main integration achievements, the chapter offers a comparison of EAC and other regional economic communities with respect to agricultural trade performance, regional integration, and factors limiting the free movement of goods. It then assesses the magnitude of formal (registered) and informal cross-border agricultural trade within the EAC area. The chapter also considers factors affecting trade integration and the role of tariff and nontariff measures, logistics, and exchange rates before offering conclusions.

Trade in Agriculture and Climate Change in Africa: A Pressing Issue

The Intergovernmental Panel on Climate Change (IPCC) shows that an increase in global temperature of 1.5°C above pre-industrial levels will increase risks to agriculture, trade patterns, food security, and livelihoods. More specifically, the relationship between climate change and trade is complicated given its two-way nature. This is why this nexus has been the subject of important policy debates in recent years (Aaditya et al. 2020). For Africa, the impact of climate change on trade is of particular importance, because its comparative advantage in agricultural goods is expected to be significantly affected; for example, increased frequency of extreme climatic events such as droughts and floods brought on by climate change will have a negative impact on the agriculture sector (Thurlow et al. 2012) and thus on agrifood trade. Notably, the Africa Adaptation Gap Report (UNEP 2013) finds that climate change could lead to a 20 percent decrease in total crop yields in sub-Saharan Africa by 2070, which could affect its agricultural production, export potential, economic growth, and household welfare.

Why does climate change matter for trade?

The climate change and trade nexus is complex. While it is well recognized that climate change affects trade, the opposite is equally true—trade contributes to climate change, and can play a significant role in adapting to and mitigating climate change effects. Since trade involves the production and transportation of goods across borders, it contributes to carbon emissions, with some estimates showing that almost one-quarter of global emissions can be linked to international trade flows (Brenton and Chemutai 2021). While both aspects of the trade–climate change nexus are important, we focus here on the impact that climate change is likely to have on trade.

First, climate change can affect trade in agricultural goods through its impact on production and productivity (Mendelsohn 2009). According to estimates from the Food and Agriculture Organization of the United Nations (FAO), if climate change challenges are not addressed, the production of major cereal crops will decline significantly by the year 2100 (maize by 20–45 percent, wheat by 5–50 percent, and rice by 20–30 percent) (Arora 2019). In the same vein, several studies show that climate change reduces agricultural productivity, especially in the long run.[1] In Cameroon, for example, a survey of 800 farms shows that net revenues fall as precipitation decreases or temperatures increase (Molua and Lambi 2007). Thus, if climate change disrupts production, exports of countries that have a comparative advantage in agriculture may be severely affected.

Second, climate change increases uncertainty and the ability to predict weather events such as floods and dry spells, which makes it difficult for farmers to plan their production and trade

1 See Zaied and Cheikh (2015) for Tunisia; Chandio et al. (2020) for China; and Abbas (2020) for Pakistan).

activities, especially in rainfed activities and farming systems (De Pinto et al. 2019). In addition, climate change will amplify water stress problems from which Africa is already suffering. For instance, in Zambia, climate change will lead to a 13 percent reduction in water availability by 2050 (Hamududu and Ngoma 2020).

The third, and most important, impact to note is that climate-induced yield changes will lead to shifts in comparative advantages between countries. Indeed, climate change effects on yields will not be uniform across the world. Some countries in northern latitudes are expected to experience gains, while the vast majority of countries in tropical latitudes (mostly developing countries) will suffer decreases in average yields. However, effects will be uneven across regions and crops. While maize, rice, and wheat yields are all likely to decrease in sub-Saharan Africa, maize yields are expected to increase in Asia and Latin America and rice yields to increase in Europe (Gouel and Laborde 2021). These differential impacts on crop productivity correspond to changes in countries' comparative advantages that will affect trade flows. Within Africa, the impacts will also be uneven. The overall (weighted average) impact on productivity due to changes in crop yields ranges from −0.54 percent in South Africa to −38 percent in Malawi (Costinot, Donaldson, and Smith 2016). Estimates from the literature show that climate-induced changes in comparative advantages (due to higher temperatures and increased precipitation) will significantly affect exports of low- and middle-income countries. The elasticities of trade flows to temperature are particularly high: a 1°C increase in temperature is likely to lead to a 23 percent fall in the agricultural exports of lower-middle-income countries and a drop of 39 percent in exports of low-income countries (Barua and Valenzuela 2018). These figures are likely underestimated, since they do not account for the impact of climate change on agricultural labor productivity. Indeed, labor productivity is projected to decline in the tropics due to rising temperatures. If these effects are considered, the estimated cost of climate change will be higher (Hertel and de Lima 2020). In addition, Bozzola et al. (2023) find that greater differences in temperatures between trading partners are beneficial for developed countries' exports but detrimental for developing countries' exports. Thus, the effects of climate change might call for a change in cultivated crops and livestock, meaning that this pressure from climate change can help emerging economies diversify their export structure and thus change their comparative advantage (WTO 2021).

Finally, climate change can also affect food security. The World Trade Organization (WTO 2021) argues that it can affect all four pillars of food security: (1) food availability—due to the decrease in yields; (2) food access—due to higher prices of food products; (3) food utilization—due to an increase in the prevalence of microorganisms and toxins; and (4) food stability—due to more frequent extreme events such as floods and droughts. Vulnerable social groups, including women and the poor as well as micro, small, and medium enterprises (MSMEs), will experience the greatest impacts (Hallegatte et al. 2016; Brenton and Chermutai 2021). Clearly, given the large share of vulnerable people and MSMEs in Africa, these problems are serious for African countries.

Can trade play a positive role?

Trade can play a role in adapting to and mitigating the impact of climate change, as recent literature has highlighted. For example, Gouel and Laborde (2021), in their analysis of the role of trade in alleviating the consequences of climate change, find that trade adjustments can reduce welfare losses resulting from climate change. They find that without trade adjustments (that is, if trade adjustments are prevented and bilateral import shares must remain constant), welfare losses due to climate change would increase by 30 percent. Therefore, allowing and facilitating trade adjustment will be key.

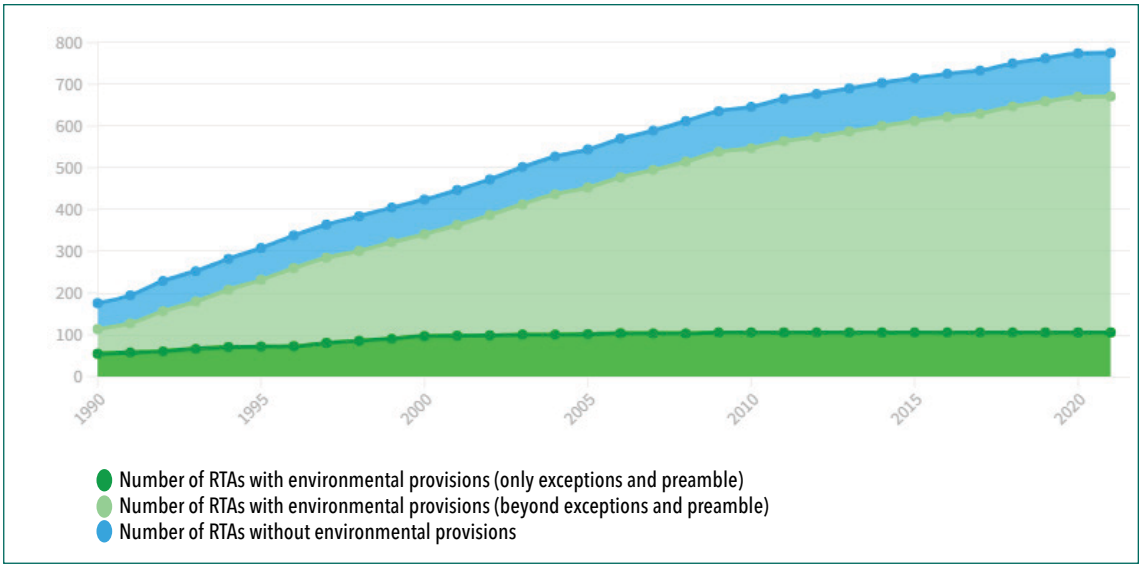
One consideration often omitted in the trade–climate change debate is the potential of trade to slow climate change through an intelligent use of countries' comparative advantages. When trade shifts production from environmental resource-scarce countries to resource-abundant areas, the environmental impact of economic activities is often mitigated. For example, studies have shown that bilateral trade for some products is determined not only by economic variables but also by water endowments and the level of pressure on water resources (Fracasso 2014). International trade can therefore save water globally or regionally if, ceteris paribus, water-intensive products are exported from an area of high water productivity (that is, products with lower virtual-water content) or with high water endowments to an area with lower water productivity or low water endowments. Therefore, trade is likely to lead to a more efficient use of water resources across the world.

What about trade policy?

Trade policy can play an important role in addressing climate change through the inclusion of environmental provisions in RTAs. The literature on trade policy distinguishes between shallow and deep agreements. While the former refers to agreements that focus mainly on tariff removal, the latter include additional policy issues such as labor and environmental provisions. The evolution from shallow toward deep trade agreements includes greater horizontal depth (number of policy areas covered) and vertical depth (number of commitments and provisions for transparency and enforcement mechanisms).

Incorporation of environmental provisions into RTAs has increased substantially, especially in recent decades. Of the 775 RTAs established between 1947 and 2021, 671 (87 percent) included at least one type of environmental provision as a part of the agreement (that is, beyond the exceptions and the preamble) (Figure 1.1). The average number of environmental provisions included in an agreement increased from around 8 provisions in the 1990s to nearly 19 provisions in the 2000s, and to over 44 provisions in the 2010s. Despite this increase, Aaditya et al. (2020) argue that commitments for several other policy areas, including customs and trade facilitation, investment, and movement of capital, have seen a steadier increase.

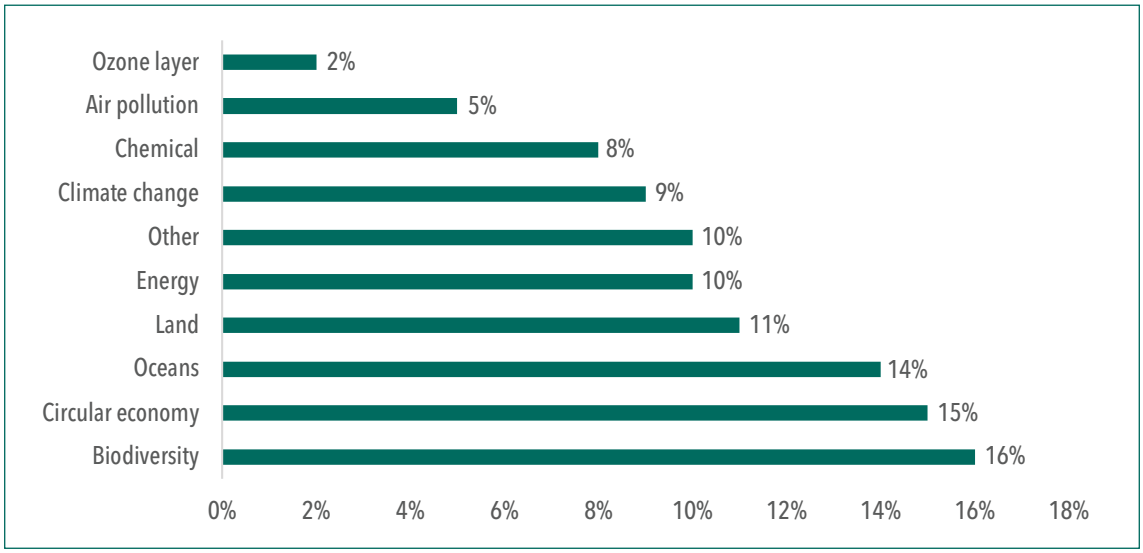
Figure 1.1 Cumulative number of regional trade agreements with and without environmental provisions, by year of signature, 1990–2021



Source: OECD (2023).

Environmental provisions include a large range of policy dimensions such as multilateral environmental agreements, upholding environmental law, environmental cooperation, specific environmental issues, implementation mechanisms, public participation, dispute settlement, and impact assessment, or are just mentioned in the preamble of the agreement. Figure 1.2 shows that the specific environmental issues are diverse, with biodiversity, circular economy, oceans, and land having the largest shares and climate change provisions representing only 9 percent of these specific provisions.

Figure 1.2 Breakdown of specific environmental issues in RTAs as of 2021



Source: Authors' elaboration based on OECD (2023).

A closer look into intra-African regional trade agreements (Table 1.1) shows that COMESA, ECOWAS, EAC, and CEMAC[2] include environmental provisions; however, these are not legally enforceable, which reduces their impact. The other intra-African agreements do not include such provisions. In contrast, at the extraregional level, most of the bilateral agreements between the European Union and African countries (Algeria, Egypt, Morocco, South Africa, Tunisia, and SADC[3] countries) include some environmental provisions (though not legally enforceable), while those with Cameroon and Côte d'Ivoire do not. Only the free trade agreement between Morocco and the United States includes legally enforceable environmental provisions. As for the AfCFTA, the protocols on trade in goods and trade in services include minimal reference to environmental issues, whereas the protocol on investment (that is part of Phase II of the AfCFTA negotiations) includes more provisions related to the environment and climate change. For example, chapter 4 addresses sustainable development, especially articles 8 and 24. In addition, articles 25 (on minimum standards on the environment, labor, and consumer protection), article 26 (on investment and climate change), and article 34 (on environmental protection) address environmental challenges more explicitly.

Table 1.1 Environmental provisions in intra- and extraregional African trade agreements

Intra-African		Extra-African		
With environmental provisions	Without environmental provisions	With environmental provisions	Without environmental provisions	Enforcement
• COMESA • ECOWAS • EAC • CEMAC	• SACU • SADC • WAEMU • SADC–Accession-of Seychelles	• EC–Algeria • EC-Egypt • EC–Morocco • EC–South Africa • EC–Tunisia • US–Morocco • EU–Eastern and Southern Africa States Interim EPA • EU–SADC	• EC–Cameroon • EC–Côte d'Ivoire • PAFTA • Agadir Agreement • Global System of Trade Preferences among developing countries (GSTP) • EFTA–Egypt • EFTA–Morocco • EFTA–SACU • EFTA–Tunisia • Türkiye–Morocco • Türkiye –Tunisia • EU–Ghana • MERCOSUR–Egypt • SAFTA	• US–Morocco

Source: Authors' elaboration using the World Bank's Deep Trade Agreements database.
Note: EAC = East African Community; COMESA = Common Market for Eastern and Southern Africa); ECOWAS = Economic Community of West African States; CEMAC = Central African Economic and Monetary Community; SACU = Southern African Customs Union; SAFTA = South Asian Free Trade Area; SADC = Southern Africa Development Community; EC = European Community; EU = European Union: EFTA = European Free Trade Association; PAFTA = Pan-Arab Free Trade Area; MERCOSUR = Southern Common Market.

2 COMESA (Common Market for Eastern and Southern Africa); ECOWAS (Economic Community of West African States); CEMAC (Central African Economic and Monetary Community).
3 SADC (Southern Africa Development Community).

To address this gap, the AfCFTA should add both a new institutional arrangement and a protocol focused on climate change and environment, and guarantee the enforceability of these provisions (Briel 2023). In fact, the literature shows that such provisions are generally associated with better environmental outcomes and can thus contribute to curbing the negative effects of climate change. For instance, Brandi et al. (2020) show that environmental provisions in RTAs can reduce the share of "dirty" exports and increase the share of "green" exports from developing countries, specifically from those with stringent environmental regulations. They argue that a developing country with stricter enforcement mechanisms might have greater flexibility in adapting its export structure in accordance with environmental provisions in preferential trade agreements. For example, Martínez-Zarzoso (2018) finds that sulfur dioxide and nitrogen oxide emissions decreased slightly more in countries that have RTAs with environmental provisions than in those without environmental provisions. However, the effect on air quality was not statistically significant.

Issues Concerning Data and Methodology

To monitor trade in agriculture, this AATM report endeavors to use reliable trade statistics. High-quality statistics are fundamental for good policy recommendations. Quality data are particularly needed for agricultural trade in Africa, where official trade statistics are often partial and inaccurate and do not include informal trade. For this reason, the establishment of a high-quality trade database was considered essential for the preparation of the AATM. Here we discuss issues related to the statistical approach we have adopted to ensure rigorous analysis.

Like the 2022 AATM report, the 2023 release is based on an original dataset constructed to provide better statistics on global and African trade. This analytical database is based on the United Nations Commodity Trade Statistics Database (UN Comtrade). Raw trade data are processed to provide an accurate estimate of formal cross-border trade in Africa (no estimate of informal trade is included in this 2023 edition of the dataset). However, informal trade is considered in the regional chapter (Chapter 6) devoted to the EAC.

In the first step, the data are harmonized and cleaned. Trade flows of less than US$1,000 at the product and bilateral levels are discarded since they are associated with significant noise in quantity estimates. Because countries report in different Harmonized System (HS) nomenclatures, all data are converted to the HS 2012.

The second step aims to reconstruct unique trade flows in the presence of discrepancies in mirror trade flows, that is, the import and export declarations of the same trade transaction. Rather than averaging the two declarations, a series of checks aimed at identifying the most reliable declaration is conducted. First, export and import unit values for each trade flow (trade value divided by the corresponding trade quantity) are computed; outliers are identified, and their associated trade flows discarded. An observation is considered an outlier if the absolute deviation is greater than three times the mean absolute deviation (the mean absolute deviation being the average distance between each data point and the mean). This gives us a sense of the variability in the dataset. The remaining trade flows are selected based first on the importer declaration—these are generally more reliable because collection of customs duties requires that imports be monitored carefully. Then, if an importer declaration of a trade flow is not available or is previously discarded, the exporter declaration is used.

Finally, the trade flows are all expressed in CIF (cost insurance freight) value. When the exporter's FOB (free on board) declaration has been used, a CIF/FOB correction is applied. The estimates of the CIF/FOB ratios used to make this correction were obtained using a gravity

equation including distance, contiguity, common official language, and colonial relationship as explanatory variables. When estimating the gravity equation, trade values were weighted by quantities using the gap between the reported mirror quantities to give more importance to trade flows similarly reported by both partners. From the gravity equations, HS2-level estimates of the CIF/FOB ratio are derived and applied to export declarations.

The annual AATM aims to provide a thorough analysis of Africa's trade in agriculture. Over the years, the AATM database has gained in accuracy and the length of time covered. As highlighted in preceding editions of this report, the measurement and integration of informal trade data in the AATM database remains a challenge that must be addressed to obtain a complete picture of intra-African trade flows. In addition, a more detailed analysis will be needed of the impact of climate change on trade in agriculture, growth, and welfare for the diverse African economies.

References

Aaditya, M., N. Rocha, and M. Ruta. 2020. *Handbook of Deep Trade Agreements*. Washington, DC: World Bank.

Abbas, S. 2020. "Climate Change and Cotton Production: An Empirical Investigation of Pakistan." *Environmental Science and Pollution Research* 27 (23): 29580–29588.

Barua, S., and E. Valenzuela. 2018. "Climate Change Impacts on Global Agricultural Trade Patterns: Evidence from the Past 50 Years." Proceedings of the *Sixth International Conference on Sustainable Development 2018*, Columbia University, New York, September 26–28.

Ben Zaied, Y., and N. Ben Cheikh. 2015. "Long-Run versus Short-Run Analysis of Climate Change Impacts on Agricultural Crops." *Environmental Modeling & Assessment* 20: 259–271.

Brenton, P., and V. Chemutai. 2021. *The Trade and Climate Change Nexus: The Urgency and Opportunities for Developing Countries*. Washington, DC: World Bank.

Briel, G. 2023. "Trade, Climate and Sustainability in the AfCFTA." Tralac Trade Report No. S23TR03/2023. Tralac, Stellenbosch, South Africa.

Bozzola, M., E. Lamonaca, and F.G. Santeramo. 2023. "Impacts of Climate Change on Global Agri-food Trade." Robert Schuman Centre for Advanced Studies Research Paper No. 2023-40. Robert Schuman Centre for Advanced Studies Global Governance Programme, Florence, Italy.

Chandio, A.A., Y. Jiang, A. Rehman, and A. Rauf. 2020. "Short and Long-Run Impacts of Climate Change on Agriculture: An Empirical Evidence from China." *International Journal of Climate Change Strategies and Management* 12 (2): 201–221.

Costinot, A., D. Donaldson, and C. Smith. 2016. "Evolving Comparative Advantage and the Impact of Climate Change in Agricultural Markets: Evidence from 1.7 Million Fields around the World." *Journal of Political Economy* 124 (1): 205–248.

De Pinto, A., V.H. Smith, and R.D. Robertson. 2019. "The Role of Risk in the Context of Climate Change, Land Use Choices and Crop Production: Evidence from Zambia." *Climate Research* 79 (1): 39–53.

Fernandes, A., N. Rocha, and M. Ruta. 2021. *The Economics of Deep Trade Agreements*. Washington, DC: World Bank.

Fracasso, A. 2014. "A Gravity Model of Virtual Water Trade." MPRA Paper No. 54124. School of International Studies, University of Trento, Trento, Italy.

Gouel, C., and D. Laborde. 2021. "The Crucial Role of Domestic and International Market-Mediated Adaptation to Climate Change." *Journal of Environmental Economics and Management* 106: 102408.

Hamududu, B.H., and H. Ngoma. 2020. "Impacts of Climate Change on Water Resources Availability in Zambia: Implications for Irrigation Development." *Environment, Development and Sustainability* 22 (4): 2817–2838.

Hertel, T.W., and C.Z. de Lima. 2020. "Viewpoint: Climate Impacts on Agriculture: Searching for Keys under the Streetlight." *Food Policy* 95 (August): 101954.

IPCC (Intergovernmental Panel on Climate Change). 2018. "Summary for Policymakers." In *Global Warming of 1.5°C: An IPCC Special Report*, eds. V. Masson-Delmotte, P. Zhai, H-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, et al., 1–24. Geneva.

Martínez-Zarzoso, I. 2018. "Assessing the Effectiveness of Environmental Provisions in Regional Trade Agreements: An Empirical Analysis." OECD Trade and Environment Working Papers No. 2018/02. OECD Publishing, Paris.

Molua, E.L., and C.M. Lambi. 2007. "The Economic Impact of Climate Change on Agriculture in Cameroon." World Bank Policy Research Working Paper No. 4364. World Bank, Washington, DC.

Mendelsohn, R. 2009. "The Impact of Climate Change on Agriculture in Developing Countries." *Journal of Natural Resources Policy Research* 1 (1): 5–19.

OECD (Organisation for Economic Co-operation and Development). 2023. *OECD Work on Regional Trade Agreements and the Environment*. Paris.

Ozdemir, D. 2022. "The Impact of Climate Change on Agricultural Productivity in Asian Countries: A Heterogeneous Panel Data Approach." *Environmental Science and Pollution Research* 29: 8205–8217.

Thurlow, J., T. Zhu, and X. Diao. 2012. "Current Climate Variability and Future Climate Change: Estimated Growth and Poverty Impacts for Zambia." *Review of Development Economics* 16 (3): 394–411.

UNEP (United Nations Environment Programme). 2013. *Africa's Adaptation Gap: Climate-Change Impacts, Adaptation Challenges and Costs for Africa*. Nairobi.

WTO (World Trade Organization). 2021. *Climate Change Adaptation and Africa: The Role of Trade in Building Agricultural Resilience***.** Trade and Climate Change Information Brief No. 5. Geneva.

CHAPTER
TWO

Which Agreements Boost Agricultural Trade in Africa?

Nora Aboushady, Myriam Ramzy,
and Chahir Zaki

Introduction

One of the main features of today's global trade system is the proliferation of regional trade agreements (RTAs).[1] Over the past four decades, the number of agreements increased from just 15 in 1980 to 583 in 2023 (WTO 2023). Most of the 583 agreements are free trade agreements (FTAs) (317), followed by economic integration agreements (190), partial scope agreements (27), and customs unions[2] (18).[3] The proliferation of RTAs in recent years has been coupled with broader and deeper coverage under these agreements. Broader coverage increasingly includes more policy areas that may be trade-related (tariffs and nontariff measures) or non-trade-related (behind-the-border policies, intellectual property rights, movement of capital and people, competition policy, and others). In this regard, the scope of RTAs has been expanded by WTO members and signatories of RTAs from just 8 policy areas in the 1950s to 17 policy areas today. Deeper agreements include an increasing number of commitments within each policy area (Fernandes et al. 2021). They are also increasingly accompanied by legal requirements, such as stronger transparency and enforcement mechanisms (Abman et al. 2021, Fernandes et al. 2021). Thus, RTAs are increasingly being converted to deep trade agreements.

Of the 583 RTAs in force today, African countries are party to 45 agreements, including 7 RTAs that are operational under the different African Regional Economic Communities (RECs). The other RTAs that involve African countries are characterized by the predominant presence of Europe as one of Africa's major trade partners. Several African countries are also party to international agreements involving developing and emerging countries, such as the Global System of Trade Preferences (GSTP) and the Protocol on Trade Negotiations (PTN).

This chapter assesses the role of RTAs in boosting agricultural trade in Africa. Our analysis extends beyond estimating the overall impact of agreements on African trade to assess the relative importance of the detailed agreements' provisions, including both broader and deeper coverage, in boosting agricultural trade. Across the chapter, we refer to horizontal depth as the larger number of provisions that are included in trade agreements, while vertical depth refers to the legal enforceability of such provisions (Hofmann et al. 2017).

Accounting for the role of specific provisions is critical for several reasons. First, over the past decades, African countries concluded a substantial number of intra-African trade agreements as well as agreements with non-African countries. This proliferation and deepening of agreements makes it more complex (yet highly relevant) to assess their impact on trade. Second, it is necessary to distinguish between provisions in policy areas that are included in the agreements under the World Trade Organization (referred to as WTO-plus areas) and those provisions in new policy areas that are not included under the WTO (referred to as WTO-X areas) to assess their impact on trade, even if they are not clearly trade-related. In the case of trade in agricultural products, nearly all recently signed agreements include provisions on tariff liberalization and elimination of nontariff measures (NTMs), while at least 80 percent include provisions related to trade facilitation, customs, and export taxes. More than 60 percent include provisions related to anti-dumping and countervailing duties and more than half include provisions related to subsidies, technical barriers to trade (TBTs), sanitary and phytosanitary measures (SPS), state-owned enterprises, public procurement, and services. All of these provisions can be classified as WTO-plus provisions. At the same time, more than 60 percent of the agreements have provisions related to competition policy and around 20 percent include

1 The World Trade Organization (WTO) defines an RTA as any reciprocal trade agreement between two or more partners, not necessarily belonging to the same region.
2 The WTO defines a customs union as an arrangement between countries to apply a common external tariff.
3 WTO Regional Trade Agreements database, https://rtais.wto.org/UI/publicsaummarytable.aspx

provisions related to environmental laws and labor market regulations, all considered WTO-X areas (Breinlich et al. 2021). Third, the degree of legal enforceability of provisions and the presence of a dispute settlement mechanism are likely to determine the effectiveness of the agreement in boosting trade through trade creation rather than just trade diversion. Finally, at the policy level, understanding the details of these agreements and their impact on trade enhancement is important with regard to the African Continental Free Trade Area (AfCFTA). The recently signed agreement including 54 African states may fail to boost intra-African trade if it has limited policy coverage and shallow commitments in terms of legal enforcement and dispute settlement. Thus, analyzing the role of detailed provisions can help us draw lessons from Africa's current engagements and apply these to the future integration of the continent.

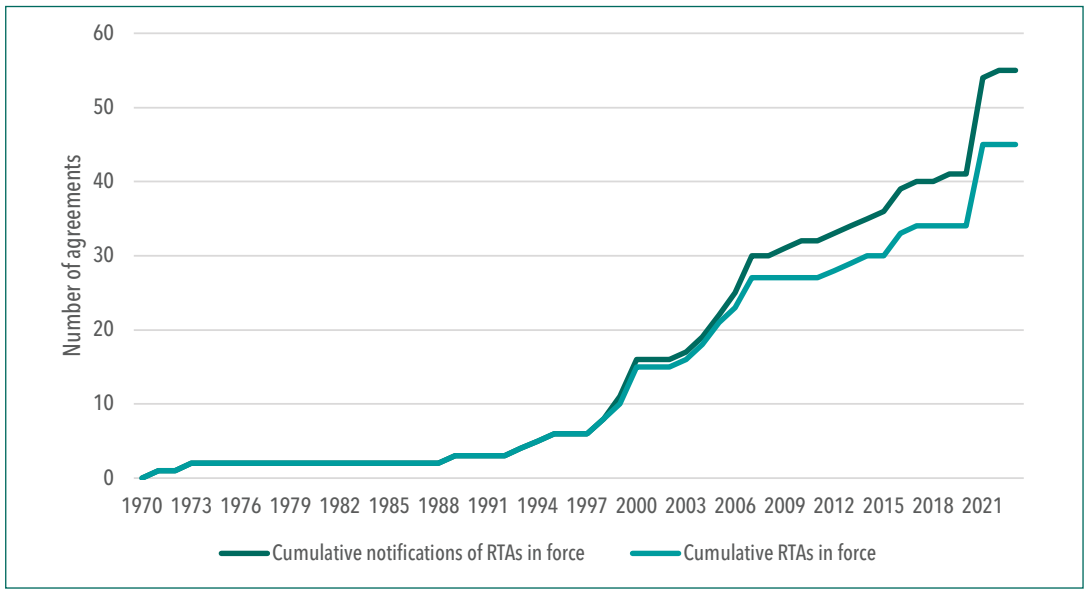
This chapter is organized as follows: The next section provides an overview of African RTAs now in force, whether with African or non-African trade partners, and briefly summarizes the main findings on the impact of these agreements on African trade. In the following section, we look at the depth of these agreements, that is, the different provisions included in the agreements, the degree of legal enforcement, and the presence of dispute settlement mechanisms. With this background, we empirically examine the impact of the different provisions on African agricultural trade. To do so, we use a gravity-type equation and investigate which provisions may be associated with greater bilateral trade between African countries and their African and non-African partners. Finally, in our conclusions we consider the main policy implications of this analysis for the AfCFTA.

An Overview of African RTAs and Agricultural Trade

The proliferation of RTAs over recent decades is often referred to as a "spaghetti bowl," a term first introduced by Bhagwati (1995) to describe the confusing tangle created by the multiplication of diverse trade agreements (Kloewer 2016). Within this spaghetti bowl, African countries are involved in nearly 10 percent of RTAs. Of today's 583 RTAs, African countries are part of 45 agreements in force and 50 notifications of RTAs submitted to the WTO (Figure 2.1).[4]

4 The number of notified agreements exceeds the number of agreements in force because not all agreements notified to the WTO enter in force.

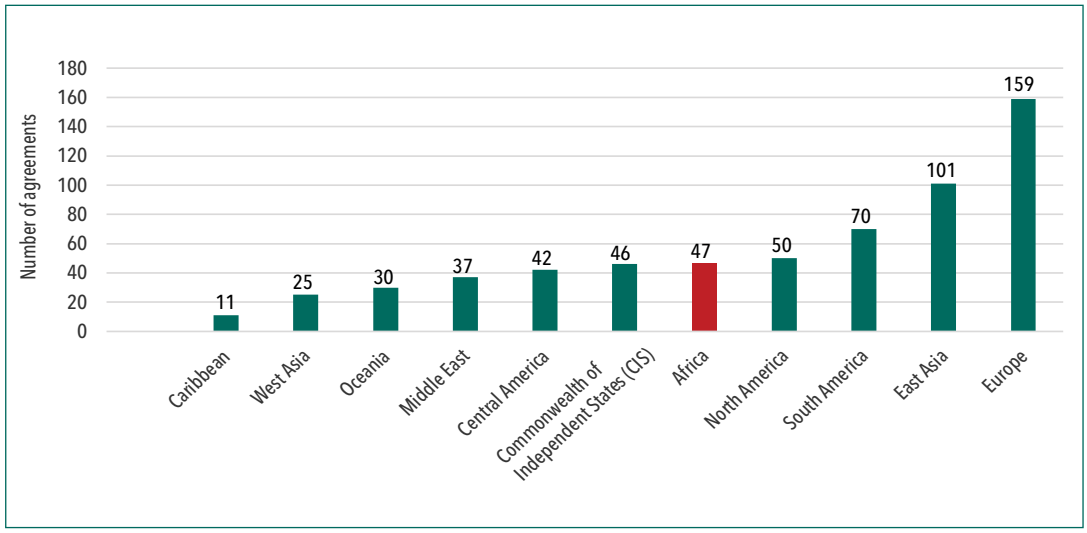
Figure 2.1 Evolution of RTAs in Africa, 1970-2023



Source: Constructed by the authors using the WTO Regional Trade Agreements database.
Note: RTAs in this figure are those categorized in the database as "RTAs with accession"; that is, these RTAs were in force before one or more member states later joined them.

Figure 2.2 depicts the number of RTA notifications made to the WTO by region. Notwithstanding the substantial heterogeneity in the economic size of these regions and the number of countries in each, this figure provides a simple overview of the participation of each region in trade agreements. With 47 notifications, Africa ranks fifth out of 11 regions and second (after South America) among developing and emerging regions.[5] The number of notified agreements is comparable to the Commonwealth of Independent States (CIS) (46 notified agreements) and Central America (42 notified agreements) and higher than other developing regions such as the Middle East, Oceania, West Asia, and the Caribbean.

Figure 2.2 Notification of RTAs in force, participation by region



Source: Constructed from the WTO Regional Trade Agreements database.

5 Based on WTO composition of regions, East Asia includes, among other developing countries, Japan and the Republic of Korea (South Korea), which are not developing countries. Moreover, North America includes Mexico, which is not a developed country.

Intra-African RTAs are part of African countries' integration through RECs and include both FTAs and customs unions. The largest intra-African FTA is the Common Market for Eastern and Southern Africa (COMESA), which includes 21 member states. COMESA member states launched a customs union in 2009 that aims to gradually implement a common external tariff.[6] Another major FTA was established under the Southern African Development Community (SADC) umbrella that groups 16 states. Five SADC member states also form the South African Customs Union (SACU)—Botswana, Lesotho, South Africa, Namibia, and Eswatini. The East African Community (EAC) currently includes seven member states, four of which are also COMESA members. EAC member countries established a customs union in 2004. In addition, COMESA and EAC have agreed to harmonize their common external tariff so that member countries of both RECs do not have to choose between the two blocs, and both RECs have agreed with SADC on the eventual creation of an FTA and the harmonization of the common external tariff.[7]

Another major customs union is operational under the Economic Community of West African States (ECOWAS) with 15 member states.[8] ECOWAS is the third largest REC after COMESA and SADC. Within ECOWAS, a smaller West African Economic and Monetary Union (WAEMU) includes 8 member states (Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, and Togo). The Economic Community of East African States (ECCAS) , with 11 member states, also plans to establish an FTA.[9] Six African countries established a customs union under the Economic and Monetary Community of Central Africa (CEMAC) in 1994, namely Cameroon, the Central African Republic, Chad, Equatorial Guinea, Gabon, and the Republic of the Congo. Finally, the Arab Maghreb Union (AMU) has the fewest member states among the African RECs, with only five countries. The AMU seeks to establish an FTA and a customs union.[10]

Trade agreements concluded between African and non-African partners are characterized by the predominant presence of Europe as one of Africa's major trade partners. Of the 26 such agreements in this analysis,[11] 10 are with the European Union/European Commission (EU/EC) and 4 with the European Free Trade Association (EFTA). These include EU/EC bilateral agreements with Algeria, Egypt, Morocco, Tunisia, Cameroon, Côte d'Ivoire, South Africa, and Ghana. A couple involve African regional blocks: the EU-SADC Agreement and the EU-ESA Agreement. A number of African countries are also party to agreements involving developing and emerging countries, such as the Global System of Trade Preferences (GSTP) and the Protocol on Trade Negotiations (PTN), the Agadir FTA, the Pan-Arab Free Trade Area (PAFTA), and bilateral agreements with Türkiye and MERCOSUR (the South American trade bloc).[12]

With regard to the multiplicity and complexity of African trade relations at both the continental and global levels, it is necessary to explore how these agreements have affected African agricultural trade. At the global level, more trade- and non-trade-related policy areas affecting agriculture are increasingly covered by RTAs (Thompson-Lipponen and Greenville 2019). However, in African RTAs, agricultural provisions are limited in scope and depth. Several African RTAs either provide limited coverage of selected agricultural goods or include a substantial list of exceptions. Agriculture is largely excluded from agreements between African countries

6 COMESA, https://www.comesa.int/comesa-customs-union/
7 COMESA, https://www.comesa.int/comesa-customs-union/
8 https://archive.uneca.org/oria/pages/ecowas-trade-and-market-integration
9 The ECCAS FTA is not yet in force (UNECA 2019).
10 The FTA under AMU is not yet operational (UNECA overview of Regional Economic Communities, https://archive.uneca.org/oria/pages/amu-trade-and-market-integration).
11 Our choice of RTAs is determined by the availability of data on provisions in the World Bank's Deep Trade Agreements database, which provides information on the detailed provisions content of 318 RTAs, in force and notified to the WTO and signed between 1958 and 2018 (Mattoo, Rocha, and Ruta 2020).
12 For a detailed list of the agreements, see Appendix Table A2.1.

and the European Union (EU), which as noted account for most of Africa's extraregional trade agreements. For example, RTAs between the EU and North African countries focus on trade liberalization in the manufacturing sector and largely ignore trade in agriculture and services. Oil and gas, chemicals, and machinery and equipment dominate trade flows under the EU–Algeria FTA.[13] In more diversified economies of North Africa, such as Egypt, Morocco, and Tunisia, trade in agricultural products is often subject to seasonal quotas. Moreover, many agrifood items, including fresh produce, grains, and processed products, are on the list of exceptions to the agreements and cannot benefit from tariff concessions.[14] In sub-Saharan Africa, trade between the EU and South Africa, for example, is dominated by fuels, mining products, machinery and equipment, and chemicals.[15]

Prior editions of the AATM have highlighted how relatively high and escalating tariffs impede African trade in agricultural products. African countries face higher tariffs on exports of key commodities, such as rice, maize, wheat, and potatoes, compared with the tariffs applied to their own imports of the same commodities (Goundan and Tadesse 2021). Moreover, African exports are subject to tariff escalation. For example, Goundan et al. (2022) found that African exports of processed sugar and wheat to other developing and emerging countries, including some in Latin America, the Caribbean, Asia, and the BRICS,[16] are subject to tariffs of up to 29 percent. At the intra-African level, extra-REC tariffs on key commodities (such as wheat, palm oil, and sugar) are substantially higher than equivalent REC tariffs. Intra-African tariffs also increase with the level of processing of cocoa, coffee, and tea (Aboushady et al. 2022).

African trade in agriculture also faces substantial non-tariff measures (NTMs), especially sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT). High NTMs substantially undermine the access of African products to international markets. At the same time, African countries impose high NTMs on their agricultural imports, whether from African or non-African countries. In the 2021 AATM, Bouët and Sall noted that, on the one hand, the ad valorem equivalent of NTMs imposed by African countries is especially high for vegetable saps and extracts, cocoa and cocoa preparations, and preparations of cereal and flour. On the other hand, NTMs imposed by Africa's most relevant and potential partners (such as the United States, some European countries, China, and India) are substantial. Among these partners, European countries impose the most burdensome NTMs, with an ad valorem equivalent of 49 percent for SPS measures and 73 percent for TBTs. Sectors heavily affected by NTMs are those where Africa is most competitive, such as cocoa and cocoa preparations, fruits and nuts, vegetables, coffee, and tea.

Heavy use of NTMs is often a tool to protect domestic producers, especially in countries with powerful agricultural lobbies, such as the EU and the United States. Moreover, Africa's major trade partners also subsidize their agriculture sectors. In the case of the EU, producer support creates a price wedge between domestic and international market levels of approximately 4 percent (EC 2016). Despite a gradual decrease in agricultural subsidies in the EU, producer support remains among the highest worldwide. The Organisation for Economic Co-operation and Development (OECD) agricultural support indicator data[17] show that the producer support estimate (PSE), measured by the support to farmers as a percentage of their gross farm receipts, was as high as 17.5 percent in the EU and 10.5 percent in the United States in 2021. Some

13 European Commission, https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/algeria_en
14 See, for example, the Egypt-EU and Morocco-EU exchange of letters concerning the reciprocal liberalization of agricultural products, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010D0240 and https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22012A0907(01)&from=EN
15 https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/south-africa_en
16 BRICS refers to Brazil, Russia, India, China, and South Africa.
17 https://data.oecd.org/agrpolicy/agricultural-support.htm

emerging markets also subsidize agriculture, such as China, which has the second highest PSE after the EU (16.2 percent). Consumer support estimates (CSE), measured by the transfers to consumers as a proportion of agricultural consumption, show that India's CSE is as high as 33.4 percent, followed by the United States (21.1 percent).

However, intraregional African trade is inhibited by stringent and complex rules of origin (not aligned with international practices) that prevent firms and businesses from taking advantage of the preferential concessions offered under the RTAs. A study by the United Nations Conference on Trade and Development (UNCTAD) and COMESA (2023) shows that the utilization rates[18] of trade preferences under COMESA, EAC, and SADC are 30 percent below the utilization rates of trade preferences with the EU. This implies the existence of substantial unused trade potential in the African region, hampering the establishment of its regional value chains. When faced with costly and complex rules of origin, firms usually forego the trade preferences of intra-African trade agreements, preferring to trade outside of these agreements.

As mentioned, the inclusion of agriculture in RTAs has been increasing over time, yet with substantial heterogeneity in the scope of coverage of provisions and the degree of their enforcement. Compared with trade in the manufacturing sector, a small (yet growing) number of studies analyze the impact of RTAs on African trade in agriculture. Overall, studies focused on Africa find a positive impact of FTAs under the RECs. For example, Chawarika et al. (2022) find that the SADC–FTA increased Zimbabwe's agricultural trade flows by more than 400 percent. Fadeyi et al. (2014) also find a net trade-creation effect of the SADC–FTA on intraregional beef and maize trade. Manu (2021) suggests that Ghana's bilateral trade in agriculture increases when its trade partners are members of the same FTA. Within ECOWAS, in particular, agricultural trade levels are high, and regional integration and trade facilitation are associated with increased agricultural exports between member states (Olayiwola et al. 2015). Sunge and Ngepah (2020) also conclude there is a positive effect on African trade in rice and maize through increased technical efficiency. At the extraregional level, however, a recent study on the impact of EU RTAs with African, Caribbean, and Pacific (ACP) countries on trade in agriculture finds that the cost of the EU's exports to these countries is generally lower than the cost of their exports to the EU. Thus, the EU benefits more from agricultural trade, given that it exports processed products, while ACP countries mainly export unprocessed agricultural products with high import costs into the EU (Balogh and Leitão 2019).

The literature relating the depth of trade agreements to the impact of specific provisions for agricultural trade is limited, especially when compared with the literature on trade in manufactured goods. Nevertheless, the way in which the depth of an agreement affects trade is comparable. For example, an RTA could lower the cost of trade among its members at the expense of third countries, thus diverting trade from outside the bloc. Yet, an agreement's outcomes are also determined by the scope of coverage of the various provisions and the degree of legal binding (Fontagné et al. 2021; Mattoo et al. 2017). Some provisions generally benefit RTA members vis-à-vis third countries; others reduce domestic regulations to make them non-discriminatory, thus resulting in net trade creation. An OECD study (Korinek and Melatos 2009) finds that COMESA, the ASEAN–FTA (AFTA), and MERCOSUR are associated with increased intraregional agricultural trade and net trade creation. However, the depth of integration plays an essential role in the extent of trade creation. In the case of MERCOSUR, trade creation is larger because the agreement is deeper. Another OECD study (Fulponi et al. 2011) finds that among 50 RTAs, South–South agreements (especially Asian Pacific agreements

18 Utilization rate is an instrument that is used to measure how firms can effectively use an FTA to benefit from trade preferences that are granted by these agreements. This indicator can help policymakers undertake the necessary reforms and policy actions to enhance an RTA's attractiveness and its business-friendliness.

and Latin American agreements) eliminated over 90 percent of the tariffs on agricultural goods. However, little has been achieved in the harmonization of SPS provisions. In the same vein, Mattoo et al. (2017) use data on 279 RTAs and find that deeper trade agreements lead to greater net trade creation than shallow agreements that only focus on tariffs. However, a European Commission (2016) study finds that the EU–Mexican FTA increased Mexican agricultural exports to the EU, despite this agreement being shallow (as is typical of "first-generation" agreements). At the same time, the EU–South Korea Deep Trade Agreement has substantially increased trade in agriculture even before the full implementation of all provisions of the agreement. Finally, in their study on ASEAN countries, Bouët et al. (2022) find that agricultural integration in Southeast Asia is rather shallow, being largely focused on the elimination of intraregional tariffs. Within ASEAN, NTMs are persistently high and are frequently imposed on imports of food and agricultural products. Thus, improving customs procedures and harmonizing SPS measures and TBT could deepen the regional integration.

In sum, the presence of trade agreements does not guarantee that intraregional trade is effectively free and that trade flows will increase. For RTAs to boost trade in agriculture, both horizontal depth and vertical depth are necessary. As it was mentioned, *horizontal depth* of different provisions that directly or indirectly affect trade in agriculture goes beyond tariff dismantlement to include harmonization of standards and policies related to services, investments, and other relevant policy areas that could distort trade. *Vertical depth* is indispensable because the included provisions should be legally enforced and supported by a dispute settlement mechanism to be effective. In the next section, we discuss these two features of deep trade agreements and evaluate the horizontal and vertical depth of African RTAs.

Analysis of the Depth of Agreements

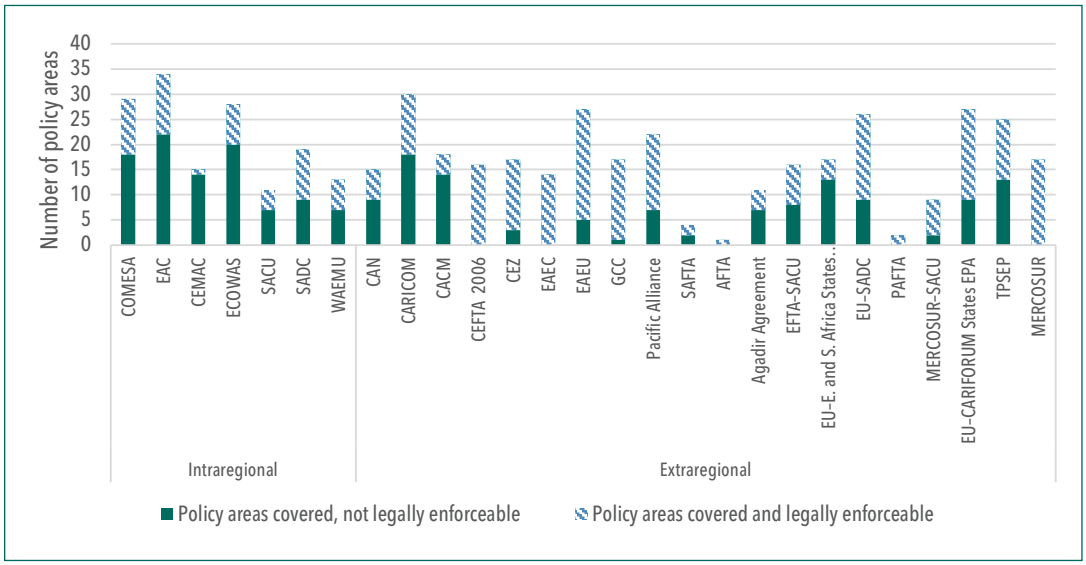
In this section, we examine the horizontal and vertical depth of 7 intra-African RTAs and 26 African RTAs with non-African partners.[19] The *horizontal depth* of the agreement refers to the number of provisions[20] included in each agreement. The *vertical depth* refers to the legal enforceability of provisions and the availability of dispute settlement mechanisms. Hence, we interpret the depth of an RTA as a positive function of the number of provisions mentioned in the agreement, the number of legally enforceable provisions, and the number of provisions subject to dispute settlement. We also compare the depth of African RTAs to other trade agreements involving non-African emerging or developing countries.

Figure 2.3 provides an overall picture of policy coverage and legal enforcement of provisions in African and non-African RTAs (those not including African countries). By and large, African and non-African RTAs tend to be stronger on the horizontal than the vertical aspects. In other words, these agreements include many provisions under the different policy areas, but only a few are fully legally enforced. Exceptions where the number of included provisions is roughly equal to the number of legally enforced provisions include the Central European Free Trade Agreement 2006 (CEFTA), Common Economic Zone (CEZ), Gulf Cooperation Council (GCC), Eurasian Economic Community (EAEC), Eurasian Economic Union (EAEU), MERCOSUR, and PAFTA.

19 The analysis is based on the World Bank Deep Trade Agreements (DTAs) database, which provides information on the detailed provisions content of 318 RTAs, in force and notified to the WTO, signed between 1958 and 2018 (Mattoo, Rocha, and Ruta 2020).
20 The World Bank DTAs database maps 52 provisions in the 318 RTAs. These provisions are divided into two groups. One is the group of provisions falling under the current mandate of the WTO and already subject to some form of commitment in WTO agreements, referred to as WTO-plus areas. Second is the group of obligations that are outside the current mandate of the WTO, referred to as WTO-X.

Horizontally, intra-African agreements tend to be shallower than agreements in other emerging regions. Only three African agreements cover 20 or more policy area provisions, namely COMESA, EAC, and ECOWAS. Intra-African agreements are also vertically shallow, as less than half of the included provisions are legally enforced. For example, for EAC, only 12 of the 34 included provisions are legally enforceable. Among extraregional agreements, only the agreement between the European Union and SADC covers more than 20 policy areas, among which 17 are legally enforceable. Yet, the agreements between EFTA and SACU, and between the European Union and the Eastern and Southern Africa States Interim Economic Partnership (EPA) cover fewer policy areas and are shallower.

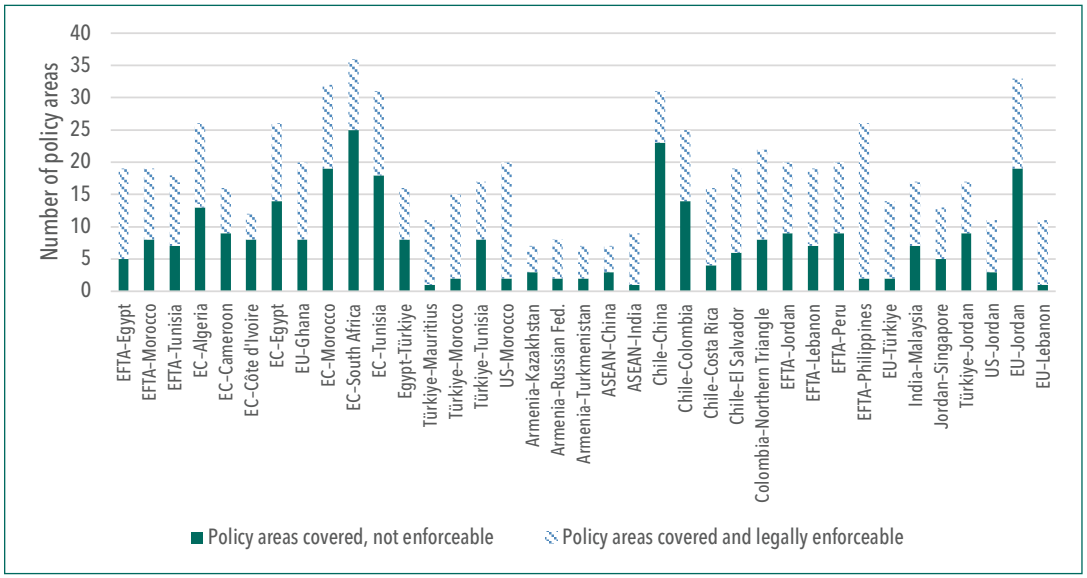
Figure 2.3 Policy areas coverage and legal enforceability at the regional level



Source: Constructed from the World Bank Deep Trade Agreements database.
Note: Intraregional agreements are RTAs involving African countries only. Extraregional agreements include agreements between African and non-African countries and agreements involving only third countries.

Figure 2.4 shows the horizontal and vertical depth of agreements in selected bilateral agreements that include one African and other non-African countries or regions. The figure suggests that Algeria, Cameroon, Côte d'Ivoire, Egypt, Ghana, Mauritius, Morocco, South Africa, and Tunisia are the African countries that tend to establish deep trade agreements. Most agreements include more policy area provisions than fully legally enforceable ones. In addition, by comparing the agreements between the EU and African countries such as Algeria, Egypt, Morocco, and Tunisia, and those between the EU and Middle Eastern countries like Jordan, the figure shows that they have the same vertical depth. For example, the agreement between the EU and Morocco includes 32 provisions, 13 of which are legally enforceable, whereas the agreement between the EU and Jordan includes 33 provisions with 14 that are legally enforceable. At the bilateral level, the agreements between Türkiye and Mauritius and between Türkiye and Morocco are relatively deeper than those between Türkiye and Jordan, India and Malaysia, and Jordan and Singapore.

Figure 2.4 Policy areas coverage and legal enforceability in selected agreements including African countries and non-African partners



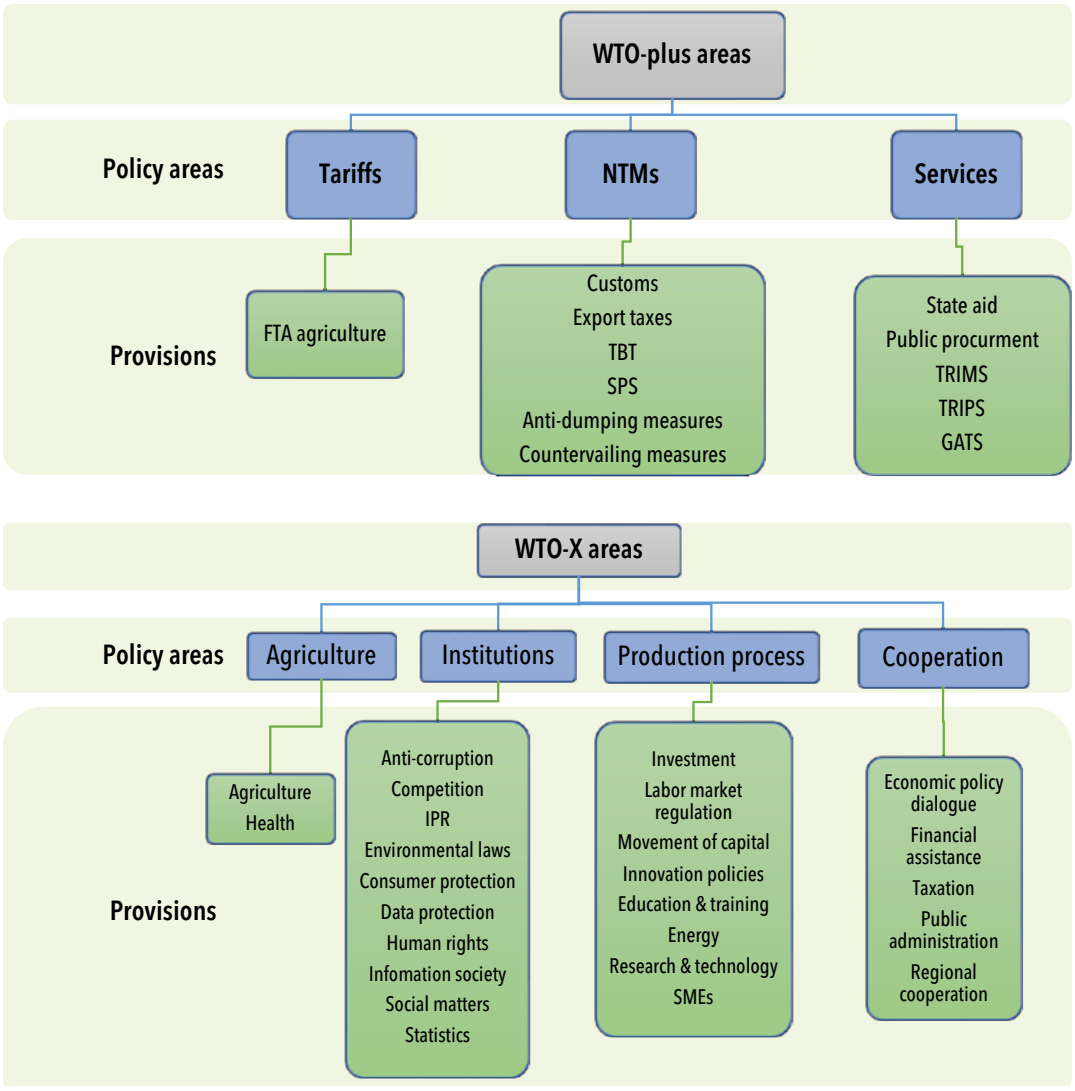
Source: Constructed from the World Bank Deep Trade Agreements database.
Note: Chilean agreements with Costa Rica and El Salvador are through the Chile–Central America agreement; Northern Triangle refers to El Salvador, Guatemala, and Honduras.

Type of provisions: Horizontal depth of the agreements

For the purpose of this analysis, we select 37 of the 52 provisions mapped in the World Bank Deep Trade Agreements database. Our selection is based on the relevance of these trade- and non-trade-related provisions to trade in agriculture. Figure 2.5 shows the classification of the selected 12 WTO-plus provisions and 25 WTO-X provisions according to major policy areas that matter for trade in agriculture in Africa. The WTO-plus provisions are grouped into three areas: (1) tariff liberalization for agricultural products; (2) NTMs such as customs and trade facilitation, export taxes, TBTs, SPS measures, anti-dumping, and countervailing measures (CVM); and (3) trade liberalization in services (GATS), trade-related investment measures (TRIMS), trade-related intellectual property rights (TRIPS), and public procurement.

The selected WTO-X provisions are categorized into four areas: (1) agricultural policies related to conducting modernization projects, exchanging information in this sector, and monitoring diseases and developing health information systems; (2) provisions related to institutions and regulations to fight corruption, foster competition, enforce intellectual property rights (IPRs), protect the environment and consumers, develop information and statistical systems, respect human rights, and improve social security systems; (3) provisions pertaining to production processes and factors of production, such as labor, human capital, investment and financial capital, energy, technology, and technical assistance for small and medium enterprises (SMEs); and (4) matters of cooperation, including economic policy dialogue to exchange ideas and undertake joint studies, financial assistance, assistance in fiscal policy reforms, and fostering regional cooperation. More details on the provisions included under each policy area are found in Appendix Table 2.2.

Figure 2.5 Classification of WTO-plus and WTO-X policy areas and provisions



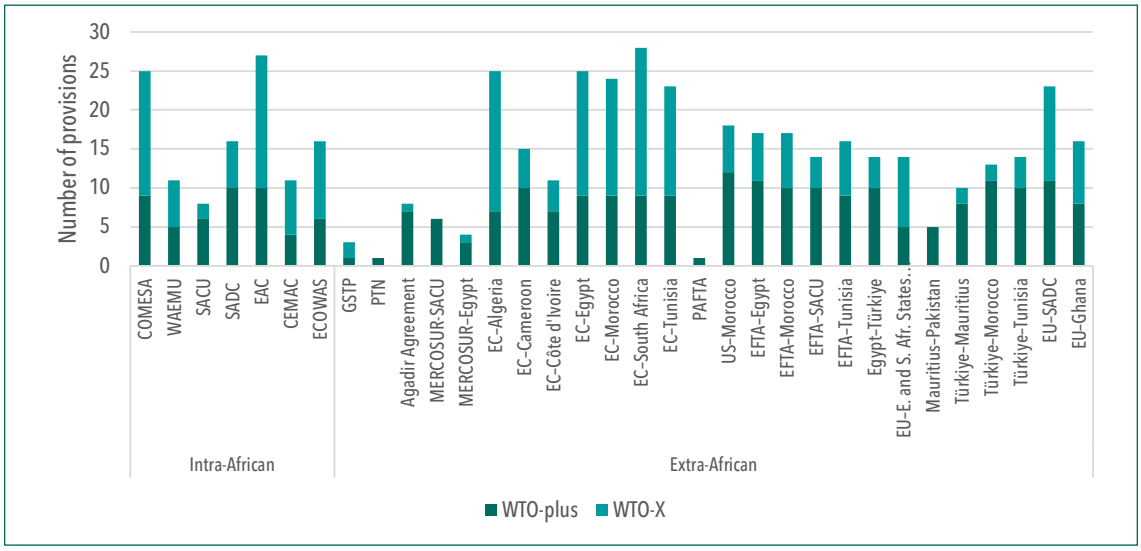
Source: Authors' elaboration.

To assess the horizontal coverage of the African trade agreements of WTO-plus and WTO-X provisions, we proceed in two ways: first, we compare the horizontal depth, that is, the *number of provisions* included in African and non-African RTAs. Second, we compare the *provisions by type*. In other words, we explore which type of provisions are included in African compared with non-African agreements.

Figure 2.6 illustrates horizontal depth by showing the number of provisions included in intra-African agreements, agreements between African and non-African countries, and third-party agreements. In our analysis, an agreement is horizontally deep if it covers at least 49 percent of the total number of provision types (18 of the 37 selected provisions). At the intra-African level, two agreements are considered horizontally deep, namely COMESA (including 25 provisions) and EAC (including 27 provisions). Seven agreements between African and non-African countries are also considered horizontally deep. These include the agreements between the European Community (EC) and Algeria, Egypt, Morocco, South Africa, and Tunisia, the agreement between the United States and Morocco, and the agreement between the EU and

SADC. Compared to third-country agreements, African agreements are at the same level of horizontal depth as the Pacific Alliance, and include more policy areas (that is, are deeper) than GCC and MERCOSUR (15 provisions each) and CEFTA (14 provisions). However, they are horizontally shallower than the Caribbean Community and Common Market (CARICOM) and EAEU (each with 24 provisions) and the Trans-Pacific Strategic Economic Partnership (TPSEP) (with 21 provisions).[21] At the country level, the agreements between the EC and Algeria, EC and Egypt, and EC and Morocco have approximately the same horizontal depth as third-country agreements such as those between the EC and Jordan and between India and Japan. Yet, they are deeper than the EC–Lebanon agreement but shallower than the EC–Mexico agreement. Moreover, some African agreements cover more WTO-X provisions than WTO-plus provisions. These include the EAC, ECOWAS, COMESA, WAEMU, and most of the agreements between the EC and African countries.

Figure 2.6 Horizontal depth of selected WTO-plus and WTO-X provisions in intra-African and extra-African agreements

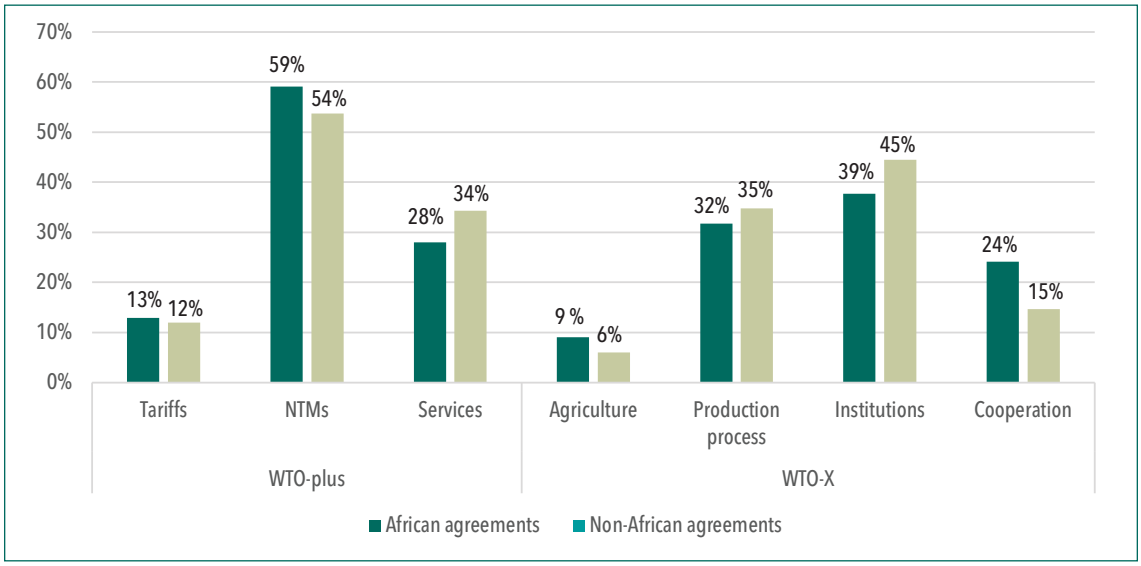


Source: Constructed from the World Bank Deep Trade Agreements database.
Note: Extra-African agreements are those concluded between African and non-African countries.

Figure 2.7 presents the horizontal depth of WTO-plus and WTO-X provisions in African and non-African agreements by type of provision. Among WTO-plus provisions, NTMs are the type of policy most frequently included in African as well as non-African agreements. NTMs represent 59 and 54 percent of total WTO-plus provisions in African and non-African agreements respectively, whereas provisions in the area of services represent 28 and 34 percent, and tariffs represent 13 and 12 percent respectively for the same agreements. Among WTO-X policy areas, provisions related to institutions represent 38 and 45 percent of total provisions in African and non-African agreements, respectively; followed by provisions related to the production process (32 and 35 percent), cooperation (24 and 15 percent) and agriculture (9 and 6 percent).

21 The figures are based on the count of provisions included in each agreement based on the World Bank Deep Trade Agreements database.

Figure 2.7 Share of WTO-plus and WTO-X provisions in African and non-African agreements, by type of provision

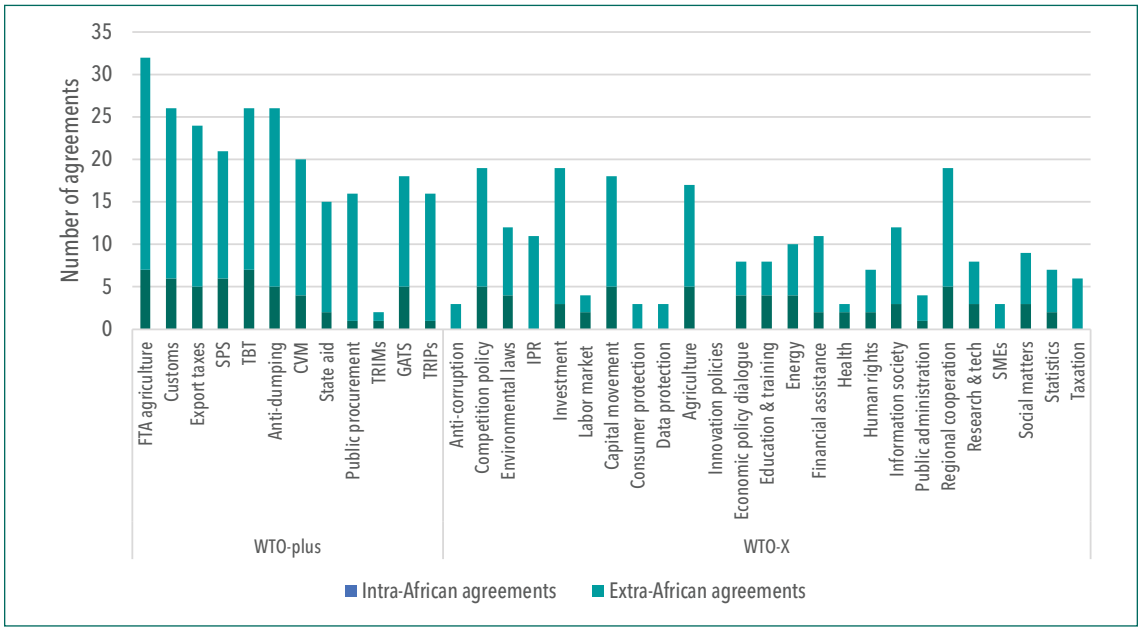


Source: Constructed from the World Bank Deep Trade Agreements database.

Figure 2.8 shows the number of African agreements that cover each of the selected 37 WTO-plus and WTO-X provisions. It is worth noting that there are 7 intra-African agreements and 26 extra-African agreements (those including an African and a non-African partner). Tariff liberalization in agricultural trade is covered by the largest number of agreements, including all 7 intra-African agreements and 25 of the extra-African agreements. Other WTO-plus areas that are covered by many agreements are NTMs, including customs, SPS measures, TBTs, anti-dumping and countervailing measures, and export taxes. However, services provisions are present in less than half of the agreements. Within this category, provisions related to TRIMS are covered by only one intra-African and one extra-African agreement. WTO-X areas are generally included in less than half of the African agreements. Nearly half of the African agreements include provisions related to technical assistance and modernization projects in the agriculture sector, provisions related to institutions (such as competition policy and environmental laws), provisions related to production processes (such as the movement of capital and investments), and provisions related to cooperation (like regional cooperation). Areas pertaining to energy, education and training, economic policy and dialogue, and research and technology are covered equally by intra- and extra-African agreements. Anti-corruption, consumer protection, data protection, SMEs, and taxation are covered only by extraregional agreements. Innovation provisions are completely absent from both intra- and extra-African agreements.

When comparing African agreements with trade agreements of other emerging countries, both types of WTO-plus and WTO-X policy areas are more often covered in extraregional non-African agreements, such as the CEFTA, CEZ, EAEC, EAEU, GCC, and MERCOSUR. However, the latter focus relatively more on WTO-plus areas, and more specifically on FTA in agriculture and provisions related to NTMs and services. Among WTO-X provisions, non-African agreements include more provisions related to competition policy, IPR, environment, investment, and movement of capital. The least frequently included provisions are taxation and human rights.

Figure 2.8 Number of African RTAs including WTO-plus and WTO-X provisions



Source: Constructed from the World Bank Deep Trade Agreements database.

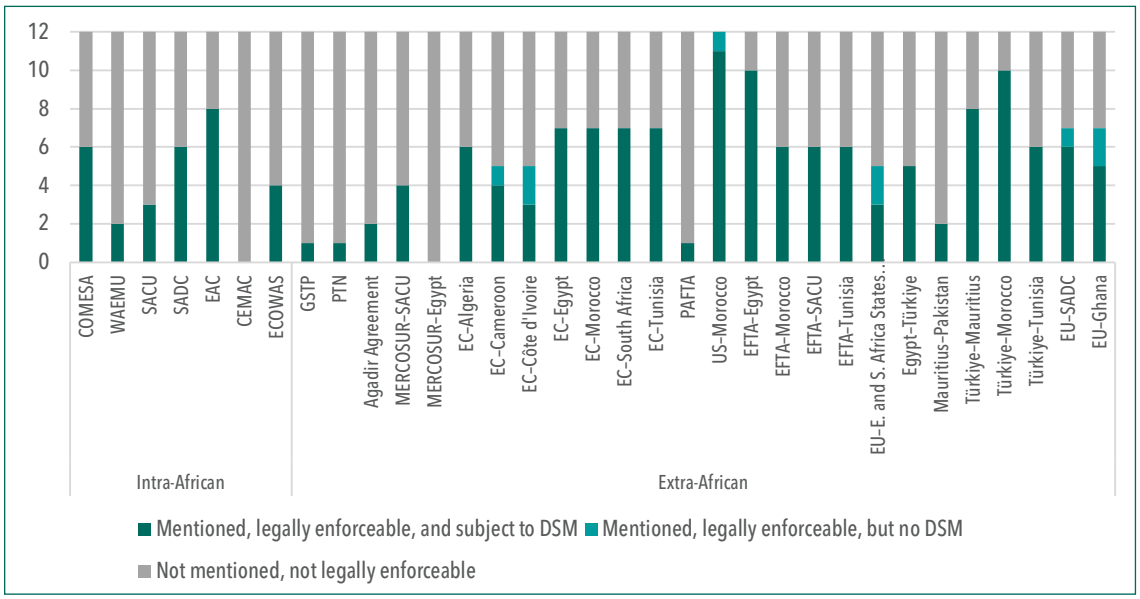
Enforcement of provisions: Vertical depth of the agreements

This section assesses the *vertical depth* of African agreements across WTO-plus and WTO-X provisions. Thus, the assessment is not only based on whether provisions are included in the agreement but also on whether they are (1) legally enforceable and (2) subject to dispute settlement mechanisms (DSMs). We conduct this analysis at three levels: the agreement level, the policy area level, and the provision level.

At the agreement level, Figure 2.9 presents the vertical depth of African agreements for WTO-plus provisions and Figure 2.10 for WTO-X provisions. Figure 2.9 shows that, in general, African RTAs with non-African partners include a larger share of legally enforceable provisions compared with intra-African agreements. Moreover, the majority of these enforceable provisions are subject to dispute settlement. At the intra-African level, COMESA, SADC, and EAC are the deepest agreements. These contain the greatest number of provisions that are legally enforceable and subject to a DSM (8 provisions out of 12). At the extraregional level (bilateral, including one African country), those between the United States and Morocco, between EFTA and Egypt, and between Türkiye and Morocco are the deepest, including at least 10 legally enforceable provisions with a DSM. In contrast, the multinational GSTP and PTN are among the shallowest agreements, with only 1 of 12 provisions that is legally enforceable and subject to a DSM. Agreements between the EC and African countries including Egypt, Ghana, Morocco, South Africa, and Tunisia are relatively deep, as more than half of the provisions are included, legally enforceable, and subject to a DSM. The agreements between the EC and Cameroon, the EC and Côte d'Ivoire, the United States and Morocco, the EU and SADC, and EU and Ghana include some provisions related to anti-dumping and countervailing measures that are legally enforceable but not subject to a DSM.

When comparing intra-African agreements to agreements between third countries, such as MERCOSUR, CEFTA, the Commonwealth of Independent States (CIS), the EAEU, and the TPSEP agreements, as well as the bilateral agreements between the United States and some Middle Eastern countries including Bahrain and Oman, we find that the latter are vertically deeper as they have mechanisms for legally enforcing almost all 12 provisions of the WTO-plus areas.[22] Two African agreements—COMESA and SADC—have the same vertical depth as the GCC, with around half of the WTO-plus areas being fully legally enforceable. Finally, intra-African agreements are vertically deeper than the EAEC, South Asian Free Trade Area (SAFTA), and Latin American Integration Association (LAIA), and the US–Jordan bilateral agreement.

Figure 2.9 Vertical depth of African agreements, WTO-plus provisions

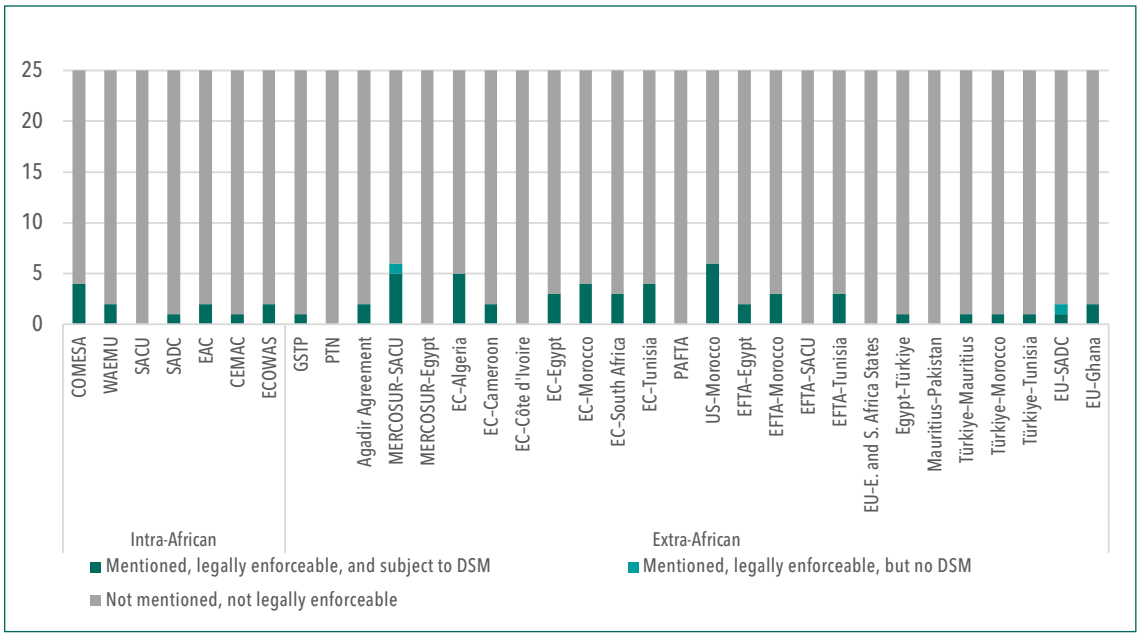


Source: Constructed from the World Bank Deep Trade Agreements database.

Figure 2.10 depicts vertical depth of the different agreements for WTO-X provisions. Overall, intra- and extra-African agreements as well as third-country agreements appear to be shallower for these policy areas. On average, more than 20 out of 25 WTO-X provisions are not legally enforceable. At the intra-African level, COMESA, WAEMU, and EAC enforce provisions related to competition policy, movement of capital, and investment. Moreover, ECOWAS and CEMAC have a minimal share of enforceable provisions (two provisions and one provision, respectively). At the bilateral level, the Egypt–MERCOSUR, the EC–Algeria, and the US–Morocco agreements each include at least five provisions that are legally enforceable. Most of the other agreements remain relatively shallow, with about two or three legally enforceable provisions.

22 The only exception for the EAEU is that it does not mention or legally enforce the TRIMS provision.

Figure 2.10 Vertical depth of African agreements, WTO-X provisions

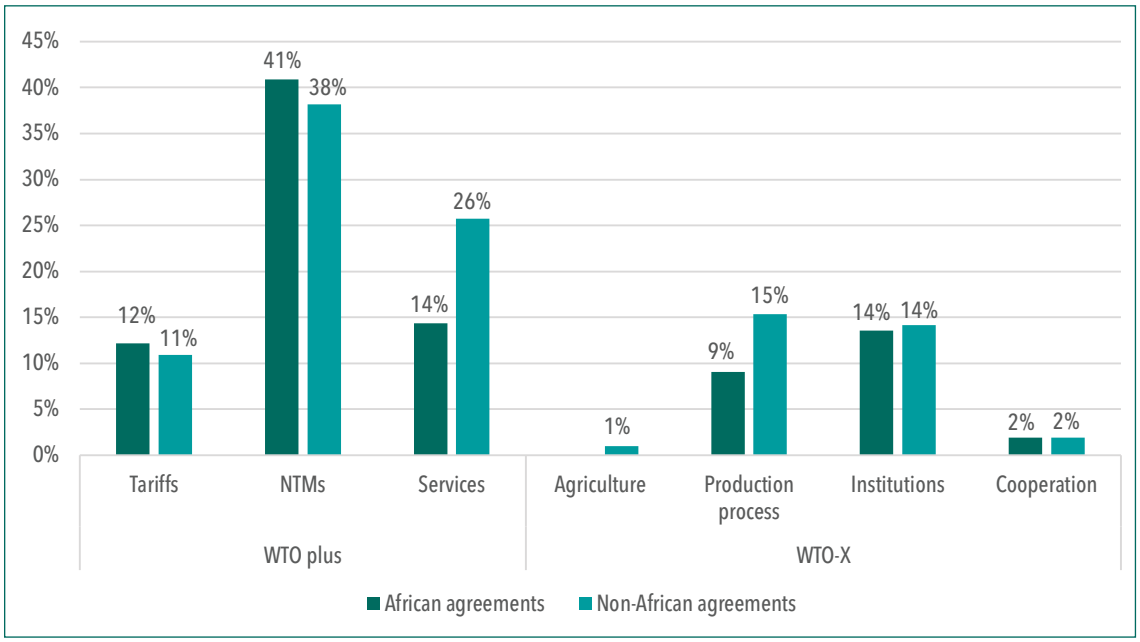


Source: Constructed from the World Bank Deep Trade Agreements database.

Figure 2.11 depicts the vertical depth of African- and non-African agreements across the different policy areas. WTO-plus policy areas are more fully legally enforceable than WTO-X ones. Within the WTO-plus area, NTMs provisions are the most frequently legally enforceable and subject to DSMs in both African and non-African agreements. Around 41 percent[23] of included NTM provisions are fully legally enforceable in African agreements and 38 percent in non-African agreements. Services are more frequently legally enforceable in non-African agreements, whereas tariffs are more often legally enforceable in African agreements. For the WTO-X policy areas, the shares of provisions that are legally enforceable are typically lower than in WTO-plus areas. This holds true for both African and non-African agreements. Interestingly, none of the provisions concerning agriculture are legally enforceable in any of the African agreements and only 1 percent of these are enforceable in non-African agreements. Enforceable provisions related to institutions and the production process are relatively more common in both types of agreements. Finally, the share of enforceable provisions pertaining to cooperation is fairly small (2 percent).

23 Figures are calculated by dividing the number of provisions that are fully legally enforceable in each policy area by the total number of provisions included in the agreements.

Figure 2.11 Share of legally enforceable WTO-plus and WTO-X provisions in African and non-African agreements, by type



Source: Constructed from the World Bank Deep Trade Agreements database.

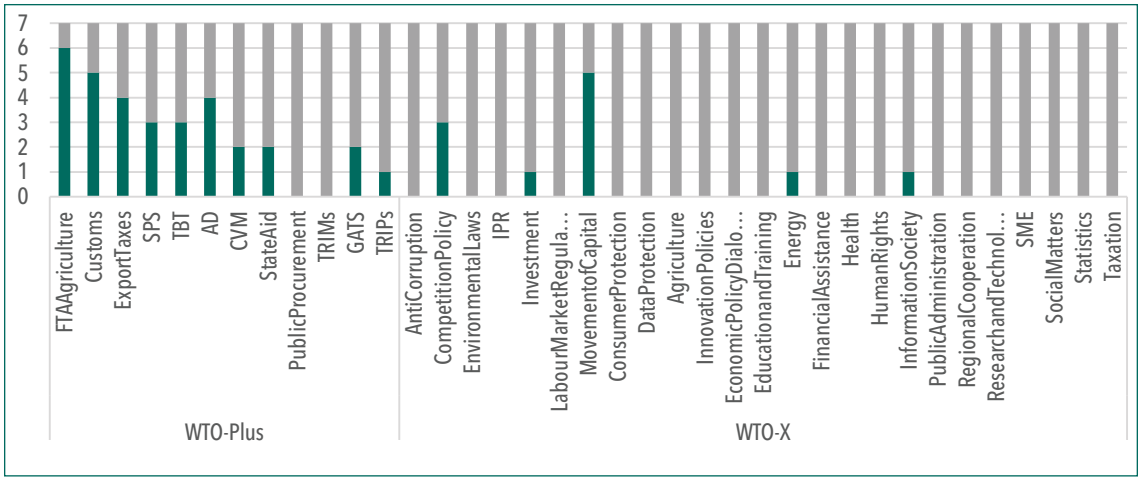
Figure 2.12 presents the vertical depth of intra- and extra-African agreements, shown as the number of agreements that provide for legal enforcement of each provision. As illustrated in Panel A of the figure, intra-African agreements tend to be vertically deeper when it comes to WTO-plus provisions related to tariff liberalization and NTMs. For example, six out of seven intra-African agreements include legally enforceable provisions related to tariff liberalization in agriculture that are subject to a DSM. Between two and five agreements provide for legal enforcement of NTM provisions with a DSM. In the services policy area, state aid and GATS are legally enforceable in two intra-African agreements—the COMESA–EAC and the SADC–ECOWAS agreements, respectively. The TRIPS provision is only enforceable in SADC, whereas TRIMS is completely absent from all intra-African agreements.

WTO-X provisions tend to be less enforceable in intra-African agreements than WTO-plus provisions. Of 25 provisions, 19 are not mentioned or legally enforceable in any agreement. Five agreements provide for enforcement of provisions related to the movement of capital, and three for provisions related to competition policy (mainly in COMESA, WAEMU, and EAC).

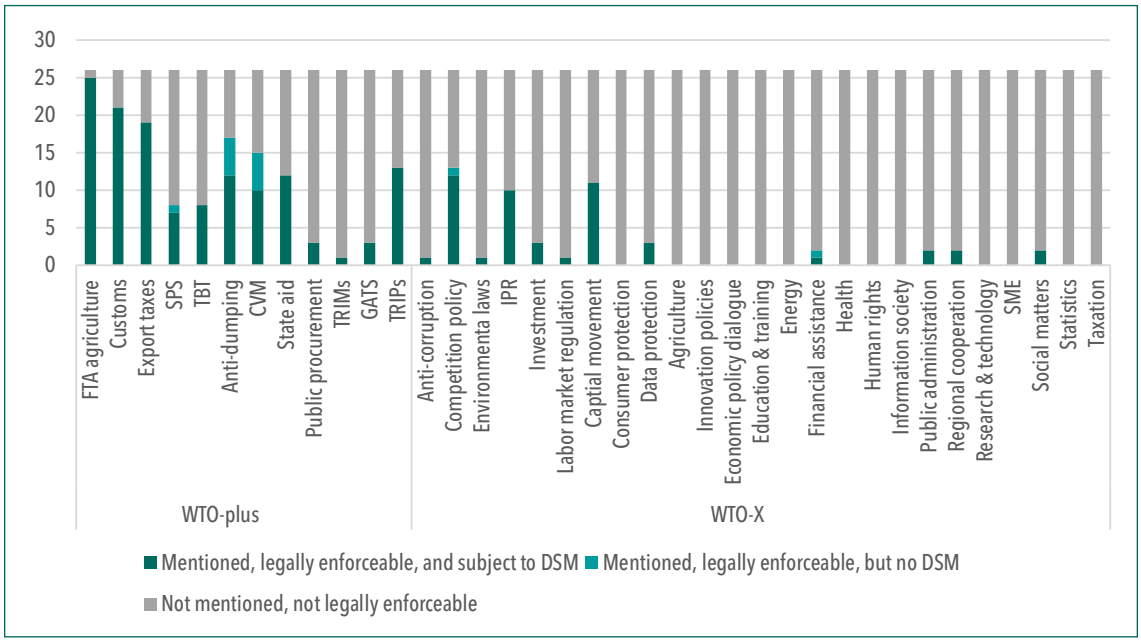
In the case of extra-African agreements (Figure 2.12, Panel B), a similar pattern of vertical depth can be observed. Overall, provisions related to tariffs and NTMs are enforced by a larger number of agreements than provisions related to services, whereas these agreements are shallower for WTO-X provisions. Extra-African agreements such as the Agadir Agreement, PAFTA, most EC agreements with African countries, and the EU–SADC, EU–Ghana, and MERCOSUR–SACU agreements are vertically deep for WTO-plus provisions relating to free trade in agriculture, customs, and export taxes. Other NTMs, such as SPS, anti-dumping, and countervailing measures are mentioned and legally enforceable but not subject to DSMs in the US–Morocco agreement, the plurilateral agreements between the EC and some African countries, and the EU-SADC and the EU–Ghana agreements. For WTO-X areas, competition policy, IPR, and movement of capital provisions are the most frequently legally enforceable ones in the same extraregional agreements.

Figure 2.12 Vertical depth of African agreements per provision

(a) Intra-African agreements



(b) Extra-African agreements



Source: Constructed from the World Bank Deep Trade Agreements database.

Which Provisions Matter for Trade in Agriculture?

In this section, we conduct an empirical examination of the impact of the depth of different provisions in trade agreements on trade in agricultural products. Our sample also includes non-agricultural products as a point of comparison and to show how some provisions are more consequential for trade in agriculture.

Methodology

The methodology used in this chapter draws on the pioneering work of Tinbergen (1962) and Anderson (1979): the gravity model, which has become an essential empirical tool for assessing the determinants of international trade. The gravity model has undergone significant theoretical and empirical improvements since its inception (Mac Callum 1995; Feenstra 2002; Anderson and van Wincoop 2003; Evenett and Keller 2002; Santos Silva and Tenreyro 2011), reinforcing its theoretical base. At the core of this model is the fact that the volume of trade between two countries is proportional to their economic mass (measured by their GDP) and inversely proportional to the cost of trade. We extend this analysis by taking trade agreements and their depth into account as follows:

$$X_{ijkt} = \exp\left[\alpha Prov_{ijt} + \theta_{it} + \theta_{jt} + \delta_{ij} + \eta_{ijkt}\right]$$

where X measures the value of exports (FOB prices in US dollars) from country *i* to country *j* in year *t* and product *k*; and *Prov* measures both the horizontal and the vertical depth of different provisions. As suggested by Anderson and van Wincoop (2003), we include different fixed effects to control for unobservable country-specific characteristics as well as pair-specific characteristics (see Baier et al. 2019). Thus, to control for multilateral resistance,[24] we include exporter-time and importer-time fixed effects. This helps control for any observable and unobservable time-varying characteristics specific to each exporter (θ_{it}) and importer (θ_{jt}). In addition, as we have a panel dataset of agricultural and non-agricultural products at the HS2 level, we include bilateral fixed effects (δ_{ij}) to control for the endogeneity of trade policy and for all time-invariant characteristics specific to country pairs (Baier and Bergstrand 2007). η_{ijkt} is the idiosyncratic error term and errors are clustered at the exporter-importer level.

Several empirical remarks are worth mentioning. First, we do not use the log-transformation of the model (Santos Silva and Tenreyro 2011) to avoid losing zero trade flows. Thus, we estimate the gravity equation using panel data with the Poisson pseudo maximum likelihood (PPML) estimator to consider zero flows and to take into account the issue of heteroscedasticity in bilateral trade data. Second, our main variable of interest, namely *Prov*, focuses on provisions that might directly or indirectly affect trade in agriculture (see Appendix Table A2.2 for the list of provisions taken into account). These provisions are introduced in several ways.

First, to measure vertical depth, each provision is introduced individually and takes four values: 0 if there is no agreement between the exporter and the importer; 1 if there is an agreement without the provision in question; 2 if there is an agreement with the provision; and 3 if there is an agreement with the provision that is legally enforceable. We also group different provisions into broader groups. For the WTO-plus group, we divide the provisions into: trade liberalization, NTMs, and services. We divide the WTO-X provisions into four groups: agriculture, cooperation, quality of institutions, and production process. These provisions are combined together to construct a depth index following Guillin et al. (2023) as follows:

$$Depth=N_{LE}/max(N)$$

where N_{LE} is the number of legally enforceable items and max(N) is the maximum number of provisions.

Second, to measure horizontal depth, we simply focus on the number of provisions included in each agreement.

24 The "multilateral resistance terms" capture the fact that bilateral trade depends not only on bilateral trade barriers but also on average trade barriers across all trade partners

Our data come from two main sources: The trade data for 2003-2021 come from the 2023 AATM dataset (based on the COMTRADE dataset) for all African exporters and their 180 partners. The second source is the Deep Trade Agreements database (World Bank) described previously. All the regressions are run separately for agriculture (HS2 codes 1 to 24) and non-agriculture (25 to 99).

Results

Our aggregate results are summarized in Table 2.1.[25] First, both vertical and horizontal depth of WTO-plus provisions affect agricultural exports more than non-agricultural exports in Africa. It is important to recall that, by horizontal depth, we mean the variety of provisions included in an agreement, and that by vertical depth, we refer to the enforceability or the bindingness of the agreement. Notably, different provisions exhibit different patterns. Table 2.1 shows that provisions related to agriculture, as expected, have a stronger effect on agricultural exports than they do on non-agricultural exports. While this result is promising as it confirms the importance of including agricultural provisions in trade agreements, it has to be interpreted with caution given that, in the end, it is important to guarantee the enforceability of such articles.

In addition, generally, the effect of provisions related to NTMs on agricultural products is positive and statistically significant for both horizontal and vertical depth, while it is not for non-agricultural products. Surprisingly, the overall impact of provisions related to services is insignificant for both agricultural and non-agricultural products.

Regarding the impact of WTO-X provisions, their overall impact is positive and statistically significant for both agricultural and non-agricultural goods, with a stronger effect on the former than the latter, especially for provisions related to the production process and the quality of institutions. Indeed, Korinek and Melatos (2009) argue that the lack of transport and communications infrastructure, along with other supply constraints, can reduce the effect of the RTA on agricultural trade flows. For the role of institutions, we find a positive and statistically significant impact of the inclusion of enforceable provisions related to the quality of institutions (which includes anti-corruption, competition policy, environmental laws, IPR, consumer protection, data protection, human rights, information society, and so on). This is in line with Sunge and Ngepah (2020) who, using maize and rice data, show that both RTAs and control of corruption help improve technical efficiency. More generally, the literature on trade and institutions shows that improved institutions enhance trust, enforce contracts, and reduce transaction costs (Yildirim and Gokalp 2016; Karam and Zaki 2019), which increases technical efficiency.

Obviously, the impact of deep provisions (measured vertically and horizontally) is stronger for agricultural exports than non-agricultural ones, as the former are perishable, face comparatively many NTMs, and may face lengthy customs procedures. For this reason, when trade agreements include provisions related to agriculture liberalization, to the improvement of the production process, to the quality of institutions, and to NTMs, trade in agriculture is likely to significantly increase. Yet, this overall effect hides substantial heterogeneity. Tables 2.2 and 2.3 present the detailed results of each individual provision.

Three conclusions stand out. First, agreements without provisions that are related to the agriculture sector have a negative and statistically significant coefficient, suggesting that these agreements could be associated with a trade diversion effect[26] (that is, these agreements

25 The results are presented in detail in Tables A2.4 to A2.11.
26 All the elasticities are computed as follows {exp[b-0.5*Var(b)]-1}*100, where b is the estimated coefficient and Var(b) is the variance of b.

could increase trade among countries within the agreement but reduce their trade with countries outside of the agreement). If trade is diverted from more efficient countries outside of the agreement to less efficient countries within it, the trade diversion effect could result in an overall decrease in trade. This applies to agreements that lack provisions related to agriculture liberalization; NTMs (customs, exports taxes, SPS, TBT, countervailing measures, and anti-dumping); competition policy (institutions); and investment and movement of capital (production processes), where we see a trade reduction between 12.0 and 46.8 percent. In all these cases, countries may have an agreement, but without provisions related to these dimensions, such agreements are vertically shallow and are associated with trade diversion.

Second, inclusion of provisions on NTMs is important, as it increases exports of agricultural products between 20 percent (for TBT) and 26 percent (for SPS). This is expected as agricultural products are more affected by SPS, which are applied to protect human, animal, or plant life or health from risks arising from additives and contaminants in food. Vertical depth (more legally enforceable provisions in an agreement) matters more for provisions related to export taxes and providing information, such as publication on the internet of new laws and regulations related to customs. In contrast, the inclusion of most of the NTM provisions, with the exception of TBT, is not statistically significant for non-agricultural products. TBT includes rules for product weight, size, or packaging; ingredient or identity standards; shelf-life restrictions; and import testing and certification procedures that are necessary for both agricultural and non-agricultural products.

Regarding services (see Table A2.6), only inclusion of GATS and TRIPS provisions in agreements matters for agricultural products. In addition, when provisions related to state aid and public procurement are legally enforceable, trade in agricultural products increases by 13 percent and 45 percent. This is in line with the results of Guillin et al. (2023), who show that depth of service provisions matters.

For non-WTO-related provisions, their inclusion in trade agreements is generally not statistically significant. This finding reflects the fact that most African agreements either do not include such provisions or, when they are included, they are not legally enforceable. The few exceptions are, at the institutional level, competition policy and IPR that, when they are legally enforceable, do exert a positive and statistically significant impact on trade in agriculture. In terms of provisions related to production processes, while we were not able to show any significant impact because of legal enforceability, given that most of these provisions are just included without necessarily being enforceable. However, the inclusion of provisions related to investment, education, energy, research and development, and the movement of capital positively affect African agricultural exports. In contrast, provisions related to labor regulations are not statistically significant. This is in line with the results of Carrère et al. (2021) who find that the introduction of labor provisions does not exert an impact on bilateral trade flows (see Table A2.9). However, they might have a positive impact when institutionalized cooperation provisions are included. Moreover, labor provisions with strong enforcement mechanisms do not have a statistically significant impact on exports of developing countries in North–South preferential trade agreements. In theory, such provisions can make governments implement worker protection policies, raise labor standards, reduce informal employment, and so on.

Third, vertical depth matters more than horizontal depth. Indeed, to make the agreements effectively implementable, it is indispensable to guarantee their enforceability. Otherwise, they will remain shallow, with a focus just on tariff removal, which has been the case of most of the African RECs.

Table 2.1 Effects of aggregate provisions on African agricultural and non-agricultural exports

	Agriculture		Non-agriculture	
	Horizontal depth	Vertical depth	Horizontal depth	Vertical depth
WTO-plus	+	+	+	
Agriculture	+	+	+	+
NTMs	+	+		
Services				
WTO-X	+	+	+	+
Agriculture	n.a.	+	n.a.	+
Production processes	+	+	+	+
Institutions	+	+	+	
Regional coop.		+		

Significant | Insignificant

Source: Authors' construction.
Note: n.a. = not available; + = positive impact on trade; − = negative impact on trade.

Table 2.2 WTO-plus effect on African agricultural and non-agricultural exports

		Agriculture			Non-agriculture		
		Agreement without	Agreement with prov.	Agreement with prov. LE	Agreement without	Agreement with prov.	Agreement with prov. LE
Agriculture	FTA Agriculture	−	+	+	−	+	
NTMs	Customs	−	+	+	−		
	Export taxes	−		+	−		
	SPS	−	+				
	TBT	−	+		−		+
	Anti-dumping	−	+		−		
	CVM	−	+				
Services	State aid		−	+	−	+	
	Public procurement			+	−		
	TRIMs						+
	GATS		+				
	TRIPs		+				

Significant | Insignificant

Source: Authors' construction.
Note: n.a. = not available; + = positive impact on trade; − = negative impact on trade. Prov LE = provision with legal enforcement.

Table 2.3 WTO-X effect on African agriculture and non-agriculture exports

		Agriculture			Non-agriculture		
		Agreement without	Agreement with prov.	Agreement with prov. LE	Agreement without	Agreement with prov.	Agreement with prov. LE
Agri-related	Agriculture		+	n.a.	−		n.a.
	Health			n.a.			n.a.
Production	Investment	−	+		−		
	Labor market regulation						+
	Capital movement		−	+	−	+	
	Innovation policies		n.a.	n.a.		n.a.	n.a.
	Education & training		+	n.a.		+	n.a.
	Energy		+				
	Research & tech.		+	n.a.	−		n.a.
	SMEs			n.a.			n.a.
Institutions	Anti-corruption						+
	Competition policy			+	−		
	Environmental laws		+		−		+
	IPR			+	−		+
	Consumer protection		+	n.a.			n.a.
	Data protection			+			
	Human rights			n.a.			n.a.
	Information society	−	+				
	Social matters		+				+
	Statistics		+	n.a.			n.a.
Regional cooperation	Economic policy dialogue			n.a.			n.a.
	Financial assistance	−	+				
	Public administration			n.a.			n.a.
	Regional cooperation	−	+	n.a.			n.a.
	Taxation		−	n.a.		+	n.a.

Significant | Insignificant

Source: Authors' construction.
Note: n.a. = not available; + = positive impact on trade; − = negative impact on trade. Prov LE = provision with legal enforcement.

Conclusions and Outlook for the AfCFTA

This chapter analyzed the depth of African RTAs and assessed the implications for African trade in agricultural products. Starting with an overview of the evolution of RTAs involving African regions and countries, we find that the number of such RTAs has increased substantially over recent decades. Africa now has several FTAs operational under its various RECs and RTAs with European partners, the United States, and developing and emerging countries.

While the literature suggests that RTAs are crucial to boosting intraregional agricultural trade in Africa (Korinek and Melatos 2009; Makochekanwa 2012; Chawarika et al. 2022), it is important to have a close look at both the horizontal and vertical depth of these agreements. Our analysis of the horizontal depth of the agreements reveals substantial heterogeneity among African regions and countries and between Africa and the rest of the world. First, our findings suggest that almost all African RTAs provide good horizontal depth of WTO-plus provisions (tariffs, NTMs, and services), yet the inclusion of WTO-X provisions shows substantial heterogeneity. At the intra-African level, COMESA and EAC are horizontally deeper than the other RECs. Of the RTAs with extra-African partners, agreements involving the European Union provide better coverage of provisions than other African RTAs with the rest of the world. For vertical depth, the results are different. In general, agreements involving extraregional partners include a larger share of legally enforceable provisions compared to intra-African agreements. Moreover, the majority of these enforceable provisions are subject to dispute settlement. Thus, RTAs involving the EU are both horizontally and vertically deeper. At the intra-African level, COMESA and EAC are also the deepest agreements. However, RTAs among developing countries (such as the GSTP or the PTN) are among the shallowest.

The results from our empirical estimation suggest that Africa's RTAs do not exert a significant impact on its trade in agriculture. This could be attributed to the overall relative shallowness of most African agreements both at the continental and at the global level. The empirical results are also in line with the findings from the descriptive analysis, suggesting most African agreements (with the exception of COMESA, EAC, and EU-SADC) are horizontally shallower than those of other emerging country blocs such as CARICOM, the Pacific Alliance, and the EAEU. At the provisions level, however, we find that the horizontal depth of provisions related to agriculture liberalization is associated with more trade. For example, our results suggest that the inclusion of NTM provisions in the agreements is associated with a 20 to 26 percent increase in exports of agricultural products. These results are promising as they highlight the importance of including agriculture provisions in trade agreements. Indeed, such provisions are included in all 7 intra-African agreements and in 25 (out of 26) extra-African agreements to eliminate tariffs and NTMs on agriculture goods. Yet, what matters more for trade is the enforcement of these provisions. More importantly, our results suggest that institutions matter. While these are not directly trade-related, the enforcement of provisions related to the quality of institutions (such as anti-corruption practices, competition policy, environmental laws, intellectual property rights, consumer protection, data protection, human rights, and so on) is likely to significantly increase Africa's agricultural trade. We also find that the absence of specific provisions from RTAs may be trade diverting. Shallow RTAs are inherently discriminating as the resulting tariff concessions are likely to increase trade between members of the agreements (trade creation) but can also push members of the agreements to substitute imports previously sourced from non-members for those sourced from within the RTAs (trade diversion). Hence, the absence of provisions related to NTMs and several domestic policies such as state aid, competition policy, and investment policies would render the RTAs not deep enough to reduce trade costs and discrimination beyond tariff liberalization. In this case, it is more likely that the trade diversion

effect dominates the trade creation effect. Finally, we find that vertical depth matters. While the inclusion of provisions related to the agriculture sector is necessary, it might not be sufficient as these provisions need to be legally enforceable. Legal enforcement is likely to ensure the effective implementation of an agreement. This has been mainly shown in the empirical results for different WTO-X provisions related to institutions such as IPR, environmental laws, and social matters, for which the coefficients are significantly positive, implying the dominance of the trade creation effect.

Our analysis provides some insights into the future of the AfCFTA and its role in boosting African trade integration. In this regard, two points should be considered. The first is the agreement itself, including the status of negotiations and the content of the agreement. The second is the potential role of the AfCFTA in boosting agricultural trade.

The AfCFTA entered into force in 2019 after 24 African countries deposited their instruments of ratification. Fifty-four countries have now signed the consolidated text of the agreement establishing the AfCFTA, and as of February 2023, 46 of the 54 signatories (85.2 percent) had deposited their instruments of AfCFTA ratification. The negotiations are being conducted in two phases. The first phase addresses the core issues related to trade in goods and services; the second phase addresses broader trade-related issues, mainly IPRs, competition policy, and investment. While negotiations of the first phase are completed, the second phase is still underway due to delays and disruption during the COVID-19 pandemic.

The legal text of the AfCFTA agreement now has the main elements needed to assess its depth. The package of the consolidated legal documents is composed of: the framework agreement, the protocols on Trade in Goods, Trade in Services, Investment, Intellectual Property Rights, Competition Policy, Rules and Procedures on the Settlement of Disputes, and their associated Annexes and Appendices. Article 3 states that one of the general objectives of the agreement is to create a liberalized market for goods and services through successive rounds of negotiations and to facilitate the movement of persons in order to deepen the economic integration of the African continent. Article 4 presents the specific objectives that are deemed necessary for achieving the general ones, mainly to progressively eliminate tariffs and NTMs affecting trade in goods; to progressively liberalize trade in services; to cooperate on investment, IPRs, and competition policy; to cooperate on all trade-related areas such as customs matters and trade facilitation measures; to establish a dispute settlement mechanism concerning rights and obligations; and to establish and maintain an institutional framework for the implementation and administration of the agreement. Moreover, the annexes of the agreement protocols include WTO-plus and WTO-X provisions. The WTO-plus provisions are largely included in the protocols on trade in goods, where Annex 1 includes provisions on schedules of tariff concessions, whereas Annexes 3 to 9 include NTMs-related provisions. Also, services-related provisions such as TRIPS, TRIMS, and GATS are included in the protocols on trade in services. The WTO-X provisions are expected to be included in the annexes of the protocols on investment, competition, IPRs, and digital trade after the negotiations are completed.

Against this backdrop, two main shortcomings that could limit the effectiveness of the AfCFTA in boosting agricultural trade in Africa are worth mentioning. First, the AfCFTA agreement is seen primarily as a shallow agreement because it includes limited types of WTO provisions (limited horizontal depth). The agreement focuses only on the WTO-related provisions, specifically on the tariff liberalization concessions. Also, despite the presence of a protocol on a dispute settlement mechanism to solve disputes over countries' rights and obligations, there is

no mention of the legal commitments and enforceability at the provision level, that is, there is a lack of vertical depth in the agreement. This implies a potentially limited impact of the AfCFTA on intraregional agricultural trade, since this depends on the inclusion and legal enforcement of WTO-X provisions, especially those that are related to institutions, such as IPR, environmental laws, and social matters, as suggested by the results of the empirical model. Second, the level of ambition for achieving trade liberalization in agricultural products is considered very low. The modalities for tariff negotiations under the AfCFTA confirm that committed countries must reduce tariffs on 90 percent of their intraregional trade in goods within 5 years for non-least developed countries (LCDs) and 10 years for LDCs. Yet, a list of products is allowed to deviate from these binding commitments: Exceptions are made for sensitive products, which are allowed longer periods of implementation, and for some excluded products, which are not subject to tariff reductions. These sensitive and excluded products are primarily agricultural products, including live animals, meat, fish, milk and dairy products, fruit and vegetables, coffee, tea, spices, oilseeds and sugars. However, one positive sign is that this list is determined on a case-by-case basis, and is subject to notification and review in five years (UNCTAD 2020).

Hence, the absence of horizontal depth of provisions that may affect agriculture as well as their legal enforcement is likely to undermine the effectiveness of the AfCFTA. If the agreement focuses only on tariff reductions and NTMs are excluded from the negotiations, liberalization will be offset by the persistence of trade-impeding NTMs and behind-the-border policies. As Bouët and Sall (2021) note, harmonizing NTMs is a key issue for African countries' exports, both in terms of intra-African trade and Africa's trade relations with the rest of the world. In this regard, addressing NTMs (such as rules of origin or SPS measures) is likely to enhance intra-African trade in agriculture and foster the creation of regional value chains. This can be achieved either through harmonization or through mutual recognition among the members of the agreement. At the same time, the AfCFTA negotiations should also focus on improving the institutional quality of African countries, and on streamlining and harmonizing agriculture-relevant policies. Such reforms would provide strong support for the creation of one large continental market with increased food security and a larger global market share for agrifood. Finally, negotiating partners need to account for the fact that enhancing the horizontal and vertical depth of the AfCFTA agreement for agricultural trade is conditional on improving the product coverage and reducing the transition period for full liberalization of trade in agricultural products.

References

Aboushady, N., D. Roy, and C. Zaki. 2022. "The Three Great Stimulants: An Analysis of the Cocoa, Coffee, and Tea Value Chains." In *Africa Agriculture Trade Monitor 2022*, eds. A. Bouët, S.P. Odjo, and C. Zaki, 87–138. Kigali, Rwanda: AKADEMIYA2063; Washington, DC: International Food Policy Research Institute (IFPRI).

Abman, R., C. Lundberg, and M. Ruta. 2021. "The Effectiveness of Environmental Provisions in Regional Trade Agreements." Policy Research Working Paper No. 9601, World Bank, Washington, DC.

Anderson, J.E., and E. van Wincoop. 2003. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review* 93 (1): 170–192.

Baier, S.L., and J.H. Bergstrand. 2007. "Do Free Trade Agreements Actually Increase Members' International Trade?" *Journal of International Economics* 71 (1): 72–95.

Baier, S.L., Y.V. Yotov, and T. Zylkin. 2019. "On the Widely Differing Effects of Free Trade Agreements: Lessons from Twenty Years of Trade Integration." *Journal of International Economics* 116: 206–226.

Balogh, J.M, and N.C. Leitão. 2019. "A Gravity Approach of Agricultural Trade: The nexus of the EU and African, Caribbean and Pacific Countries." *Agricultural Economics–Czech* 65 (11): 509–519.

Bhagwati, J. 1995. "US Trade Policy: The Infatuations with FTAs." In *The Dangerous Obsession With Free Trade Areas*, ed. C. Barfield. Washington, DC: American Entreprise Institute.

Bouët, A., A. Elbehri, D.B. Nguyen, and F. Traore. 2022. "Measuring Agricultural Trade Integration in Southeast Asia." *Journal of Economic Integration* 37 (2): 235–266.

Bouët, A., and L.M. Sall. 2021. "African Participation in Global Agricultural Trade." In *Africa Agriculture Trade Monitor 2021*, eds. A. Bouët, G. Tadesse, and C. Zaki, 15–49. Kigali: AKADEMIYA2063; Washington, DC: IFPRI.

Breinlich, H., V. Corradi, N. Rocha, M. Ruta, J.M.C. Santos Silva, and T. Zylkin. 2021. "Using Machine Learning to Assess the Impact of Deep Trade Agreements." In *The Economics of Deep Trade Agreements*, eds. A.M. Fernandes, N. Rocha, and M. Ruta, 25–36. London: CEPR Press.

Carrère, C., M. Olarreaga, and D. Raess. 2022. "Labor Clauses in Trade Agreements: Hidden Protectionism?" *Review of International Organizations* 17: 453–483.

Chawarika, A., F. Madzokere, and A. Murimbika. 2022. "Regional Trade Agreements and Agricultural Trade: An Analysis of Zimbabwe's Agricultural Trade Flows." *Cogent Economics & Finance* 10 (1): 2048482.

European Commission (EC). 2016. *Impacts of EU Trade Agreements on the Agricultural Sector*. Copenhagen: Copenhagen Economics.

Evenett, S.J., and W. Keller. 2002 "On Theories Explaining the Success of the Gravity Equation." *Journal of Political Economy* 110: 281–316.

Fadeyi, O.A., T.Y. Bahta, A.A. Ogundeji, and B.J. Willemse. 2014. "Impacts of the SADC Free Trade Agreement on South African Agricultural Trade." *Outlook on Agriculture* 43 (1): 53–59.

Fernandes, A.M., N. Rocha, and M. Ruta. 2021. "Introduction: The Economics of Deep Trade Agreements." In *The Economics of Deep Trade Agreements*, eds. A.M. Fernandes, N. Rocha, and M. Ruta, 1–7. London: CEPR Press.

Feenstra, R. 2002. "Border Effects and the Gravity Equation: Consistent Methods for Estimation." *Scottish Journal of Political Economy* 49 (5).

Fontagné, L., N. Rocha, M. Ruta, and G. Santoni,. 2021. "Quantifying the Impact of Deep Trade Agreements: A General Equilibrium Approach." In *The Economics of Deep Trade Agreements*, ed. A.M. Fernandes, N. Rocha, and M. Ruta., 19–34. London: Centre for Economic Policy Research (CEPR) Press, World Bank Group.

Fulponi, L., M. Shearer, and J. Almeida. 2011. "Regional Trade Agreements - Treatment of Agriculture." OECD Food, Agriculture and Fisheries Working Papers No. 44. Organisation for Economic Co-operation and Development (OECD), Paris.

Guillin, A., I. Rabaud, and C. Zaki. 2023. "Does the Depth of Trade Agreements Matter for Trade in Services?" *The World Economy* (forthcoming).

Goundan, A., and G. Tadesse. 2021. "Intra-African Agricultural Trade." In *Africa Agriculture Trade Monitor 2021*, eds. A. Bouët, G. Tadesse, and C. Zaki, 51–83. Kigali, Rwanda: AKADEMIYA2063; Washington, DC: IFPRI.

Goundan, A., L.M. Sall, J. Collins, and J.W. Glauber. 2022. "Intra-African Agricultural Trade." In *Africa Agriculture Trade Monitor 2022*, eds. A Bouët, S.P. Odjo, and C. Zaki, 45–86. Kigali, Rwanda: AKADEMIYA2063; Washington, DC: IFPRI.

Hofmann, C., A. Osnago, and M. Ruta. 2017. "Horizontal Depth: A New Database on the Content of Preferential Trade Agreements." World Bank Policy Research Working Paper 7981. World Bank, Washington, DC..

Karam, F., and C. Zaki. 2019. "Why Can't MENA Countries Trade More? The Curse of Bad Institutions." *Quarterly Review of Economics and Finance* 73: 56–77.

Korinek, J., and M. Melatos. 2009. "Trade Impacts of Selected Regional Trade Agreements in Agriculture." OECD Trade Policy Papers No. 87. OECD Publishing, Paris.

Kloewer, B. 2016. "The Spaghetti Bowl of Preferential Trade Agreements and the Declining Relevance of the WTO." *Denver Journal of International Law and Policy* 44 (3): 429–440.

McCallum, J. 1995. "National Borders Matter: Canada-U.S. Regional Trade Patterns," *American Economic Review* 83 (2): 615–62.

Makochekanwa, A. 2012. "Impacts of Regional Trade Agreements on Trade in Agrifood." Paper submitted to the African Economic Conference 2012, October 30–November 2, Kigali.

Manu, C. 2021. "The Impact of Trade Agreement on Agricultural Trade Flow in West Africa." *International Journal of Economics and Finance* 13 (1): 1–89.

Mattoo, A, N. Rocha, and M. Ruta. 2020. *Handbook of Deep Trade Agreements*. Washington, DC: World Bank.

Mattoo, A., A. Mulabdic, and M. Ruta. 2017. "Trade Creation and Trade Diversion in Deep Agreements." Policy Research Working Paper No. 8206. World Bank, Washington, DC.

Olayiwola, K.W, E.S. Osabuohien, H. Okodua, and O. Ola-David. 2015. "Economic Integration, Trade Facilitation and Agricultural Exports Performance in ECOWAS Sub-Region." In *Regional Integration and Trade in Africa,* eds. M. Ncube, I. Faye, and A. Verdier-Chouchane, 31–46. New York: Palgrave Macmillan.

Santos Silva, J.M.C., and S. Tenreyro. 2011. "Further Simulation Evidence on the Performance of the Poisson Pseudo-maximum Likelihood Estimator." *Economics Letters* 112 (2): 220–222.

Sunge, R., and N. Ngepah. 2020. "Agricultural Trade Liberalization, Regional Trade Agreements and Agricultural Technical Efficiency in Africa." *Outlook on Agriculture* 49 (1): 66–76.

Thompson-Lipponen, C., and J. Greenville. 2019. "The Evolution of the Treatment of Agriculture in Preferential Trade Agreements." OECD Food, Agriculture and Fisheries Papers, No. 126. OECD Publishing, Paris.

UNCTAD (United Nations Conference on Trade and Development). 2020. *Designing Trade Liberalization in Africa: Modalities for Tariffs Negotiations Towards an African Continental Free Trade Area*. Geneva.

UNECA (United Nations Economic Commission for Africa). 2019. *Next Steps for the African Continental Free Trade Area:* Assessing Regional Integration in Africa | ARIA IX. Addis Ababa.

UNCTAD and COMESA (Common Market for Eastern and Southern Africa). 2023. *The Utilisation of Trade Preferences By COMESA Member States: Intra-Regional Trade and North South Trade*. Geneva: UNCTAD; Lusaka: COMESA.

World Bank. 2023. World Bank Deep Trade Agreements database. Accessed March 6, 2023. https://datatopics.worldbank.org/dta/table.html

WTO (World Trade Organizaton). 2023. WTO Regional Trade Agreements database. https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx.

Yildirim, A., and F.M. Gokalp. 2016. "Institutions and Economic Performance: A Review on the Developing Countries." In *Proceedings of the Istanbul Conference of Economics and Finance*, October 22–23, 2015, Istanbul.

Appendix

Table A2.1 List of African intra- and extraregional agreements

Intraregional agreements
Common Market for Eastern and Southern Africa (COMESA)
Economic and Monetary Community of Central Africa (CEMAC)
East African Community (EAC)
West African Economic and Monetary Unit (WAEMU)
Economic Community of West African States (ECOWAS)
Southern African Customs Union (SACU)
South African Development Community (SADC)
Extraregional agreements
Agadir Agreement
Global System of Trade Preferences (GSTP)
EC–Algeria
EC–Cameroon
EC–Côte d'Ivoire
EC–Egypt
EC–South Africa
EC–Morocco
EC–Tunisia
EU–SADC
EU–Ghana
EU–Eastern and Southern Africa States Interim (ESA)
EFTA–Egypt
EFTA–Morocco
EFTA–SACU
EFTA–Tunisia
Egypt–Türkiye
Mauritius–Pakistan
Pan-Arab Free Trade Area (PAFTA)
Protocol on Trade Negotiations (PTN)
Southern Common Market (MERCOSUR)–SACU
Southern Common Market (MERCOSUR)–Egypt
Türkiye Mauritius
Türkiye–Morocco
Türkiye–Tunisia
US–Morocco

Source: Based on data availability from World Bank Deep Trade Agreements database.

Table A2.2 List of provisions

	WTO-plus areas	
Tariffs	FTA agriculture	Tariff liberalization on agriculture goods; elimination of nontariff measures
NTMs	Customs	Provision of information; publication on the Internet of new laws and regulations; training
	Export taxes	Elimination of export taxes
	SPS	Affirmation of rights and obligations under the WTO Agreement on SPS; harmonization of SPS measures
	TBT	Affirmation of rights and obligations under WTO Agreement on TBT; provision of information; harmonization of regulations; mutual recognition agreements
	Anti-dumping	Retention of anti-dumping rights and obligations under the WTO Agreement (Art. VI GATT).
	CVM	Retention of countervailing measures rights and obligations under the WTO Agreement (Art VI GATT)
Services	State aid	Assessment of anticompetitive behavior; annual reporting on the value and distribution of state aid given; provision of information
	Public procurement	Progressive liberalization; national treatment and/or non-discrimination principle; publication of laws and regulations on the internet; specification of public procurement regime
	TRIMs	Provisions concerning requirements for local content and export performance of foreign direct investment
	GATS	Liberalization of trade in services
	TRIPs	Harmonization of standards; enforcement; national treatment, most-favored nation treatment
	WTO-X areas	
Agriculture	Agriculture	Technical assistance to conduct modernization projects; exchange of information
	Health	Monitoring of diseases; development of health information systems; exchange of information
Institutions	Anti-corruption	Regulations concerning criminal offense measures in matters affecting international trade and investment
	Competition policy	Maintenance of measures to proscribe anticompetitive business conduct; harmonization of competition laws; establishment or maintenance of an independent competition authority
	Environmental laws	Development of environmental standards; enforcement of national environmental laws; establishment of sanctions for violation of environmental laws; publications of laws and regulation
	Intellectual property rights	Accession to international treaties not referenced in the TRIPs Agreement
	Consumer protection	Harmonization of consumer protection laws; exchange of information and experts; training
	Data protection	Exchange of information and experts; joint projects
	Human rights	Respect for human rights
	Information society	Exchange of information; dissemination of new technologies; training
	Social matters	Coordination of social security systems; non-discrimination regarding working conditions
	Statistics	Harmonization and/or development of statistical methods; training

	WTO-X areas	
Production process	Investment	Information exchange; development of legal frameworks; harmonization and simplification of procedures; national treatment; establishment of mechanism for the settlement of disputes
	Labor market Regulation	Regulation of the national labor market; affirmation of International Labor Organization (ILO) commitments; enforcement
	Movement of capital	Liberalization of capital movement; prohibition of new restrictions
	Innovation policies	Participation in framework programs; promotion of technology transfers
	Education & training	Measures to improve the general level of education
	Energy	Exchange of information; technology transfer; joint studies
	Research & technology	Joint research projects; exchange of researchers; development of public-private partnerships
	SMEs	Technical assistance; facilitation of the access to finance
Regional cooperation	Economic policy dialogue	Exchange of ideas and opinions; joint studies
	Financial assistance	Set of rules guiding the granting and administration of financial assistance
	Public administration	Technical assistance; exchange of information; joint projects; training
	Regional cooperation	Promotion of regional cooperation; technical assistance programs
	Taxation	Assistance in conducting fiscal system reforms

Empirical results

Table A2.3 Horizontal and vertical depth—group of provisions

	Agriculture		Non-agriculture	
	Horizontal depth	Vertical depth	Horizontal depth	Vertical depth
WTO-Plus	1.0697***	0.0722***	0.7369*	0.0273
	(0.403)	(0.019)	(0.414)	(0.027)
Agriculture	11.2358***	2.6261***	7.0745**	5.5114***
	(2.714)	(0.833)	(3.134)	(0.614)
NTMs	1.5872**	0.0814***	1.1149	0.0142
	(0.671)	(0.021)	(0.688)	(0.033)
Services	1.3839	0.0640	2.1368	0.0904
	(1.072)	(0.055)	(1.352)	(0.060)
WTO-X	2.6639***	0.0139***	2.1312**	0.0075*
	(0.896)	(0.005)	(0.835)	(0.005)
Agriculture		0.0827***		0.0722*
		(0.030)		(0.040)
Production process	6.2277***	0.0355***	5.5892**	0.0308**
	(2.021)	(0.012)	(2.267)	(0.015)
Institutions	4.1521***	0.0304**	3.3704***	0.0140
	(1.575)	(0.013)	(1.247)	(0.010)
Regional cooperation	2.5994	0.0748***	-1.5778	0.0279
	(2.200)	(0.022)	(3.253)	(0.025)
Observations	340,528	340,528	1,047,050	1,047,050

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) Errors are clustered at the bilateral level. (v) Agriculture is included twice (one for provisions related to WTO plus and the other WTOX).

Table A2.4 Vertical Depth – Individual Provisions – WTO-Plus – Agriculture

	FTA Agriculture	
	Agri.	Non-Agri
Agreement w/o prov.	-1.0395***	-0.5681***
	(0.176)	(0.131)
Agreement with prov.	1.5874*	4.9426***
	(0.852)	(0.629)
Agreement with prov. LE	0.0879**	-0.0094
	(0.044)	(0.060)

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

Table A2.5 Vertical Depth – Individual Provisions – WTO-Plus – NTMs

	Agriculture					
	Customs	Export Taxes	SPS	TBT	AD	CVM
Agreement w/o prov.	-0.3972***	-0.2265***	-0.1157**	-0.3193***	-0.3101***	-0.3645***
	(0.110)	(0.083)	(0.048)	(0.084)	(0.082)	(0.101)
Agreement with prov.	0.2104**	0.1124	0.2349***	0.1927***	0.2070***	0.2144***
	(0.102)	(0.086)	(0.079)	(0.067)	(0.073)	(0.068)
Agreement with prov. LE	0.1410**	0.0945*	0.0571	0.0344	-0.0093	0.0521
	(0.056)	(0.050)	(0.109)	(0.121)	(0.045)	(0.051)
	Non-agriculture					
	Customs	Export Taxes	SPS	TBT	AD	CVM
Agreement w/o prov.	-0.4093***	-0.2089**	-0.0552	-0.2649**	-0.3539***	-0.2165
	(0.124)	(0.104)	(0.047)	(0.107)	(0.105)	(0.133)
Agreement with prov.	-0.0368	0.1238	0.0202	0.0220	0.0762	-0.0330
	(0.127)	(0.123)	(0.132)	(0.069)	(0.148)	(0.117)
Agreement with prov. LE	0.0095	-0.0137	0.0530	0.2995**	-0.0160	0.0246
	(0.063)	(0.061)	(0.209)	(0.144)	(0.053)	(0.055)

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

Table A2.6 Vertical Depth – Individual Provisions – WTO-Plus – Services

	Agriculture				
	State Aid	Public Procurement	TRIMs	GATS	TRIPs
Agreement w/o prov.	-0.0177	-0.0230	0.0237	0.0070	0.0059
	(0.050)	(0.055)	(0.040)	(0.039)	(0.048)
Agreement with prov.	-0.8294***	0.0437	-0.1238	0.2265*	0.4510*
	(0.251)	(0.057)	(0.090)	(0.122)	(0.253)
Agreement with prov. LE	0.1278**	0.4006*	-0.0282	-0.0142	0.0021
	(0.052)	(0.219)	(0.074)	(0.071)	(0.044)
	Non-agriculture				
	State Aid	Public Procurement	TRIMs	GATS	TRIPs
Agreement w/o prov.	-0.2697**	-0.3852***	-0.0493	-0.0883	-0.1194
	(0.105)	(0.116)	(0.061)	(0.058)	(0.089)
Agreement with prov.	1.6103***	0.0550	-0.2065	0.1423	-0.2709
	(0.259)	(0.066)	(0.132)	(0.188)	(0.266)
Agreement with prov. LE	0.0331	0.0454	0.6905***	0.0501	0.0223
	(0.051)	(0.246)	(0.161)	(0.084)	(0.065)

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

Table A2.7 Vertical Depth – Individual Provisions – WTO-X – Agriculture

	Agriculture		Health	
	Agri.	Non-Agri	Agri.	Non-Agri
Agreement w/o prov.	-0.0295	-0.1940**	0.0088	-0.0332
	(0.047)	(0.098)	(0.042)	(0.074)
Agreement with prov.	0.1080**	0.0505	0.1172	-0.0395
	(0.044)	(0.058)	(0.071)	(0.063)

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

Table A2.8 Vertical Depth – Individual Provisions – WTO-X – Institutions

	Agriculture				
	Anti-Corruption	Competition Policy	Environmental Laws	IPR	Consumer Protection
Agreement w/o prov.	0.0234	-0.0429	-0.0174	-0.0128	0.0098
	(0.040)	(0.049)	(0.050)	(0.052)	(0.046)
Agreement with prov.	0.1760	0.1740	0.0902**	0.0580	0.0777**
	(0.208)	(0.125)	(0.043)	(0.042)	(0.039)
Agreement with prov. LE	-0.0283	0.1372***	-0.0281	0.1457**	
	(0.075)	(0.053)	(0.076)	(0.069)	
	Non-agriculture				
	Anti-Corruption	Competition Policy	Environmental Laws	IPR	Consumer Protection
Agreement w/o prov.	-0.0787	-0.2759***	-0.2030*	-0.2109*	-0.1279
	(0.068)	(0.102)	(0.105)	(0.119)	(0.097)
Agreement with prov.	0.2271	-0.0852	0.0329	-0.0311	0.0714
	(0.140)	(0.142)	(0.054)	(0.064)	(0.069)
Agreement with prov. LE	0.6633***	0.0565	0.6627***	0.1388*	
	(0.165)	(0.065)	(0.164)	(0.074)	

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

Table A2.8 Vertical Depth – Individual Provisions – WTO-X – Institutions (continued)

Agriculture					
	Data Protection	Human Rights	Information Society	Social Matters	Statistics
Agreement w/o prov.	-0.0014	0.0018	-0.2097***	-0.0165	-0.0184
	(0.044)	(0.048)	(0.068)	(0.046)	(0.047)
Agreement with prov.	0.0489	0.0779	0.1175**	0.0914*	0.1295**
	(0.042)	(0.052)	(0.052)	(0.048)	(0.052)
Agreement with prov. LE	0.4195*		0.0878	0.2057	
	(0.231)		(0.155)	(0.143)	
Non-agriculture					
	Data Protection	Human Rights	Information Society	Social Matters	Statistics
Agreement w/o prov.	-0.0803	-0.1646	-0.1134	-0.1604	-0.1521
	(0.088)	(0.104)	(0.101)	(0.101)	(0.100)
Agreement with prov.	-0.0364	0.0491	0.0074	-0.0353	0.0409
	(0.064)	(0.055)	(0.060)	(0.057)	(0.055)
Agreement with prov. LE	0.1473		-0.1140	0.1737*	
	(0.125)		(0.170)	(0.090)	

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

Table A2.9 Vertical Depth – Individual Provisions – WTO-X – Production Process

Agriculture				
	Investment	Labour Market Regulation	Movement of Capital	Innovation Policies
Agreement w/o prov.	-0.1761***	0.0231	-0.0513	0.0227
	(0.067)	(0.040)	(0.052)	(0.039)
Agreement with prov.	0.0970*	0.1996	-0.5481**	
	(0.050)	(0.128)	(0.243)	
Agreement with prov. LE	0.0898	-0.0281	0.1834***	
	(0.138)	(0.075)	(0.064)	
Non-agriculture				
	Investment	Labor Market Regulation	Movement of Capital	Innovation Policies
Agreement w/o prov.	-0.2848***	-0.0493	-0.3126***	-0.0349
	(0.102)	(0.061)	(0.098)	(0.061)
Agreement with prov.	0.0169	-0.0997	1.1915***	
	(0.062)	(0.182)	(0.420)	
Agreement with prov. LE	-0.0473	0.6904***	0.0272	
	(0.209)	(0.161)	(0.052)	

Table A2.9 Vertical Depth – Individual Provisions – WTO-X – Production Process (continued)

	Agriculture			
	Education and Training	Energy	Research and Technology	SME
Agreement w/o prov.	0.0016	-0.0243	-0.0121	0.0242
	(0.042)	(0.051)	(0.046)	(0.046)
Agreement with prov.	0.1438**	0.1006**	0.1152**	0.0177
	(0.058)	(0.046)	(0.047)	(0.060)
Agreement with prov. LE		0.0295		
		(0.090)		
	Non-agriculture			
	Education and Training	Energy	Research and Technology	SME
Agreement w/o prov.	-0.1127	-0.1838	-0.1720*	-0.0319
	(0.079)	(0.114)	(0.101)	(0.081)
Agreement with prov.	0.1206*	0.0492	0.0542	-0.0416
	(0.066)	(0.054)	(0.056)	(0.060)
Agreement with prov. LE		-0.0238		
		(0.156)		

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

Table A2.10 Vertical Depth – Individual Provisions – WTO-X – Regional Cooperation

	Agriculture				
	Economic Policy Dialogue	Financial Assistance	Public Administration	Regional Cooperation	Taxation
Agreement w/o prov.	0.0134	-0.2143***	0.0288	-0.3145***	0.0284
	(0.040)	(0.072)	(0.044)	(0.086)	(0.039)
Agreement with prov.	0.0873	0.1506**	-0.0192	0.1377**	-0.5278**
	(0.066)	(0.062)	(0.090)	(0.054)	(0.231)
Agreement with prov. LE		0.0457			
		(0.041)			
	Non-agriculture				
	Economic Policy Dialogue	Financial Assistance	Public Administration	Regional Cooperation	Taxation
Agreement w/o prov.	-0.0298	-0.1413	-0.0352	-0.1807	-0.0738
	(0.061)	(0.122)	(0.076)	(0.136)	(0.054)
Agreement with prov.	-0.0828	0.0358	-0.0341	-0.0019	1.1809***
	(0.096)	(0.072)	(0.061)	(0.058)	(0.398)
Agreement with prov. LE		-0.0327			
		(0.063)			

Note: (i) Robust standard errors in parentheses. (ii) *** p<0.01, ** p<0.05, * p<0.1. (iii) All regressions include a constant, exporter-time, importer-time, bilateral and product fixed effects. (iv) The number of observations is 340,528 for agricultural products and 1,047,050 for non-agricultural products. (v) Errors are clustered at the bilateral level.

CHAPTER
THREE

Intra-African Agricultural Trade: Recent Trends and Nutritional Content

Elsa Olivetti, Julia Collins, Sunday Odjo, and David Laborde

Introduction

Increasing intra-African trade has long been an important development objective. The free movement of goods, services, factors of production, and people is seen as a key outcome of the African Union's Agenda 2063, which expresses broad goals and aspirations for development and political and economic integration on the continent. The 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods includes tripling intra-African agricultural trade by 2025 as one of seven major commitments. The African Continental Free Trade Area (AfCFTA), launched in January 2021, seeks to increase intra-African trade in order to boost industrial and socioeconomic development. With several important areas of the AfCFTA Agreement, including rules of origin, still under negotiation as of early 2023, the African Union adopted "Year of AfCFTA: Acceleration of the African Continental Free Trade Area Implementation" as its theme for 2023 in an effort to increase attention and commitment to the AfCFTA.

Increased intra-African trade can provide a myriad of benefits. In addition to promoting economic growth through broader market access, trade also has clear potential to improve food security by increasing availability of and access to food through a variety of channels. Potentially, the most important avenue to greater food security is increased incomes resulting from trade, which boost consumers' purchasing power and permit them to consume more, and more nutritious food (Adjaye-Gbewonyo et al. 2019; Shankar 2017). Trade also contributes to greater supplies of food in national markets (Bonuedi, Kamasa, and Opoku 2020). Intra-African trade shows strong potential to reduce volatility of food supply and prices and increase resilience to production shocks, as regional production tends to be more stable than national production (Minot 2014; Odjo and Badiane 2018; Makochekanwa and Matchaya 2019).

In addition to increasing the availability of and access to food, trade can also affect nutrition by influencing the quality of diets. Importantly, trade can increase dietary diversity, which is associated with greater nutrient intake adequacy (Ruel 2003; Dithmer and Abdulai 2017). Many African countries face a triple burden of nutrition, in which persistent undernutrition issues occur alongside increasing prevalence of overweight, obesity, and diet-related noncommunicable diseases (NCDs) as well as micronutrient deficiencies, known as hidden hunger, stemming from inadequate intake and absorption of vitamins and minerals. Although the exact prevalence of most micronutrient deficiencies is unknown, they are estimated to be widespread throughout the continent, causing serious health issues as well as impeding human growth and development. Muthayya et al. (2013) estimate global disease burdens related to iron, vitamin A, and zinc deficiencies and suggest that 29 of the 30 countries with the highest burdens were African.

Several studies at the global level have examined the nutritional content of trade patterns to investigate the potential of trade to improve diet quality and address micronutrient deficiencies by redistributing nutrients from surplus to deficit regions. Wood et al. (2018) find that international trade plays an important role in meeting micronutrient needs in low- and middle-income countries. Ge et al. (2021) suggest that increasing global trade would contribute to meeting nutrient needs in Africa and other regions. There are limits, however, to the ability of trade to fill nutrient gaps: Geyik et al. (2021) find that low-income countries with inadequate production of micronutrients are generally able to increase supplies through trade only moderately, and not sufficiently to meet national requirements. However, intra-African trade does contribute noticeably to nutrient supplies: most low-income countries in sub-Saharan Africa obtain a third or more of their supplies of vitamins A and B6 from intra-

African imports (Geyik et al. 2021). Trade can also increase micronutrient supplies by boosting access to industrially fortified foods as well as to the knowledge and technology required for fortification (EEFS 2021).

However, trade can have negative impacts on nutrition if it spurs increased consumption of foods poor in vitamins and minerals and/or rich in fats, sugar, and salt—substances associated with increased risk of NCDs. Many authors have suggested that increased global trade—as well as other aspects of globalization such as increased foreign direct investment—are associated with such dietary changes (often termed the nutrition transition) (Hawkes, Chopra, and Friel 2009; Thow 2009). Trade can contribute to the nutrition transition in multiple ways. In addition to increasing the availability of ultra-processed foods and foods of poor nutritional quality, trade and related investments and advertising can shift consumer preferences toward such foods and replace local foods with less nutritious substitutes (Shankar 2017; Hawkes 2015).

Overall, increased trade tends to increase access to food in general. This can improve dietary diversity and boost consumption of nutritious foods but can also increase consumption of foods high in fats, sugar, and salt. Thus, trade can reduce undernutrition, including hidden hunger, but can also exacerbate overnutrition (Shankar 2017).

This chapter reviews the performance and trends in intra-African agricultural trade with a focus on the nutritional content of trade. It examines trends over time; patterns among countries and regional economic communities (RECs); and major traded products, both in value and nutritional content terms. The analysis also disaggregates trade flows into unprocessed, semi-processed, and highly processed categories in order to examine the role of processed products in agricultural trade. Semi-processed and highly processed products are growing in importance in intra-African trade, and further boosting this trade has been identified as a potential vehicle to increase value addition, agricultural incomes, and overall industrial and economic development. However, trade in processed foods has also been implicated as a potential contributor to dietary changes associated with increased risk of NCDs. Given the evolution of trade and diets and the potential mixed contributions of trade to nutrition, it is important to examine the nutritional content of Africa's trade in detail. The assessment offered in this chapter can serve as a baseline for tracking changes in nutritional content over time, as a complement to efforts to track evolution in the value of trade.

The remainder of the chapter is organized as follows. In the next section, we review trends in intra-African agricultural trade in terms of value, at the continental, regional economic community (REC), and country levels. The following section examines the nutritional content of Africa's agricultural trade. The analysis expresses trade flows in terms of calories, proteins, fats, and key micronutrients; reviews trends over time and among RECs; and contrasts trends in Africa's global trade and intra-African trade in nutrient terms. This analysis is followed by a discussion on food safety and broader sanitary and phytosanitary (SPS) systems, an important policy issue affecting the ability of intra-African trade to contribute to healthy and nutritious diets. The final section concludes.

Trends in Intra-African Agricultural Trade

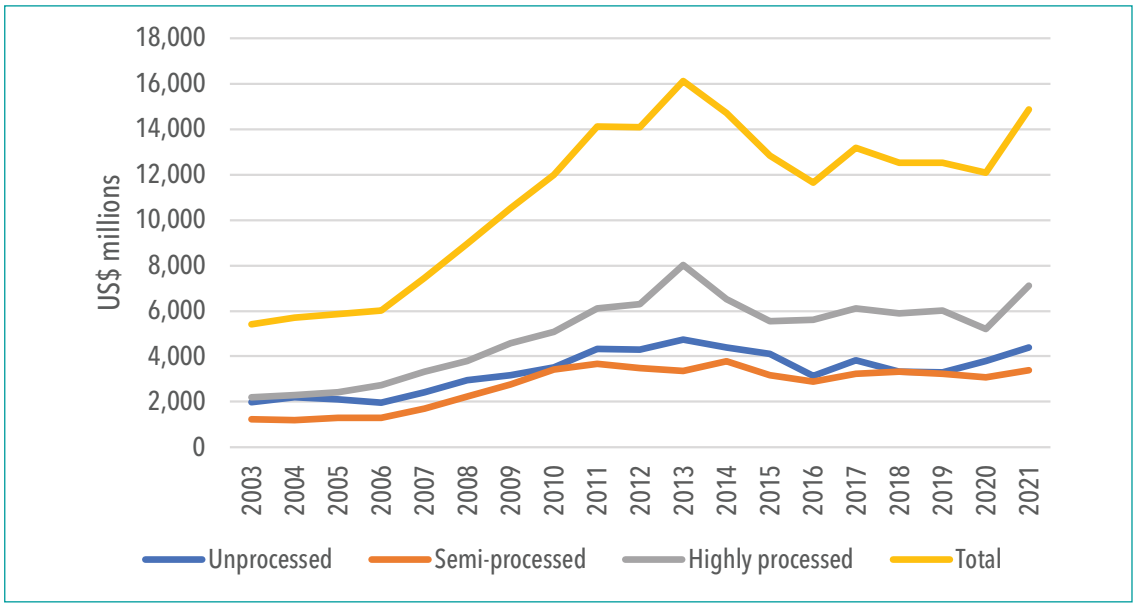
In this section, we provide an overview of trends in intra-African agricultural trade at the continental, REC, and country levels. We explore trade patterns in terms of value as a backdrop for the subsequent discussion of trade in terms of nutritional content. Trade is disaggregated by level of processing to highlight the role of trade in processed products, which represents an important and growing category of intra-African agricultural trade.

It is important to note that all trade values represent recorded (formal) trade only and do not include informal trade. Thus, the trade trends reviewed here present an informative but incomplete picture of intra-African trade. The magnitude of informal cross-border trade in Africa is unknown, but several studies suggest that it is significant. Observational studies on informal cross-border trade in several regions of Africa summarized in Bouët, Cissé, and Traoré (2020) indicate that informal trade may account for 10 to 60 percent of total trade flows, depending on the region. The prevalence of informal trade is likely to be especially high for agricultural trade. Therefore, the statistics described in this chapter are expected to underestimate actual intra-African agricultural trade.

Intra-African agricultural trade trends by processing category

Figure 3.1 presents the evolution of intra-African agricultural trade between 2003 and 2021 in terms of product processing levels.[1] Total intra-African agricultural trade rose sharply in the second half of the 2000s and early 2010s, peaking in 2013 at a value of US$16.1 billion before declining to $11.6 billion in 2016. The level of trade stagnated for several years before rising to $14.9 billion in 2021. This pattern reflects evolution in the global FAO Food Price Index, which declined for several years following a peak in 2011, rising moderately after 2016 and more rapidly in 2020–2021 (Cissé, Kurtz, and Odjo 2020; FAO 2023b). The limited growth in trade since the mid-2010s is reflected by uneven performance on the Malabo Declaration commitment to boost intra-African agricultural trade (see Box 3.1).

Figure 3.1 Intra-African agricultural exports by processing level, 2003–2021



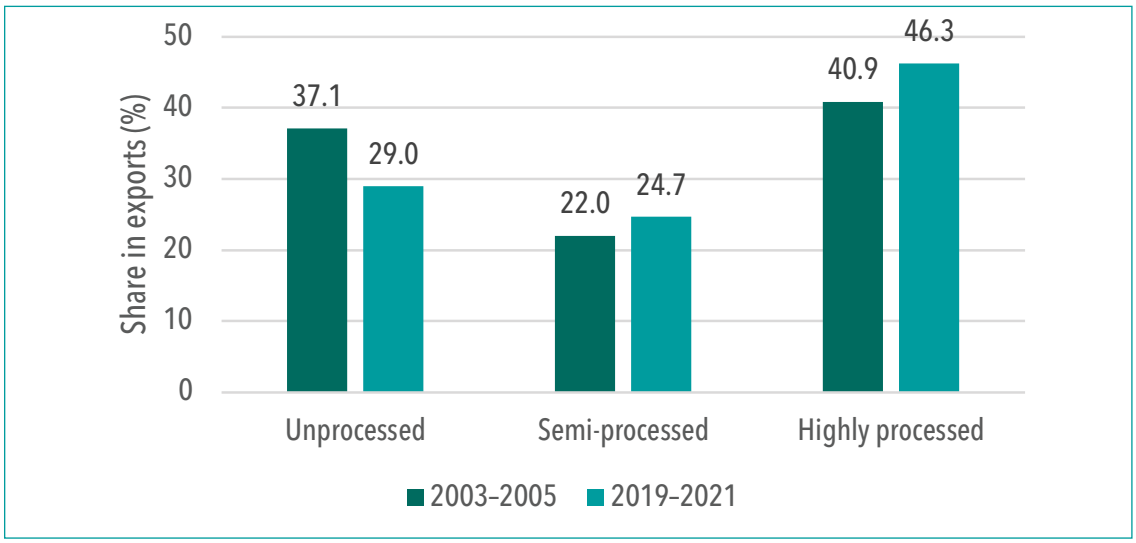
Source: Authors based on the 2023 AATM database.

Throughout most of the 2003–2021 period, highly processed products comprised larger shares of intra-African trade by value than unprocessed or semi-processed products, and this share rose throughout the period from 40.9 percent in 2003–2005 to 46.3 percent in 2019–2021 (Figure 3.2). The share of semi-processed products also rose moderately, while the share of unprocessed products declined from 37.1 percent to 29.0 percent over the same period. The changing shares of different processing categories reflect dietary changes documented during this period, with processed foods accounting for a growing share of African diets (Hollinger

1 Traded agricultural products were categorized at the HS6 level as unprocessed, semi-processed, or highly processed following the classification by Bouët and Sall (2021).

and Staatz 2015; Hassen et al. 2016; Badiane et al. 2022). These trends are likely to accelerate in the future, driven by the growing urban demand for processed food products, which results from income growth and rapid urbanization.

Figure 3.2 Share of processing categories in intra-African agricultural exports



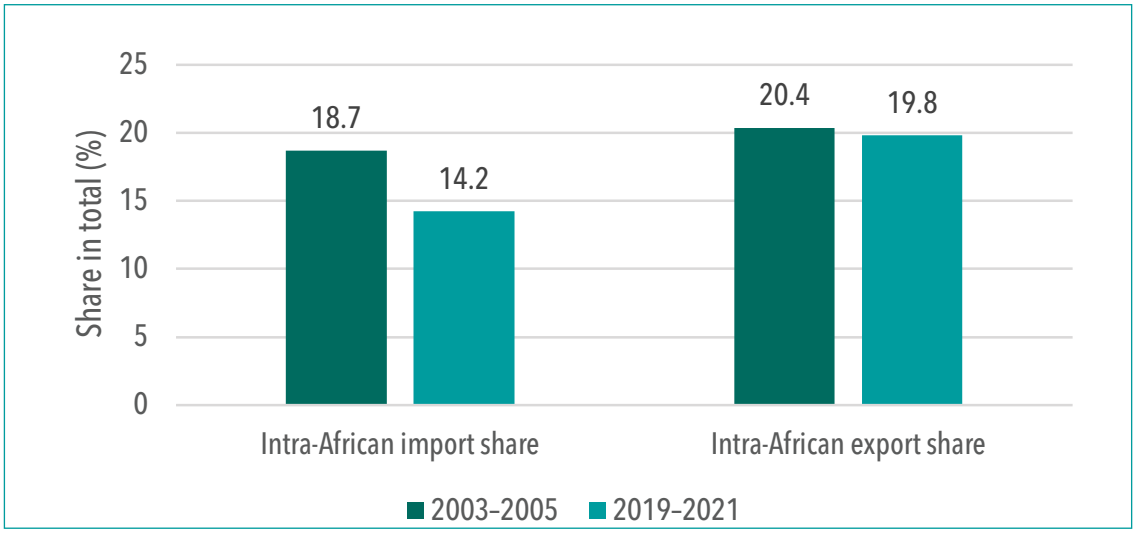
Source: Authors based on the 2023 AATM database.

Box 3.1. Progress toward the Malabo Declaration commitment to boost intra-African agricultural trade

Commitment 5 of the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods calls for African countries to triple the level of intra-African trade in agricultural goods and services by 2025. Since the Declaration, three continental Biennial Reviews have taken place to track progress toward the commitments made. Progress on commitment 5 is measured through two performance categories, one tracking changes in the value of intra-African agricultural trade and the other assessing policies and institutional conditions, as expressed through indicators measuring the quality of infrastructure, ease of border administration procedures, and food price volatility, among other factors (AUC and AUDA-NEPAD 2021). During each Biennial Review, progress under the commitment is assessed against benchmark values representing expected milestones to be achieved prior to the final 2025 targets. At the time of the first Biennial Review in 2017, Africa as a whole met the benchmark and was assessed as "on track" to achieving commitment 5; however, the continent was "off track" during the second and third Biennial Reviews in 2019 and 2021 (AU 2023). In 2019, Africa's overall score was higher than that of 2017, although below the new benchmark, but by 2021 the continent had regressed, showing worse performance than in the previous Biennial Review under both performance categories. Some of this regression may result from negative impacts of the COVID-19 pandemic on intra-African trade (AUC and AUDA-NEPAD 2022).

Intra-African trade represents a relatively small share of Africa's total agricultural trade.[2] In 2019–2021, the share of intra-African agricultural exports in Africa's total agricultural exports was 19.8 percent, very similar to its value nearly two decades earlier of 20.4 percent in 2003–2005 (Figure 3.3). There was a moderate decline in the share of Africa's agricultural imports sourced from within the continent over this period, from 18.7 percent in 2003–2005 to 14.2 percent in 2019–2021, indicating faster growth in imports from the rest of the world than from intra-African sources.

Figure 3.3 Intra-African share in Africa's total agricultural trade, 2003–2005 and 2019–2021

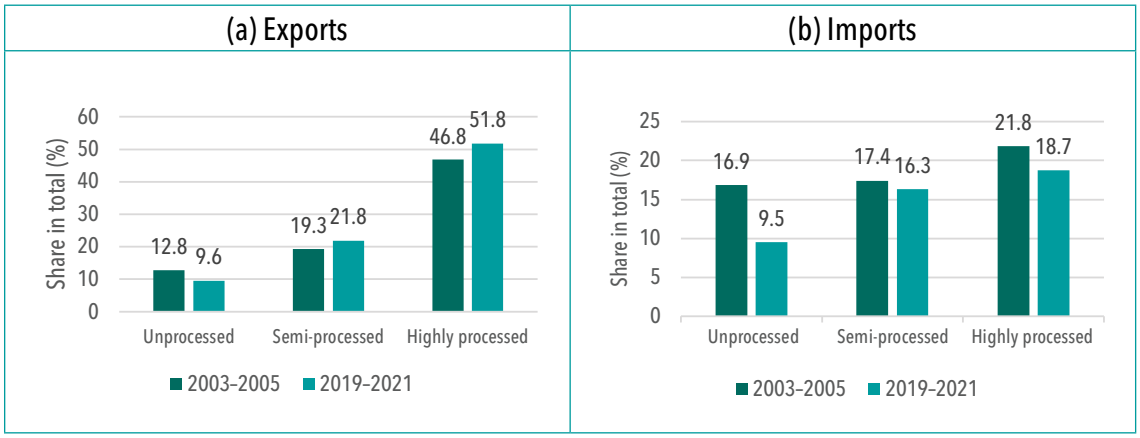


Source: Authors based on the 2023 AATM database.

There are important nuances to the intra-African shares of trade in different processing categories (Figure 3.4). In 2019–2021, over half of African countries' exports of highly processed agricultural products remained within the continent, compared with less than 10 percent of exports of unprocessed products. This reflects the important role of processed products in intra-African trade. African markets were already key destinations for Africa's highly processed agricultural exports during the 2003–2005 period, but their prominence increased over time. On the import side, the intra-African shares of unprocessed, semi-processed, and highly processed imports were fairly similar during the 2003–2005 period, ranging from 16.9 percent for unprocessed products to 21.8 percent for highly processed products. By the 2019–2021 period, intra-African shares for all three categories of imports had declined, but especially unprocessed foods. Thus, more than three-quarters of imported agricultural products in all three categories is imported from outside the continent.[3] This indicates that the continent's demand for processed food is not being met by regional exports, despite the rise in intra-African trade of processed products.

2 It is important to recall that actual intra-African agricultural trade flows are higher than the recorded trade statistics presented here, due to the large share of informal cross-border trade. Thus, the officially recorded share of intra-African trade in Africa's total agricultural trade is an underestimate.
3 As of 2021, the top non-African sources of imported highly processed agricultural products were Indonesia, Malaysia, and the United Arab Emirates. Top sources for semi-processed products were Brazil, India, and the United States, while top sources of unprocessed products were Russia, Ukraine, and India. These patterns reflect the growing importance of new trading partners outside of Europe (Odjo and Zaki 2020), as well as the exposure of African countries to negative impacts of the Russia-Ukraine war that began in 2022 due to high levels of wheat and vegetable oil imports from these countries.

Figure 3.4 Average intra-African share in total agricultural trade by processing stage



Source: Authors based on the 2023 AATM database.

Trade trends at the regional economic community and country levels

Among Africa's RECs, the Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA) dominate intra-African trade in agricultural products at all processing levels. Table 3.1 shows that in recent years (2019–2021) SADC accounted for 54 percent of all intra-African agricultural exports and COMESA for 34 percent. The shares of these regions are larger for semi-processed products (58 percent) and smaller for highly processed products (50 percent and 37 percent, respectively). Except for the Economic Community of West African States (ECOWAS) and the Arab Maghreb Union (AMU), the other regions similarly accounted for higher intra-African export shares for semi-processed products compared with highly processed products. The strong role of COMESA in intra-African agricultural trade reflects its position as the largest REC, with 35 percent of Africa's total GDP and 45 percent of total population (Table 3.1). However, SADC's share of intra-African exports is markedly greater than its share of GDP and population. SADC and ECOWAS both accounted for 27 percent of Africa's GDP in 2019–2021, but SADC's trade share is four times that of ECOWAS. ECOWAS as well as AMU and the Economic Community of Central African States (ECCAS) play a relatively small role in intra-African trade compared to their share of GDP and population.

The composition of intra-African exports has changed significantly since the 2003–2005 period. Table 3.1 shows that SADC has remained the top source of intra-African exports despite a loss of market share of 4 percentage points since 2003–2005, which disaggregates into market share losses of 8 percentage points in semi-processed products and 12 percentage points in highly processed exports, and a market share gain of 7 percentage points in unprocessed exports. The same trends in export market shares are recorded in the AMU region, with losses in processed exports and gains in unprocessed exports. In contrast, COMESA and the East African Community (EAC) have recorded significant gains in export market shares in processed and unprocessed products. ECOWAS has recorded a shift in its contribution to intra-African exports—its share of unprocessed exports has fallen by 21 percentage points while its shares of semi-processed and highly processed exports increased by 2.6 and 1.1 percentage points, respectively. This shift has resulted in an overall loss of market share in intra-African agricultural exports of 6 percentage points. ECCAS has experienced less significant changes in its participation in intra-African exports in recent years.

Table 3.1 Regional shares in Africa total: Intra-African agricultural exports, GDP, and population, 2019–2021

	Intra-African agricultural exports				GDP (%)	Population (%)
	Unprocessed products (%)	Semi-processed products (%)	Highly processed products (%)	All agriculture products (%)		
COMESA	39.4 (6.4)	57.8 (12.2)	36.8 (13.2)	42.8 (10.8)	35.2	44.8
EAC	18.1 (11.4)	20.8 (1.2)	12.5 (6.4)	16.2 (6.8)	10.6	21.1
ECCAS	1.9 (−0.1)	3.6 (0.9)	2.3 (−1.3)	2.5 (−0.3)	8.8	15.5
ECOWAS	9.3 (−20.7)	8.8 (2.6)	17.4 (1.1)	12.8 (−6.4)	27.5	29.7
SADC	57.3 (7.1)	58.6 (−7.9)	50.4 (−11.5)	54.4 (−4.1)	27.3	27.3
AMU	6.2 (4.8)	1.2 (−3.4)	7.9 (−1.1)	5.8 (0.5)	15.6	7.6

Source: Authors based on the 2023 AATM database.
Note: Numbers in brackets indicate the size of the change (in percentage points) in a region's export market share between 2003–2005 and 2019–2021. Shares in each category do not sum to 100 percent due to overlapping country membership in RECs.

Table 3.2 shows that in the 2019–2021 period, SADC and COMESA were the destinations for 49 and 45 percent of intra-African imports of agricultural products, respectively. They dominate the intracontinental markets for unprocessed and processed imports. SADC and EAC have the largest market shares for semi-processed imports, COMESA and AMU record the largest shares for unprocessed imports, while ECOWAS and ECCAS register the largest market shares for highly processed imports. In particular, ECOWAS is the destination for 21 percent of intra-African processed imports, which is almost twice the region's market share for unprocessed (10 percent) and semi-processed imports (9 percent). As was seen for intra-African exports, SADC's intra-African import share is significantly larger than its share in the continent's GDP and population, while ECOWAS plays a relatively small role as a destination for intra-African imports relative to its size.

The breakdown of intra-African imports among importing regions evolved significantly between the 2003–2005 and 2019–2021 periods. The shares of SADC and ECOWAS in intra-African import markets have fallen by 5 and 4 percentage points, respectively. More significant market share losses have occurred in processed imports in SADC and in unprocessed imports in ECOWAS. COMESA and EAC have witnessed an increase in intra-African market shares, most significantly in unprocessed imports. Import market shares changed little for ECCAS and AMU.

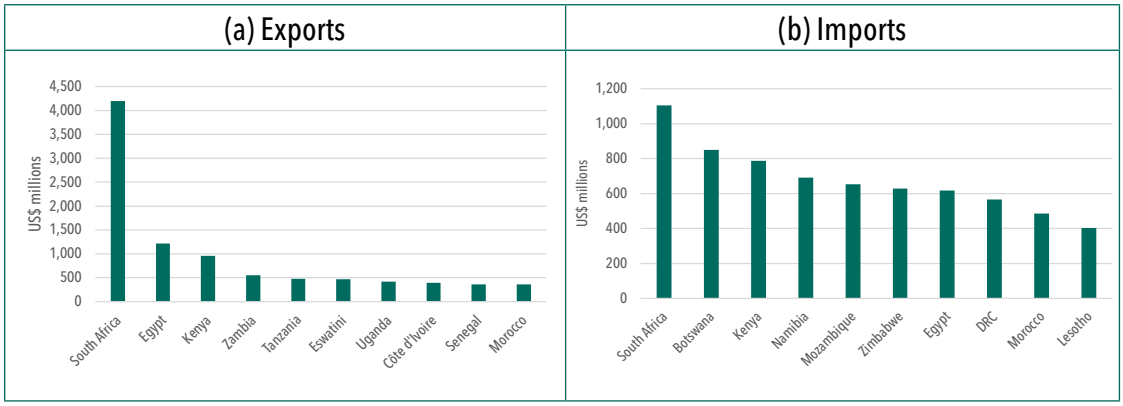
Table 3.2 Regional share in Africa total: Intra-African agricultural imports, GDP, and population, 2019-2021

	Intra-African agricultural imports				GDP (%)	Population (%)
	Unprocessed products (%)	Semi-processed products (%)	Highly processed products (%)	All agriculture products(%)		
COMESA	51.0 (11.3)	47.6 (−1.0)	39.0 (7.8)	44.8 (6.6)	35.2	44.8
EAC	17.8 (12.6)	19.9 (2.2)	17.3 (9.1)	18.1 (8.9)	10.6	21.1
ECCAS	5.4 (1.9)	9.1 (0.2)	10.3 (−5.0)	8.6 (−0.9)	8.8	15.5
ECOWAS	10.1 (−14.5)	8.9 (1.9)	21.7 (1.2)	15.1 (−3.9)	27.5	29.7
SADC	45.3 (−1.4)	52.2 (−8.7)	49.7 (−8.3)	49.0 (−5.3)	27.3	27.3
AMU	11.4 (−0.5)	10.1 (2.0)	9.4 (0.2)	10.1 (0.2)	15.6	7.6

Source: Authors based on the 2023 AATM database.
Note: Numbers in brackets indicate the size of the change (percentage points) in a region's market share between 2003–2005 and 2019–2021. Shares in each processing category do not sum to 100 percent due to overlapping country membership in RECs.

Figure 3.5 presents the top 10 countries in terms of the average value of intra-African agricultural exports and imports during the 2019–2021 period. South Africa leads both lists. The country dominates more strongly on the exports side, accounting for a full 31.9 percent of intra-African agricultural exports versus 8.4 percent of imports. Egypt, Kenya, and Morocco also figure among both the top exporters and the top importers. While many of the top exporting and importing countries are large in terms of population and GDP, several smaller players also account for significant shares of intra-African trade, including Eswatini for exports and Lesotho for imports. Both countries are neighbors of South Africa and trade extensively with that country.

Figure 3.5 Intra-African agricultural exports and imports, top countries, 2019–2021 annual average



Source: Authors based on the 2023 AA TM database.
Note: DRC = Democratic Republic of the Congo.

Table 3.3 provides further details on the role of individual countries in intra-REC agricultural trade. South Africa is the leading exporter of agricultural products within SADC as well as across the continent, accounting for 60 percent of intra-SADC exports and 32 percent of intra-African exports in 2019–2021. South Africa is the top exporter of unprocessed and processed products, with higher market shares for highly processed exports than for semi-processed and unprocessed exports. Rwanda and Tunisia are similarly leading exporters in all three product categories in their respective regions, ECCAS and AMU. Rwanda accounts for 79 percent of intra-ECCAS agricultural exports, with a larger share for unprocessed exports (88 percent). Tunisia's share of intra-AMU exports of agricultural products is smaller (48 percent), with slightly larger share for unprocessed exports (50 percent). Kenya and Tanzania lead intra-EAC agricultural exports with Kenya dominating processed exports and Tanzania dominating unprocessed exports. Leading exporters by processing stage are more diversified within the COMESA and ECOWAS regions. Ethiopia is the top intra-COMESA exporter of unprocessed products while Kenya and Egypt lead intra-REC exports of semi-processed and highly processed products, respectively. Intra-ECOWAS exports of all agricultural products are led by Côte d'Ivoire. However, despite this overall lead, Burkina Faso leads unprocessed intra-REC exports while Ghana dominates semi-processed exports, and Senegal leads highly processed exports.

For Africa as a whole, South Africa's top exports of unprocessed, semi-processed, and highly processed agricultural products include maize, crude soybean oil, and other food preparations, respectively (Table 3.3). Cereals and/or vegetable oils are also among the major traded products in several RECs, including EAC, ECCAS, ECOWAS, SADC, and AMU. Other top products of major intra-REC exporters include sugar, black tea, and vegetables from COMESA; tobacco, soups and broths, and cashew nuts from ECOWAS; and dates from AMU. Trends in intra-African trade at the product level are described in more detail in the following subsection.

Intra-REC export patterns have shown significant changes over time. Aside from SADC and AMU, where South Africa and Tunisia led intra-REC exports in all product categories in both the 2003–2005 and 2019–2021 periods, the distribution of top intra-REC exporters within other regions changed remarkably between 2003–2005 and 2019–2021. For example, Cameroon was the top intra-ECCAS exporter of all product categories in 2003–2005, and Uganda was the top intra-EAC exporter of unprocessed and semi-processed products.[4]

4 Detailed results for 2003–2005 are available from the authors upon request.

Table 3.3 Top intra-REC exporters by processing stage, 2019–2021

Region/REC		Unprocessed products	Semi-processed products	Highly processed products	All agriculture products
Africa	Exporter	South Africa	South Africa	South Africa	South Africa
	Share	30.0%	23.8%	37.1%	31.9%
	Top product	Maize (100590)	Soybean oil, crude (150710)	Other food prep. (210690)	Maize (100590)
COMESA	Exporter	Ethiopia	Kenya	Egypt	Kenya
	Share	29.9%	30.4%	28.2%	20.9%
	Top product	Other vegetables (70999)	Black tea (90240)	Sugar (170199)	Black tea (90240)
EAC	Exporter	Tanzania	Kenya	Kenya	Kenya
	Share	55.9%	31.4%	52.4%	32.2%
	Top product	Rice (100630)	Palm oil, crude (151110)	Other food prep. (210690)	Palm oil, crude (151110)
ECCAS	Exporter	Rwanda	Rwanda	Rwanda	Rwanda
	Share	88.5%	74.2%	75.6%	79.2%
	Top product	Rice (100630)	Wheat flour (110100)	Palm oil, not crude (151190)	Palm oil, not crude (151190)
ECOWAS	Exporter	Burkina Faso	Ghana	Senegal	Côte d'Ivoire
	Share	29.5%	31.4%	25.5%	24.1%
	Top product	Cashew nuts (80131)	Wheat flour (110100)	Soups and broths (210410)	Tobacco, smoking (240319)
SADC	Exporter	South Africa	South Africa	South Africa	South Africa
	Share	60.1%	45.7%	77.5%	60.1%
	Top product	Maize (100590)	Soybean oil, crude (150710)	Other food prep. (210690)	Maize (100590)
AMU	Exporter	Tunisia	Tunisia	Tunisia	Tunisia
	Share	50.1%	46.6%	46.0%	47.7%
	Top product	Dates (80410)	Olive oil (150910)	Other food prep. (210690)	Dates (80410)

Source: Authors based on the 2023 AATM database.
Note: "Share" indicates the intra-REC export share of the top exporting country in a particular REC and processing category. Numbers in parentheses are HS6 product codes.

With respect to imports, Table 3.4 shows the distribution of top intra-REC importers in the 2019–2021 period. The Democratic Republic of the Congo (DRC) is the destination for the bulk of intra-ECCAS agricultural imports at any processing stage. Unprocessed and semi-processed intra-REC imports are led by South Africa within SADC and Kenya within EAC, while highly processed imports within these regions are dominated by Botswana and South Sudan, respectively. Libya dominates intra-AMU imports of processed products while unprocessed imports are led by Morocco within the region. Within COMESA, Burundi is the top intra-REC importer of agricultural products as a whole, while more specifically, Somalia dominates unprocessed imports, Egypt leads the semi-processed imports, and Libya the highly processed imports. The same diversification of import destination by processing stage is found within ECOWAS, with Mali dominating both agricultural imports as a whole and highly processed imports, while Ghana leads unprocessed imports and Nigeria the semi-processed imports. The

top products of each importer shown in Table 3.4 reflect the trends seen in Table 3.3, with cereals and vegetable oils playing important roles in several RECs. Live cattle and raw cane sugar are the top unprocessed and semi-processed products imported by South Africa from Africa as a whole, and malt beer is Botswana's top processed import from Africa.

The leading intra-REC importers within SADC and AMU were unchanged between the 2003–2005 period and the 2019–2021 period, but patterns in most other RECs showed significant changes over time. For example, within ECCAS, Gabon, the Central African Republic, and Cameroon were the top intra-REC importers of unprocessed, semi-processed, and highly processed products, respectively, in 2003–2005, while Togo and Burkina Faso were the top intra-ECOWAS importers of unprocessed and processed products.[5]

Table 3.4 Top intra-REC importers by processing stage, 2019–2021

Region/REC		Unprocessed products	Semi-processed products	Highly processed products	All agriculture products
Africa	Importer	South Africa	South Africa	Botswana	South Africa
	Share	10.3%	14.2%	7.9%	8.4%
	Top product	Live cattle (10229)	Raw cane sugar (170113)	Malt beer (220300)	Raw cane sugar (170113)
COMESA	Importer	Somalia	Egypt	Libya	Burundi
	Share	22.0%	23.4%	17.1%	1.6%
	Top product	Other vegetables (70999)	Black tea (90240)	Processed cheese (40630)	Sugar (170199)
EAC	Importer	Kenya	Kenya	South Sudan	Kenya
	Share	45.5%	33.1%	38.9%	30.6%
	Top product	Milk and cream (40120)	Sunflower seed oilcake (230630)	Other food prep. (210690)	Milk and cream (40120)
ECCAS	Importer	DRC	DRC	DRC	DRC
	Share	90.1%	85.2%	85.8%	87.2%
	Top product	Rice (100630)	Wheat flour (110100)	Palm oil, not crude (151190)	Wheat flour (110100)
ECOWAS	Importer	Ghana	Nigeria	Mali	Mali
	Share	32.8%	24.4%	15.9%	16.5%
	Top product	Cashew nuts (80131)	Palm oil, crude (151110)	Soups and broths (210410)	Soups and broths (210410)
SADC	Importer	South Africa	South Africa	Botswana	South Africa
	Share	22.5%	28.4%	18.2%	17.5%
	Top product	Live cattle (10229)	Raw cane sugar (170113)	Malt beer (220300)	Raw cane sugar (170113)
AMU	Importer	Morocco	Libya	Libya	Libya
	Share	50.6%	32.9%	52.8%	34.1%
	Top product	Dates (80410)	Wheat flour (110100)	Maize oil, not crude (151529)	Maize oil, not crude (151529)

Source: Authors based on the 2023 AATM database.
Note: "Share" indicates the intra-REC import share of the top importing country in a particular REC and processing category. Numbers in parentheses are HS6 product codes.

5 Detailed results for 2003–2005 are available from the authors upon request.

Major traded products

Table 3.5 shows the five most traded agricultural products in intra-African markets by processing stage in the 2019–2021 period. These are primarily food items. Maize, rice, edible vegetables, coffee, and live cattle are the top five unprocessed products, accounting for 32 percent of all unprocessed products and 9 percent of all agricultural products traded within Africa. It is worth noting that cereals and livestock are also among the most traded products within Africa along informal trade corridors (Afrika and Ajumbo 2012), suggesting that the actual trade shares of maize, rice, and cattle may be substantially higher than the recorded trade shares shown in Table 3.5. The five leading semi-processed products are fermented black tea, wheat or meslin floor, raw cane sugar, crude soya-bean oil, and stemmed or stripped tobacco. These represented 40 percent of intra-Africa trade of semi-processed agricultural products and 10 percent of all agricultural trade within Africa in the 2019–2021 period. Chemically pure sucrose, non-crude palm oil, cigarettes containing tobacco, food preparations, and soups and broths and preparations are the highly processed products that are most traded within Africa. They accounted for 32 percent of intra-Africa trade of highly processed products and 15 percent of all agricultural trade within the continent in the 2019–2021 period.

Table 3.5 Top traded products among African countries by processing stage, 2019–2021

		Intra-Africa trade share (%)	
HS-6 code	Description	Share in processing category	Share in total intra-African trade
Unprocessed products			
100590	Maize (corn), other than seed	11.6	3.4
100630	Rice, semi-milled or wholly milled	6.2	1.8
070999	Vegetables, edible, fresh or chilled	5.5	1.6
090111	Coffee, not roasted or decaffeinated	4.4	1.3
010229	Cattle, live, other than pure-bred breeding animals	4.1	1.2
	Top 5, total	31.9	9.2
Semi-processed products			
090240	Tea, black, fermented and partly fermented	10.1	2.5
110100	Wheat or meslin flour	9.5	2.3
170113	Cane sugar, raw, in solid form	7.8	1.9
150710	Soya-bean oil and its fractions, crude	6.7	1.6
240120	Tobacco, partly or wholly stemmed or stripped	5.8	1.4
	Top 5, total	39.9	9.8
Highly processed products			
170199	Sucrose, chemically pure, in solid form	9.4	4.4
151190	Palm oil and its fractions, other than crude	6.6	3.1
240220	Cigarettes, containing tobacco	6.2	2.9
210690	Food preparations	5.9	2.7
210410	Soups and broths and preparations therefor	3.8	1.8
	Top 5, total	31.9	14.8

Source: Authors based on the 2023 AATM database.
Note: For intra-African trade flows, continental-level imports equal continental-level exports for every commodity in the AATM database. Hence, top traded products are the same in terms of imports as well as exports.

The top five products for each processing stage were fairly similar in the 2003–2005 period, but there have been several changes over time. For example, soups and broths replaced beer in the list of top highly processed products, and crude soya-bean oil replaced maize flour among the top semi-processed products.[6]

The analysis in this section has focused on patterns in intra-African trade in value terms. In the next section, we focus on the nutritional quality of trade. The assessment of nutritional content described below constitutes a baseline that can allow us to track changes over time. Examining changes in nutritional content should serve as an important complement to efforts under the Biennial Review to track growth in the value of trade.

Nutritional Content of Intra-African Trade

In this section, we examine African trade patterns in terms of nutritional content, specifically looking at calories, macronutrients (proteins and fats), and micronutrients (calcium, iron, zinc, vitamin A, and vitamin B12), and compare them with trade patterns in value terms (presented in the previous subsection). Trade patterns in nutritional terms and in value terms might indeed differ, due to differences in commodity prices, trade composition, and food composition. This analysis therefore highlights the contribution of trade to food security and micronutrient availability in Africa. Additionally, we identify the major trade partners and imported agricultural products from a nutritional perspective. We then discuss the nutritional content of Africa's global trade as well as intra-African trade to highlight differences in their contribution to nutrient availability.

Methodology

Our analysis of the nutritional value of trade flows draws on the methodology used by Laborde and Deason (2015), which involves applying nutrient coefficients to trade flows expressed in quantity at the HS6 product level. These nutrient coefficients were determined using published nutrition tables from the United States Department of Agriculture (USDA 2023) and from the Food and Agriculture Organization (FAO). Specifically, a mapping exercise was conducted between the HS6 classification and the products in the USDA and FAO databases to associate nutritional content to different HS6 products. This mapping process involved employing one-to-one matches, simple averages, and proxy assumptions. For the remaining unmatched products (five region-specific products), we then searched for information on their nutritional value in academic papers and official public health websites of some African countries. Further details regarding the coefficients can be found in Laborde and Deason (2015).

All agricultural products were assigned macronutrient coefficients. Micronutrient coefficients were collected only for the most significant agricultural products, due to time constraints. The list of these most significant agricultural products was selected so as to ensure that the micronutrient analysis covers at least 75 percent of global imports, 75 percent of intra-African imports, 75 percent of global exports, and 75 percent of intra-African exports in terms of quantity (weight) across all regions for the two years considered (2001 and 2021).

The analysis focuses on five micronutrients that are highly relevant to nutrition: vitamin A, vitamin B12, calcium, iron, and zinc. Although comprehensive data on micronutrient deficiencies are lacking, evidence suggests that many African countries face significant deficiencies or consumption inadequacies for these micronutrients (Mutthaya et al. 2019; Ulimwengu et al. 2023). Deficiencies in these vitamins and minerals are a major cause of illness and disability worldwide. More specifically, vitamin A deficiency is the primary cause of preventable

6 Detailed results for 2003–2005 are available from the authors upon request.

childhood blindness and a significant contributor to child sickness and deaths from other diseases (Stevens 2015). Conti et al. (2019) highlight that vitamin A deficiency represents one of the most serious public health issues in Africa, causing decreased immune system function and increased mortality during pregnancy and early childhood. Regarding vitamin B12, Green et al. (2017) underscore the crucial role it plays in cellular metabolism and red blood cell production as well as neurological functioning. Calcium deficiency is also an important health issue in Africa, affecting bone health by increasing the risk of osteoporosis and rickets, and associated with adverse pregnancy outcomes, including hypertension and preeclampsia. Conti et al. (2019) report that calcium supplementation during pregnancy has been shown to reduce the likelihood of preterm birth and neonatal mortality. Moreover, iron deficiency is the most widespread global micronutrient deficiency, leading to anemia and contributing to maternal deaths and impaired child development. Its effects on cognitive function and productivity are significant, and it is a major factor in maternal mortality and low birthweight (Conti et al. 2019). Finally, zinc deficiency impairs overall growth and development and is considered a leading contributor to the burden of disease in developing countries (Bailey, West, and Black 2015). It is also associated with increased maternal and infant mortality rates (Conti et al. 2019). This list of critical micronutrients for Africa is not exhaustive, and could be expanded in further research.

The analysis here focuses on the overall intake of nutrients without distinguishing between their use for food and feed purposes. There is indeed no clear-cut distinction in the use of agricultural products for food versus feed purposes across Africa as a whole. Moreover, our analysis aims to examine the nutritional trade balance, which should encompass all sources of nutrient supply, including the "indirect" ones. For instance, this analysis captures both the iron imported in the agricultural products directly consumed by humans and the iron imported in the feed that is consumed by livestock and then by humans who consume the resulting meat.

The analysis on the nutritional content of trade flows is based on US food composition tables (USDA 2023). This is a limitation of our analysis as there are regional differences in food composition due to a range of factors, such as different varieties of crops[1], soil quality (for instance there is a soil zinc deficiency in Africa, as highlighted in Singh et al. 2023), growing conditions (Maseko et al. 2019), and food processing techniques (Pretorius et al. 2023). To assess the extent to which this shortcoming affects our conclusions, a sensitivity analysis (described in Appendix 3.1) is performed in which the results obtained using the US food composition tables are compared to those we get using food composition tables specific to West Africa (Vincent et al. 2020). The sensitivity analysis indicates that, except for zinc, the findings remain consistent across all nutrients (although there are more variations for iron, vitamin A, and vitamin B12). For zinc, there is a systematic overestimation of nutrient content using the US food composition tables compared to the values derived from West African food composition tables. This overestimation might be related to soil deficiencies in zinc in Africa.

Furthermore, the analysis focuses solely on the availability of nutrients, and thus does not provide insights into their bioavailability. Determining the bioavailability requires a more comprehensive analysis, as the body's capacity to absorb nutrients varies depending on health status, overall diet composition, and other factors. For instance, certain seeds and cereal grains contain phytic acid, a component that hinders the bio-absorption of some minerals, especially zinc, calcium, and iron (Zhou and Erdman 1995).

Comparison of national nutrient requirements and nutritional content of African imports

To analyze the nutrient content of African imports, the values obtained were compared with the national nutrient requirements. The latter were determined using the Recommended Dietary Allowances (RDAs) from the National Academies of Sciences, Engineering, and Medicine (2019).[7] These recommendations were combined with detailed population data, including age groups and specific groups (including pregnant and breastfeeding individuals), sourced from the United Nations (UN DESA 2022). The caloric requirement was determined differently due to the absence of a reference value in the data from the National Academies and due to the inherent complexity in establishing caloric requirements, notably incorporating basal metabolic rate considerations. The reference value was therefore retrieved directly at the country-level from FAOSTAT, using the average dietary energy requirement (ADER) indicator (FAO 2023c).

It is worth highlighting that comparing nutrient trade flows with international and US nutritional guidelines is an initial step toward estimating nutritional requirements. For a more accurate assessment of nutritional needs, it would be crucial to consider local dietary patterns and region-specific public health concerns.

Trade plays a significant role in supplying macronutrients to Africa: it contributes more than half of the caloric requirements (56 percent) and over 90 percent of the protein requirements overall (Figure 3.6). However, there is a notable heterogeneity among RECs. Specifically, trade supplies only 21 percent of the caloric requirement and 26 percent of the protein requirement in the EAC. However, the AMU countries import more than what is necessary to meet their caloric and protein needs, with imported calories being 1.69 times the requirement and proteins 3.17 times the requirement.

Figure 3.6 Imported nutrients compared to nutritional requirements, 2021

Source: Authors based on the 2023 AATM database.
Note: The reference value represents the nutritional requirements for each nutrient (kcal, macronutrients, and micronutrients). The reference value is the cost of a healthy diet determined by FAO (2023a).

7 RDAs represent the estimated level of nutrient intake sufficient to meet the needs of almost all healthy individuals.

High supplies of calories and protein in AMU countries reflect the findings of Gebremedhin and Bekele (2021), which show that North African countries have the highest per capita calorie and protein supplies on the continent, exceeding the African average by 17 and 26 percent, respectively.

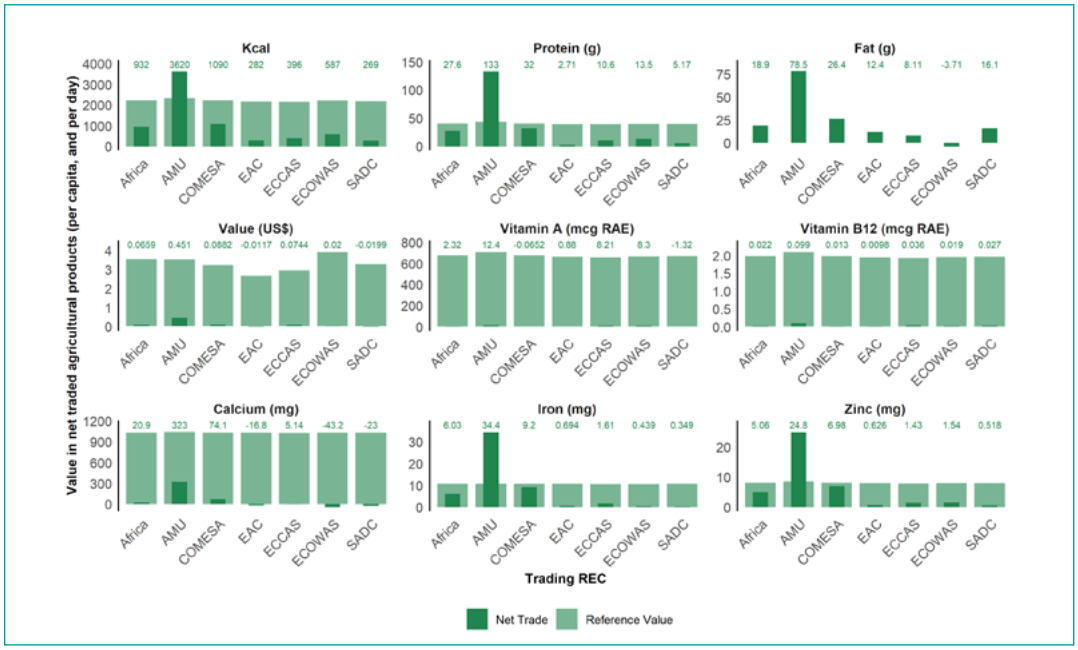
The per capita value of the total imports of agricultural products is relatively low compared to the cost of a healthy diet as determined by FAO (2023a). Specifically, it accounts for less than 6 percent of the overall cost of a healthy diet in Africa, suggesting that the high cost of a healthy diet may not result primarily from prohibitive food import bills, but also stems from other structural issues (including internal policies and domestic production, among others). Again there are some notable regional differences. For instance, in EAC, the per capita value of those imports is less than 3 percent of the cost of a healthy diet, whereas in AMU it represents more than 18 percent of the cost of a healthy diet.

For micronutrients, the situation is quite different. For Africa as a whole, trade serves as a valuable source of zinc (meeting 87 percent of the requirement) and iron (fulfilling 89 percent of the requirement), but it contributes very little to vitamin A (less than 3 percent), vitamin B12 (2.19 percent), and calcium (10.4 percent). This would not be of concern if countries could reach adequate levels of these nutrients through their own food production, but the literature suggests that this may not be the case for all nutrients. For example, Geyik et al. (2020) compare regional production of nutrients with requirements and find that aggregate vitamin A and B12 production in Africa south of the Sahara fell consistently short of population requirements over the past two decades. Chen et al. (2021) similarly find inadequate production of calcium and vitamins A and B12 (among other nutrients) in the region. At the country level, production of calcium is inadequate in nearly all African countries, production of vitamin A is inadequate in about three-fourths of African countries, and production of vitamin B12 is inadequate in about half of them.

Significant heterogeneity can be observed among the RECs, with AMU countries tending to import more nutrients and the EAC countries importing less. Moreover, there is intra-REC heterogeneity as well. For example, within ECOWAS, the overall calorie imports are 863 kcal/capita/day, but Mali only imports 290 kcal/capita/day, while Senegal imports 2,100 kcal/capita/day. Differing levels of imports may reflect multiple factors, including domestic resources and production patterns, domestic incomes, trade costs, and trade policies, among others (Vacu and Odhiambo 2020; Wang and Sarkar 2022).

In terms of net trade, Africa imports more calories than it exports, with net traded calories meeting 42 percent of caloric requirements (Figure 3.7). Similarly, Africa tends to import more protein than it exports. Net traded proteins fulfill 68 percent of the protein requirement. Africa as a whole has an agricultural trade deficit, but the per capita and per day values remain relatively low in comparison to the daily cost of a healthy diet, accounting for less than 2 percent. However, it is important to note the differences among RECs: EAC and SADC have a positive trade balance in the agriculture sector, while for AMU, the per capita and per day agricultural trade deficit represents as much as 13 percent of the cost of a healthy diet.

Figure 3.7 Nutritional content of net trade compared to nutritional requirements, 2021



Source: Authors based on the 2023 AATM database.

Note: The reference value represents the nutritional requirements for each nutrient (kcal, macronutrients and micronutrients). For US$ value, the reference value is the cost of a healthy diet determined by FAO (2023a).

As for micronutrients, net traded imports cover 56 percent of the continent's iron requirements and 62.6 percent of the zinc requirements. However, for certain nutrients that are scarce in imports, such as calcium and vitamin A, the exports create a negative balance for some RECs, as observed in the case of ECOWAS and calcium.

The role of intra-African trade

The majority of imported calories and nutrients in Africa are sourced through global trade, with intra-African trade accounting for a relatively small proportion (Figure 3.8). Intra-African trade contributes 9.8 percent of the total imported calories, 8.6 percent of the total imported proteins, 8.3 percent of the total imported iron, and 5.9 percent of the total imported zinc. However, intra-African trade is more significant for vitamins A and B12, representing 34.2 percent of vitamin A imports and 30.1 percent of vitamin B12 imports. Although data are limited, research suggests that these vitamins are among the micronutrients for which significant inadequacies exist in Africa (Muthayya et al. 2013; Ulimwengu et al. 2023). Although overall imports of these nutrients are limited compared to requirements (Figure 3.6), imports from Africa play a prominent role, reflecting findings by Geyik et al. (2021) on the important contribution of intra-African trade to meeting micronutrient requirements. Further increases in intra-African trade could potentially improve health and nutrition by addressing these gaps. It is also worth recalling that the contribution of intra-African trade as a source of nutrients is underestimated, since this analysis does not account for informal trade. For instance, the informal cattle trade, if considered, would increase the already notable contribution of intra-African trade to vitamin B12 imports.

Figure 3.8 Origin of imported sources of nutrients, 2021

Source: Authors based on the 2023 AATM database.

The significance of intra-African trade in nutrients varies among RECs, with SADC's intra-African nutrient imports particularly high. Although intra-African trade accounts for only 35.2 percent of the total value of SADC's imports and 33 percent of its calorie imports, it plays a substantial role for some of its nutrient imports. Notably, 56.7 percent of SADC's vitamin A imports, 48.4 percent of its vitamin B12 imports, and 67.9 percent of its calcium imports originate within Africa. Intra-African trade also plays a large role in EAC's imports of several micronutrients, including vitamins A and B12. For most RECs, intra-REC trade accounts for a far higher share of most nutrient imports than trade with other (extra-REC) African countries, with the exceptions of ECCAS and AMU.

Main agricultural products in Africa's agricultural trade in nutrient terms

In Africa, the majority of imported calories can be attributed to wheat, durum wheat, and maize (Table 3.6). However, there is variability among RECs, as rice, oils, and sugar are among the top three imports for some RECs.[8] It is important to note that, when considering only intra-African trade, the majority of imported calories come from maize and sugars (molasses and sucrose).

8 Detailed results at the REC level are available upon request from the authors.

Table 3.6 Top nutrient sources in imported agricultural products (ranked in decreasing order), 2021

Nutrient	Rank	Intra-African trade	Share (%)	Total trade	Share (%)
Kcal	1	100590 - Maize	10.5	100199 - Wheat and meslin, other than durum	24.1
	2	170310 - Molasses from sugar cane	10.4	100590 - Maize	10.3
	3	170199 - Sucrose, chemically pure	8.0	100119 - Durum wheat	9.5
Protein (g)	1	100590 - Maize	10.7	100199 - Wheat and meslin, other than durum	29.1
	2	230400 - Oil-cakes, soybean	9.0	100119 - Durum wheat	12.8
	3	230630 - Oil-cakes, sunflower	6.6	120190 - Soybeans	11.5
Fat (g)	1	151190 - Palm oil, not crude	25.2	151190 - Palm oil, not crude	31.9
	2	150710 - Soybean oil, crude	12.6	150710 - Soybean oil, crude	10.7
	3	150790 - Soybean oil, not crude	5.8	151110 - Palm oil, crude	9.1
Value (US$)	1	170199 - Sucrose, chemically pure	4.7	100199 - Wheat and meslin, other than durum	12.8
	2	151190 - Palm oil, not crude	3.5	100119 - Durum wheat	6.2
	3	100590 - Maize	3.1	100630 - Rice, milled	6.0
Vitamin A (mcg rae)	1	070610 - Carrots and turnips	34.5	100590 - Maize	27.6
	2	151710 - Margarine, not liquid	24.9	151710 - Margarine, not liquid	19.8
	3	100590 - Maize	8.1	070610 - Carrots and turnips	15.0
Vitamin B12 (mcg rae)	1	010229 - Cattle, other than pure-bred for breeding	26.1	010229 - Cattle, other than pure-bred for breeding	23.5
	2	010613 - Camels	25.7	020714 - Chicken cuts and offal, frozen	21.0
	3	040120 - Low-fat milk	9.9	010290 - Bovine animals, other than cattle and buffalo	9.8
Calcium (mg)	1	170310 - Molasses from sugar cane	46.0	100199 - Wheat and meslin, other than durum	28.3
	2	120740 - Sesamum seeds	5.8	120190 - Soybeans	21.5
	3	120729 - Cotton seeds	3.8	100119 - Durum wheat	11.0
Iron (mg)	1	170310 - Molasses from sugar cane	25.8	100199 - Wheat and meslin, other than durum	50.1
	2	230230 - Bran, wheat	13.0	100119 - Durum wheat	12.7
	3	100590 - Maize	12.2	100590 - Maize	10.2
Zinc (mg)	1	100590 - Maize	19.0	100199 - Wheat and meslin, other than durum	43.8
	2	230230 - Bran, wheat	17.1	100119 - Durum wheat	20.4
	3	120729 - Cotton seeds	4.4	100590 - Maize	11.3

Source: Authors based on the 2023 AATM database.
Note: "Share" indicates the percentage of imported nutrient from the agricultural product, relative to the total imports of each nutrient. As mentioned in the methodology subsection, the analysis focuses on the overall intake of nutrients without distinguishing between their use for food and feed. Livestock feeds are therefore considered.

Wheat, durum wheat, maize, and rice (in some RECs) are the primary sources of imported zinc and imported iron, considering total imports. Furthermore, wheat, durum wheat, and soy are the main sources of imported calcium and proteins, although there are differences across RECs. The situation is different in intra-African trade, where molasses is the primary source of calcium and iron, and maize and oil-cakes are the main sources of proteins.

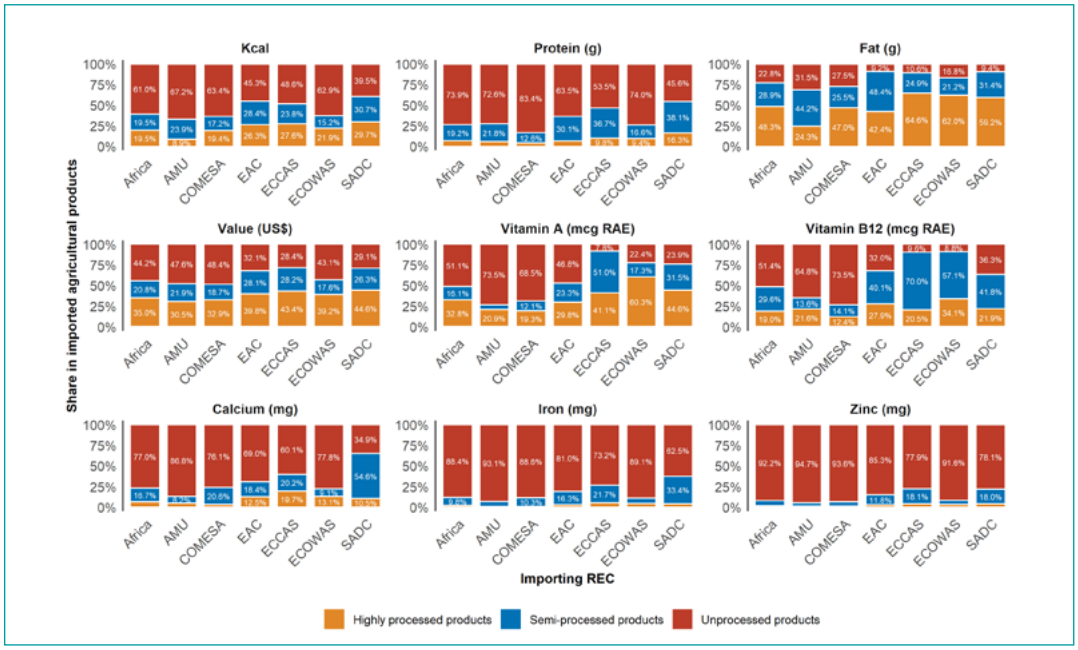
The primary sources of imported fat are palm oil and soybean oil, both in terms of total trade and intra-African trade. Animal products constitute the main source of imported vitamin B12, while maize, margarine, and carrots contribute significantly to imported vitamin A, both in total trade and intra-African trade.

As highlighted in the previous section, intra-African trade is a major source of imported vitamins A and B12. Considering that maize, margarine, carrots, and meat are among the primary sources of these micronutrients in intra-African imports, countries and RECs should ideally avoid including these products in their exclusion lists under the AfCFTA and should establish or harmonize sanitary standards so as to foster the intra-African trade of these products and enhance their contribution to the micronutrient supply.

Processing stage of imported sources of nutrients

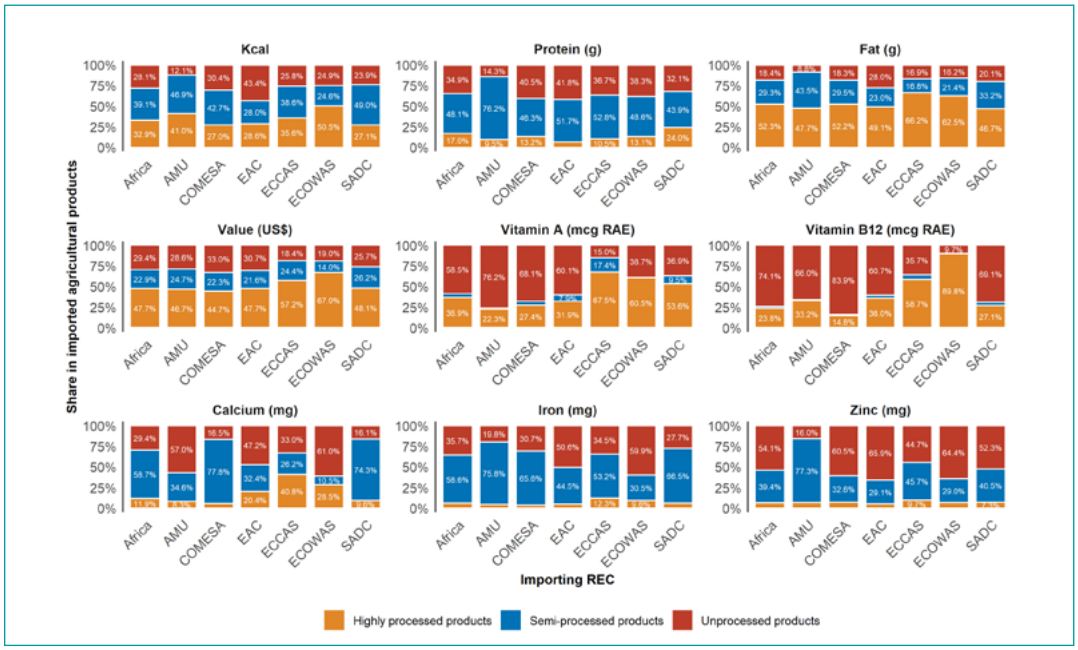
There are important differences in the sources of imported nutrients in Africa in terms of processing stage. Unprocessed agricultural products, such as wheat, durum wheat, maize, soybeans, and rice, are the main sources of imported calcium, iron, protein, and zinc. However, for vitamins A and B12 and for total calories, semi-processed and highly processed agricultural products play a significant role, including some animal products, dairy products, margarine, oils, and sugar. In terms of the value of imports, highly processed and semi-processed agricultural products also hold considerable importance. When comparing global imports with intra-African imports, it is apparent that highly processed and semi-processed products play a more prominent role in intra-African imports than in Africa's global imports, in value terms and for most nutrients (Figure 3.9). For example, semi-processed and highly processed agricultural products are more important sources of imported calcium, iron, protein, and zinc with regards to intra-African trade imports (Figure 3.10). For both intra-African imports and total imports, highly processed products account for larger shares of imported fats than of calories or of value (except for AMU); this reflects the importance of palm oil among traded processed products (Table 3.5).

Figure 3.9 Processing stage of imported nutrients, total trade, 2021



Source: Authors based on the 2023 AATM database.

Figure 3.10 Processing stage of imported nutrients, intra-African trade, 2021



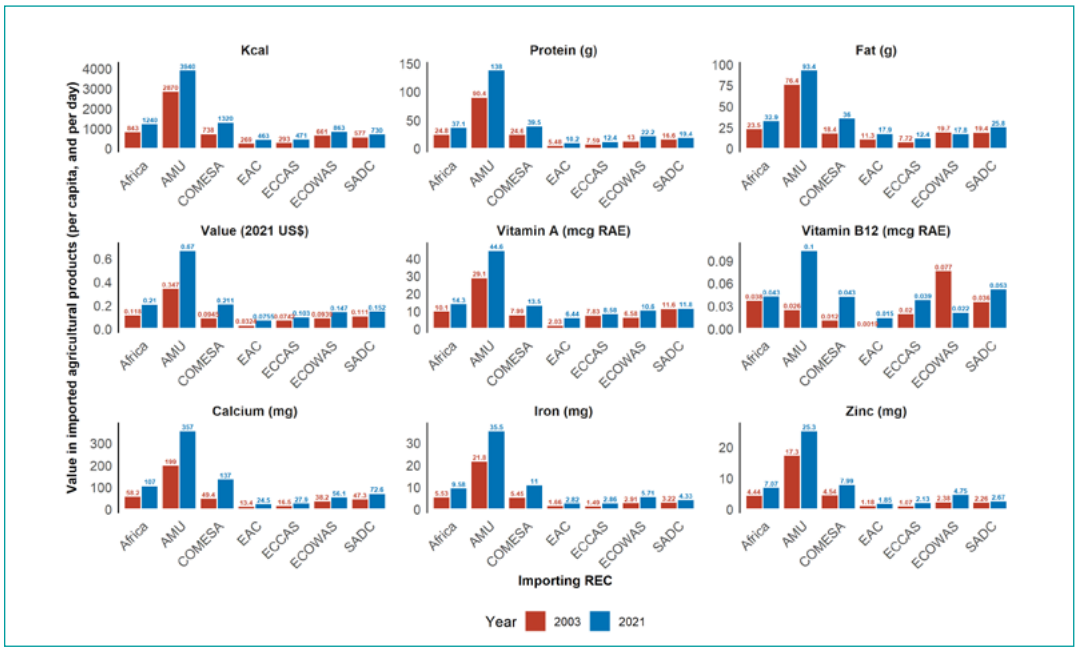
Source: Authors based on the 2023 AATM database.

Trends in nutritional content of Africa's agricultural trade over time

The previous subsections have underscored that there are differences between trade patterns in value terms and nutritional terms. Specifically, intra-African trade plays a variable role, the main agricultural products differ, and the significance of processed products varies between the two measures (value and nutrition). This subsection focuses on the evolution of these trade patterns over time to determine whether trade patterns in value terms and nutritional terms exhibit similar trends.

At the African level, there has been an overall increase in the real value of imports from 2003 to 2021 after accounting for inflation,[9] accompanied by a rise in the total calories and total nutrients imported. However, the growth rates differ notably. Specifically, there has been a higher percentage increase in the value of imports (77.4 percent) compared to the increase in calories (47.1 percent), proteins (49.7 percent), and fat (40.1 percent). The generally slower growth in macronutrient content compared to the growth in value is likely related to the overall increase in food prices, as reflected by the FAO Food Price Index, which increased in real terms by more than 70 percent between 2003 and 2021 (FAO 2023b). Regarding micronutrients, the growth varies, ranging from an increase of 14.2 percent for vitamin B12 to 84.5 percent for calcium (as depicted in Figure 3.11). The variations in growth rates among nutrients are a result of compositional changes in the most imported agricultural products, leading to fluctuations in nutrient content. Relatively large increases in imports of proteins, vitamin B12, and calcium compared with calories may reflect growing consumption of animal products.

Figure 3.11 Nutrient content of Africa's total agricultural imports, 2003 and 2021



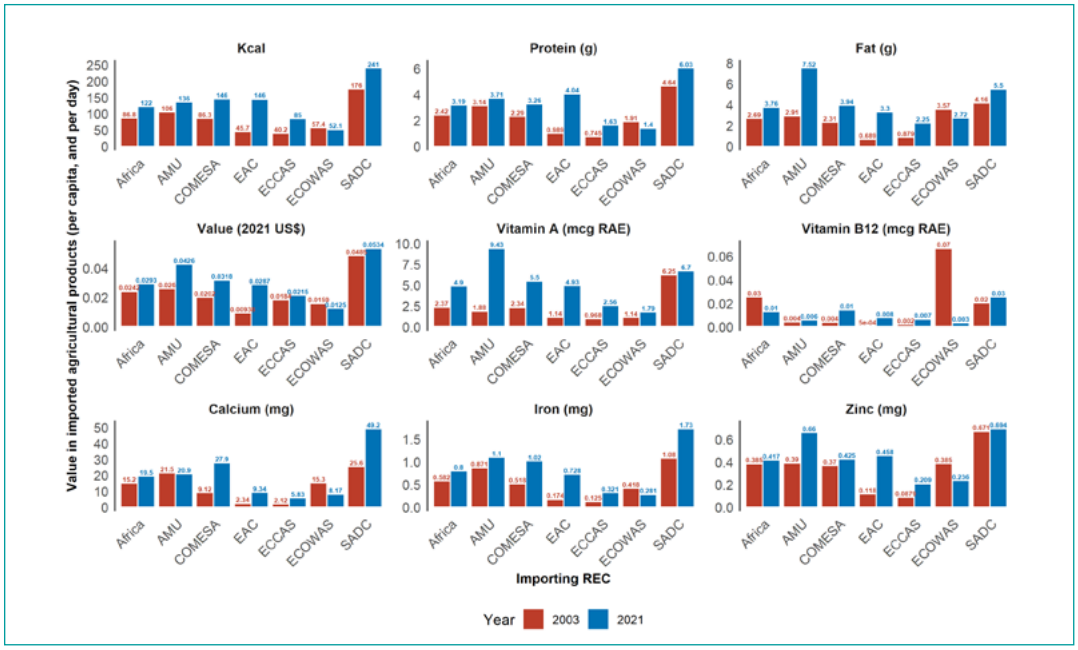
Source: Authors based on the 2023 AATM database.

Distinct trends can be observed among the RECs. For instance, in AMU, there is a notable increase in the value, protein content, and overall nutritional content of agricultural imports (excluding fat), surpassing the growth in caloric content. While increases in value likely reflect in part the general increases in food prices, as mentioned above, the increase in protein and micronutrient content relative to caloric content may be attributed to an upmarket shift in the imported products, indicating a preference for more nutrient-rich goods. Conversely, in ECCAS, the growth in the value of imports is comparatively slower than the increase in caloric content. This suggests an increase in imports of high-calorie goods, potentially indicating a greater focus on quantity rather than nutritional quality in the imported products within the ECCAS region. Across all other RECs, similar to the AMU case, growth in value outpaces the growth in caloric content. However, in contrast to the AMU case, the relative growth rates of other nutrients are not consistently higher than the growth rate of calories.

9 The AATM data on trade values, initially in current US dollars, were converted to 2021 constant US dollars with the GDP deflator from the World Bank.

When considering only intra-African trade, a similar pattern emerges: there is an increase in the value of imports from 2003 to 2021, reflecting an increase in imports of calories and most nutrients (Figure 3.12). However, the growth in the value of intra-African imports (20.9 percent) is significantly less than the increase in total imports (77.4 percent). The growth rate of the volume of calories is similar for both intra-African trade (40.7 percent) and total trade (47.1 percent). The fact that total trade shows higher growth in value terms than in calorie terms, while the reverse is true for intra-African trade, suggests that higher-value food products still tend to be imported predominantly from outside the continent, despite growth in intra-African trade of processed products.

Figure 3.12 Nutrient content of intra-African agricultural imports, 2003 and 2021



Source: Authors based on the 2023 AATM database.

In terms of specific nutrients, the growth in intra-African imports of calcium (28.4 percent) is less significant than in total imports of calcium (84.5 percent increase). The same applies to iron (37.5 percent versus 73.3 percent), protein (31.5 percent versus 49.7 percent), and zinc (8.5 percent versus 59 percent). However, when it comes to vitamin B12, there is a decrease in intra-African imports (−48.9 percent) despite an increase in total trade (14.2 percent), primarily due to a significant decrease in imports by the ECOWAS region. However, the increase in intra-African imports of vitamin A (106.9 percent) is more substantial than in total imports (42.3 percent). Finally, the growth in fat imports shows similar values for both intra-African trade and total trade, with an increase of about 40 percent in both cases.

Distinct trends are observed among the RECs, including territorial disparities within each REC. Notably, imported foods tend to constitute a higher share of diets in urban areas compared within rural areas (Tschirley et al. 2015), and urban diets tend to be more diversified than those in rural areas (Casari et al. 2022). Consequently, the increase in the availability of micronutrients within a REC is expected to be more marked in these urban areas.

Addressing Food Safety and Sanitary and Phytosanitary Issues

The analysis of the nutritional content of Africa's agricultural trade in the previous section has highlighted the important but uneven contribution of both global and intra-African trade to meeting Africa's nutrient needs. In this section, we examine two closely interrelated policy issues that can threaten or enhance the ability of intra-African trade to contribute to nutritious diets: the safety of food supplies and the quality of sanitary and phytosanitary (SPS) systems. Problems in these areas can prevent nutrient-rich food from reaching consumers or negate their potential positive health impacts. This section also reviews the potential role of the AfCFTA in improving access to nutritious food through trade.

Food safety is a major issue affecting health, food security, and nutrition as well as productivity and overall economic development in Africa. Weak regulatory systems, low capacities, and limited consumer awareness and demand for safe food contribute to an extremely high burden of foodborne diseases in Africa, estimated at 135 million illnesses and 180,000 deaths per year as of 2018 (Jaffee et al. 2020). Food safety and nutrition issues are closely linked. While poor nutrition can weaken immune responses and make individuals more vulnerable to foodborne disease, bouts of foodborne disease can also negatively impact current and future nutrition status by preventing nutrients from being absorbed and metabolized through a variety of mechanisms (Nordhagen et al. 2022). Nutrient-rich foods such as vegetables and animal products are key sources for many food-borne hazards (Hoffman et al. 2017; Sapp et al. 2022).

Food safety is frequently discussed in the context of trade, and many efforts to improve food safety systems in Africa have the objective of ensuring the safety of Africa's extracontinental exports and maintaining the access of Africa's producers to global markets. For example, a World Bank study (2022) showed that over half of donor investments in food safety as well as national projects on food safety control systems and laboratory capacities are focused on overseas export markets. Improving the safety of food traded within Africa is also an important outcome of efforts to improve domestic food safety systems. Food safety issues can cause costly disruptions to intra-African trade. Examples include a 2017–2018 listeriosis outbreak in South Africa that provoked product recalls and import bans of processed meat in a number of other countries (WHO 2018), as well as a 2020 Kenyan ban of imports of maize from Uganda and Tanzania due to aflatoxin contamination, which caused maize prices faced by Kenyan millers to double (Ndemera, Gokah, and Gichuri 2023).

However, food safety is a domestic issue as well. The costs to African countries associated with unsafe food consumed domestically, though difficult to estimate due to lack of data, are likely much higher than trade-related costs (Jaffee et al. 2020). The strong focus on trade within efforts to improve food safety systems has had positive impacts in terms of increasing the ability of African countries to export to high-value global markets (World Bank 2022; Jaffee et al. 2020), and in some cases, participation in global trade can spur greater investments in food safety that contribute to safer domestic food supplies (FAO 2018). However, potentially disproportionate attention to trade also risks stalling efforts to improve food safety in domestic markets, to the extent that regulatory resources are reallocated to exports. In some cases, unsafe food rejected from export markets may be redirected to domestic markets, negatively affecting the health of African consumers (Mbithi 2019).

African governments and development partners should work to strengthen domestic food safety systems to improve the quality of both domestically consumed and exported products. Industry associations can play a role in helping to coordinate inspections and other food safety compliance activities to lower costs, and governments can work with associations to support

producers in complying (Mbithi 2019). Improving consumer education and strengthening domestic demand for food safety could also be an important avenue to increase incentives for other food system actors to supply safe foods. In Kenya, for example, consumer demand has been credited with driving informal milk traders to improve hygiene (World Bank 2022).

Food safety systems are part of broader SPS systems that seek to protect animal and plant health as well as ensuring safe food. Countries, regions, and continental institutions should also continue efforts to facilitate trade in safe food by harmonizing SPS requirements and strengthening SPS systems. The African Union's SPS Policy Framework, adopted in 2019, aims to support the implementation of Annex 7 of the AfCFTA, which concerns SPS measures. The Policy Framework calls for action by continental institutions, RECs, member states, and private sector actors to pursue four objectives: (1) establishing harmonized science-based SPS systems, (2) strengthening collaboration and trade facilitation, (3) building technical SPS capacities in countries and RECs, and (4) increasing public and private sector investment in SPS systems (AUC 2019). Implementation of the SPS Policy Framework can help to improve food safety, improve competitiveness in both regional and global markets, and contribute to the implementation of the AfCFTA (Box 3.2). In addition to strengthening capacities of governments and RECs to design and implement SPS regulations, support should also be provided to help traders comply with SPS requirements.

Most of Africa's RECs have regional SPS policy frameworks and/or coordination mechanisms in place; however, progress toward harmonization of SPS measures across member states has been delayed by capacity and resource issues (Chinyamakobvu 2017). COMESA and SADC have relatively advanced coordination systems, with operational regional working groups with participation from food safety authorities in member states (Molnar and Godefroy 2020). COMESA provides a range of SPS-related capacity strengthening activities and other support for member states, including training on SPS issues, support for review of national SPS legislation, facilitation of cooperation among member states on risk profiles and risk management for commonly traded commodities, and identification of opportunities to reduce costs associated with SPS measures (Malabo Montpellier Panel 2020; COMESA 2019).

Box 3.2 African Continental Free Trade Area: Potential contribution to nutrition

The AfCFTA and nutrition, food security, and food safety

Enhancing nutrition is not an explicit goal of the AfCFTA. However, expanded intra-African trade could improve nutrition by increasing the supply of nutritious foods through increased trade between surplus and deficit areas, as well as by improving access to foods through increased incomes. At the time of this writing, detailed assessments of the potential impact of AfCFTA implementation on nutrition in Africa had not been carried out. However, ex ante analyses of the economic impacts of AfCFTA implementation suggest that the agreement has significant potential to increase food security. For example, Simola et al. (2022) conclude that the AfCFTA will raise incomes and agricultural production in most areas and will boost food consumption throughout the continent.

The AfCFTA could also contribute to changes in diet composition, both by accelerating changes in food consumption patterns related to increased income and by altering the supply or prices of particular food products through changes in trade flows. UNECA (2018) suggests that the agricultural products for which AfCFTA implementation will increase trade the most include sugar, fruits and vegetables, nuts, beverages and tobacco, and meat and dairy products. The World Bank (2020) predicts a 49 percent increase in the trade of agricultural products by 2035 relative to baseline trends, with a higher (91 percent) increase in trade of processed foods. Simola et al. (2022) examine changes in food consumption patterns due to the AfCFTA, and project the largest consumption increases in vegetable oils, beverages and tobacco, animal products, processed rice, other processed foods, and sugar. These findings suggest potential mixed impacts of the AfCFTA on nutrition. While increased trade in fruits and vegetables has the potential to increase supplies of important micronutrients, beverages and tobacco as well as sugar are unlikely to make a positive contribution to nutrient needs. Increased consumption of vegetable oils and animal products can contribute needed micronutrients including vitamins A and B12, but may also be relatively high in fat.

Implementation of the AfCFTA could also improve food safety through strengthening of SPS systems. The first objective of Annex 7 of the AfCFTA Agreement, which focuses on SPS measures, is to facilitate trade while safeguarding human, animal, and plant life and health. The text of the annex calls for countries to use internationally accepted risk assessment techniques to assess health and safety risks, and to develop SPS measures based on international standards with attention to regional harmonization.

Role of informal trade

As noted earlier, informal cross-border trade accounts for a substantial share of intra-African trade, particularly agricultural trade. Informal trade plays an important role in ensuring regional food supplies as well as contributing to livelihoods. However, high levels of informal trade also make food safety and other regulations more difficult to enforce (Global Panel 2020). Several studies suggest that perishable products, for which lengthy border crossing times are especially costly, are more likely to be traded informally than nonperishable products (Bensassi, Jarreau, and Mitaritonna 2016; Siu 2019). Perishable products are important for nutrition, as they tend to be more nutrient-dense than nonperishable staples but they are vulnerable to food safety issues and account for a large share of foodborne disease. Formalizing informal trade is an important goal of many ongoing trade facilitation efforts in Africa. To the extent that AfCFTA implementation and related trade facilitation efforts are successful in improving efficiency and reducing barriers to formal trade, they could also contribute to formalizing some portion of Africa's informal cross-border trade (Dushime 2021; Mold and Chowdhury 2021). This would serve to bring more trade under SPS systems and help to improve the safety and nutrient retention of traded food.

Conclusion

In this chapter, we reviewed patterns in intra-African agricultural trade in terms of value and nutritional content. In value terms, intra-African agricultural trade has increased significantly since the early 2000s, but as of 2021 remains below the peak of $16.1 billion recorded in 2013. The trade share of processed products is significant and growing, reaching 46.3 percent of intra-African agricultural trade in the 2019–2021 period. Around 14 percent of Africa's total agricultural imports are sourced from within the continent, and 20 percent of total agricultural exports are destined to the continental market, suggesting that non-African countries (global markets) still play the predominant role as trade partners to African countries—with an important caveat that the share of intra-African trade in Africa's total trade is underestimated by official statistics that do not capture informal cross-border trade. However, a growing share of Africa's imports and exports of processed products are sourced from or destined to the continent, showing the relative importance of African markets for Africa's domestic processing sector.

Among RECs, SADC and COMESA dominate intra-African agricultural trade at all product processing levels. SADC alone accounts for over half of intra-African agricultural exports and nearly half of imports, although its share has fallen slightly over time. South Africa is the top contributor to agricultural exports and imports, both within SADC and the continent as a whole, accounting for over 30 percent of intra-African agricultural exports and 8 percent of imports. Reflecting patterns at the REC level, other southern and eastern African countries also play important roles in intra-African trade, including Egypt, Kenya, Zambia, and Tanzania on the export side and Botswana, Kenya, Namibia, and Mozambique on the import side.

The top agricultural product traded within the continent is pure sucrose, a highly processed product accounting for 4 percent of intra-African agricultural trade. Other top processed products include palm oil, cigarettes, other food preparations, and soups and broths; these products together account for 15 percent of intra-African agricultural trade. The top traded semi-processed products include tea, wheat or meslin flour, cane sugar, crude soybean oil, and partly or wholly stemmed tobacco, while top unprocessed products include maize, rice, edible vegetables, coffee, and live cattle.

We also converted trade flows into their nutritional content—calories, proteins, fats, and key micronutrients—in order to examine trends in the nutritional content of trade. Africa's global trade contributes significantly to total requirements for calories, proteins, and several micronutrients, including iron and zinc. Intra-African trade plays a relatively smaller role in contributing to Africa's nutrient needs, as reflected by the moderate share of intra-African trade in Africa's total agricultural trade in value terms. However, intra-African trade is an important source of vitamins A and B12, particularly for SADC and EAC countries. Processed products represent a larger share in imports of most nutrients at the intra-African level than for Africa's total trade, as reflected by the relative importance of processed products in intra-African trade in value terms. However, several limitations of this analysis should be noted. The assessment of the nutritional content of trade and its relationship with nutrient requirements is based on US food composition tables and primarily US-based nutrient intake guidelines. For more accurate assessments, country-specific information on food composition and nutrient requirements should be used; future analyses can improve in this area as this information becomes available for a larger number of African countries. The analysis also does not take into account potential variations in bio-availability of nutrients that depend on multiple factors.

The chapter also reviewed literature on the impacts of trade on nutrition and discussed policies that can help maximize positive impacts. In general, trade helps to increase the overall supply of food, which improves food security, as well as increasing dietary diversity, with positive impacts on undernutrition and hidden hunger. However, to the extent that it increases access to foods associated with diet-related NCDs, trade also has the potential to exacerbate growing issues of overnutrition.

Policies to improve diets should focus not on restricting trade but rather on the entire domestic supply of food, with quality or nutritional standards applying to locally produced as well as imported food. Food safety, which has important implications for nutrition, should similarly not be considered as purely or primarily a trade issue. Rather, efforts should be made to increase the safety of exported as well as domestically produced foods and to increase demand for safe food. Other domestic strategies to improve diet quality can include efforts to educate consumers and build demand for healthy diets. For example, nutrition education interventions such as home visits, cooking demonstrations, and provision of education to community leaders and children's caregivers have shown positive impacts on child nutrition status in developing countries (Majamanda et al. 2014). Education programs should be combined with other strategies to address micronutrient gaps, such as supplementation programs to increase nutrient intake, industrial fortification to improve the nutrient content of processed foods, and biofortification to improve the nutrient content of crop production (Ulimwengu et al. 2023).

Despite some trade-offs, increased intra-African trade has significant potential not only to increase economic growth and contribute to remunerative livelihoods, but also to improve diets both in terms of quantity and quality and contribute to supplies of key vitamins and minerals. Trade facilitation efforts will be essential to ensure that potential benefits from the AfCFTA are realized. Investments in SPS systems and capacities as well as support for traders in meeting requirements will help ensure that food safety and other SPS measures contribute to the safety of food supplies without disrupting trade.

References

Adjaye-Gbewonyo, K., S. Vollmer, M. Avendano, et al. 2019. "Agricultural Trade Policies and Child Nutrition in Low- and Middle-Income Countries: A Cross-National Analysis." *Global Health* 15: 21.

AU (African Union). 2023. CAADP Toolkit. Accessed August 19. https://au.int/en/caadp/toolkit

AUC (African Union Commission). 2019. *Sanitary and Phytosanitary (SPS) Policy Framework for Africa*. Addis Ababa.

AUC and AUDA-NEPAD (African Union Development Agency-New Partnership for Africa's Development). 2021. *Technical Guidelines: Document for Preparing Country Biennial Review Report on Progress Made for Achieving the Malabo Declaration Goals and Targets.* Draft of March 31, 2021. Addis Ababa.

AUC and AUDA-NEPAD. 2022. *3rd CAADP Biennial Review Report 2015–2021*. Addis Ababa.

Afrika, J.-G.K., and G. Ajumbo. 2012. "Informal Cross-Border Trade in Africa: Implications and Policy Recommendations." *AfDB Africa Economic Brief* 3 (10): 1–13. Abidjan: African Development Bank.

Badiane, O., J. Collins, K. Glatzel, and W. Tefera. 2022. "The Rise of Africa's Processing Sector and Commercialization of Smallholder Agriculture." In *2022 ReSAKSS Annual Trends and Outlook Report: Agrifood Processing Strategies for Successful Food Systems Transformation in Africa*, eds. C. Jenane, J. Ulimwengu, and G. Tadesse, 6–22. Kigali and Washington, DC: AKADEMIYA2063 and International Food Policy Research Institute (IFPRI).

Bailey, R.L., K.P. West Jr., and R.E. Black. 2015. "The Epidemiology of Global Micronutrient Deficiencies." *Annals of Nutrition and Metabolism* 66 (suppl 2): 22–33.

Bensassi, S., J. Jarreau, and C. Mitaritonna. 2016. *Determinants of Cross-Border Informal Trade: The Case of Benin.* AGRODEP Working Paper 34. Washington, DC: IFPRI.

Bonuedi, I., K. Kamasa, and E.E.O. Opoku. 2020. "Enabling Trade Across Borders and Food Security in Africa." *Food Security* 12: 1121–1140.

Bouët, A., and L.M. Sall. 2021. "African Participation in Global Agricultural Trade." In *Africa Agriculture Trade Monitor 2021*, eds. A. Bouët, G. Tadesse, and C. Zaki, 15–49. Kigali and Washington, DC: AKADEMIYA2063 and IFPRI.

Bouët, A., B. Cissé, and F. Traoré. 2020. "Informal Cross-Border Trade in Africa." In *Africa Agriculture Trade Monitor 2020*, eds. A. Bouët, S.P. Odjo, and C. Zaki, 119–148. Washington, DC: IFPRI.

Casari, S., M. Di Paola, E. Banci, et al. 2022. "Changing Dietary Habits: The Impact of Urbanization and Rising Socio-Economic Status in Families from Burkina Faso in Sub-Saharan Africa." *Nutrients* 14 (9): 1782.

Chen, C., A. Chaudhary, and A. Mathys. 2021. "Nutrient Adequacy of Global Food Production." *Frontiers in Nutrition* 8: 739755.

Chinyamakobvu, O.S. 2017. *The Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary (SPS) Policies of African Regional Economic Communities (RECs).* Nairobi: Pan-African Quality Infrastructure.

Cissé, F., J. Kurtz, and S. Odjo. 2020. "Intra-African Trade Integration." In *Africa Agriculture Trade Monitor 2020*, eds. A. Bouët, S.P. Odjo, and C. Zaki, 41–76. Washington, DC: IFPRI.

COMESA (Common Market for Eastern and Southern Africa). 2019. *COMESA Sanitary and Phytosanitary Programme (SPS) Annual Report 2018/9 (Draft)*. Lusaka.

Conti, M., A. Campanaro, P. Coccetti, et al. 2019. "Potential Role of Neglected and Underutilized Plant Species in Improving Women's Empowerment and Nutrition in Areas of Sub-Saharan Africa." *Nutrition Reviews* 77 (11): 817–828.

Dithmer, J., and A. Abdulai. 2017. "Does Trade Openness Contribute to Food Security? A Dynamic Panel Analysis." *Food Policy* 69: 218–230.

Dushime, A. 2021. "The Role of the AfCFTA in Improving Informal Cross-border Trade in Africa." Future Africa Forum.

EEFS (Feed the Future Enabling Environment for Food Security Project). 2021. "An Enabling Environment to Expand Trade in Fortified Foods." Agrilinks, February 16.

FAO (Food and Agriculture Organization of the United Nations). 2018. *Trade and Nutrition Technical Note 21*. Trade and Nutrition Technical Notes. Rome.

FAO. 2023a. FAOSTAT, Cost and Affordability of a Healthy Diet (CoAHD). https://www.fao.org/faostat/en/#data/CAHD.

FAO. 2023b. FAO Food Price Index dataset. Accessed August 17, 2023. https://www.fao.org/worldfoodsituation/foodpricesindex/en/

FAO. 2023c. FAOSTAT, Suite of Food Security Indicators. Accessed August 20, 2023. https://www.fao.org/faostat/en/#data/FS

Ge, J., J.G. Polhill, J.I. Macdiarmid, et al. 2021. "Food and Nutrition Security under Global Trade: A Relation-Driven Agent-Based Global Trade Model." *Royal Society Open Science* 8 (1): 201587.

Gebremedhin, S., and T. Bekele. 2021. "Evaluating the African Food Supply against the Nutrient Intake Goals Set for Preventing Diet-Related Non-Communicable Diseases: 1990 to 2017 Trend Analysis." *PLOS ONE* 16 (1): e0245241.

Geyik, O., M. Hadjikakou, and B.A. Bryan. 2020. "Spatiotemporal Trends in Adequacy of Dietary Nutrient Production and Food Sources." *Global Food Security* 24: 100355.

Geyik, O., M. Hadjikakou, B. Karapinar, and B.A. Bryan. 2021. "Does Global Food Trade Close the Dietary Nutrient Gap for the World's Poorest Nations?" *Global Food Security* 28: 100490.

Global Panel. 2020. *Rethinking Trade Policies to Support Healthier Diets*. Policy Brief No. 13. London: Global Panel on Agriculture and Food Systems for Nutrition.

Green, R., L.H. Allen, A.L. Bjørke-Monsen, et al. 2017. "Vitamin B12 Deficiency." *Nature Reviews Disease Primers* 3 (1): 1–20.

Hassen, I.W., M. Dereje, B. Minten, and K. Hirvonen. 2016. "Diet Transformation in Africa: The Case of Ethiopia." Ethiopia Strategy Support Program Working Paper 87. IFPRI, Washington, DC.

Hawkes, C. 2015. *Enhancing Coherence between Trade Policy and Nutrition Action*. United Nations Standing Committee on Nutrition Discussion Paper 1. Geneva: UNSCN Secretariat.

Hawkes, C., M. Chopra, and S. Friel. 2009. "Globalization, Trade, and the Nutrition Transition." In *Globalization and Health: Pathways, Evidence and Policy*, eds. R. Labonté, T. Schrecker, C. Packer, and V. Runnels. New York: Routledge.

Hoffmann, S., B. Devleesschauwer, W. Aspinall, et al. 2017. "Attribution of Global Foodborne Disease to Specific Foods: Findings from a World Health Organization Structured Expert Elicitation." *PLoS ONE* 12 (9): e0183641.

Hollinger, F., and J. Staatz. 2015. *Agricultural Growth in West Africa: Market and Policy Drivers*. Rome: FAO, African Development Bank, ECOWAS.

Jaffee, S., S. Henson, D. Grace, M. Ambrosio, and F. Berthe. 2020. "Why Food Safety Matters to Africa: Making the Case for Policy Action. In *2020 Annual Trends and Outlook Report: Sustaining Africa's Agrifood System Transformation: The Role of Public Policies*, eds. D. Resnick, X. Diao, and G. Tadesse, 112–129. Washington, DC, and Kigali: IFPRI and AKADEMIYA2063.

Laborde, D., and L. Deason. 2015. "Trade and Nutritional Contents." https://doi.org/10.13140/RG.2.2.13391.43688.

Majamanda, J., D. Maureen, T.M. Munkhondia, and J. Carrier. 2014. "The Effectiveness of Community-Based Nutrition Education on the Nutrition Status of Under-Five Children in Developing Countries. A Systematic Review." *Malawi Medical Journal* 26 (4), 115–118.

Makochekanwa, A., and G. Matchaya. 2019. "Regional Trade Integration in Eastern and Southern Africa." In *Africa Agriculture Trade Monitor 2019,* eds. A. Bouët and S.P. Odjo, 133–163. Washington, DC: IFPRI.

Malabo Montpellier Panel. 2020. *Trading Up: Policy Innovations to Expand Food and Agricultural Trade in Africa*. Dakar: AKADEMIYA2063.

Martin, W., and D. Laborde Debucquet. 2018. "The Free Flow of Goods and Food Security and Nutrition." In *2018 Global Food Policy Report*, 20–29. Washington, DC: IFPRI.

Maseko, I., B. Ncube, T. Mabhaudhi, et al. 2019. "Nutritional Quality of Selected African Leafy Vegetables Cultivated Under Varying Water Regimes and Different Harvests." *South African Journal of Botany* 126: 78–84.

Mbithi, S. 2019. *Harnessing Market Drivers of Food Safety*. Background paper prepared for the First FAO/WHO/AU International Food Safety Conference, Addis Ababa, February 12–13, 2019.

Minot, N. 2014. "Food Price Volatility in Sub-Saharan Africa: Has It Really Increased?" *Food Policy* 45: 45–56.

Mold, A., and S. Chowdhury. 2021. "Why the Extent of Intra-African Trade Is Much Higher Than Commonly Believed—And What This Means for the AfCFTA." Africa in Focus, Brookings Institution, May 19.

Molnar, G., and S.B. Godefroy. 2020. "Review of Mechanisms for Food Safety-Related SPS Measures within African Regional Economic Communities (RECs): Paving the Way for a Continent-wide Food Safety Coordination Effort." *Food Control* 115: 107206.

Muthayya, S, J.H. Rah, J.D. Sugimoto, F.F. Roos, K. Kraemer, and R.E. Black. 2013. "The Global Hidden Hunger Indices and Maps: An Advocacy Tool for Action." *PLOS ONE* 8 (6), e67860.

National Academies of Sciences, Engineering, and Medicine. 2019. *Dietary Reference Intakes for Sodium and Potassium*. Washington, DC: National Academies Press.

Ndemera, M., I. Gokah, and M. Gichuri. 2023. *Economic Impact of Sanitary and Phytosanitary Measures on Regional Food Trade: A Case Study of AGRA Focus Countries*. Food Trade Coalition for Africa. Nairobi: AGRA.

Nordhagen, S., E. Lambertini, C.S. DeWaal, B. McClafferty, and L.M. Neufeld. 2022. "Integrating Nutrition and Food Safety in Food Systems Policy and Programming." *Global Food Security* 32: 100593.

Odjo, S. P., and O. Badiane. 2018. "The West African Trade Outlook: Business-as-Usual Compared with Alternative Options." In *Africa Agriculture Trade Monitor 2018*, eds. O. Badiane, S.P. Odjo, and J. Collins, 131–151. Washington, DC: IFPRI.

Odjo, S.P., and C. Zaki. 2020. "Africa in Global Agricultural Trade." In *Africa Agriculture Trade Monitor 2020*, eds. A. Bouët, S.P. Odjo, and C. Zaki, 17–40. Washington, DC: IFPRI.

Pretorius, B., J.M. Muka, P.J.M. Hulshof, and H.C. Schönfeldt. 2023. "Current Practices, Challenges and New Advances in the Collection and Use of Food Composition Data for Africa." *Frontiers in Sustainable Food Systems* 7.

Ruel, M.T. 2003. "Is Dietary Diversity an Indicator of Food Security or Dietary Quality? A Review of Measurement Issues and Research Needs." *Food and Nutrition Bulletin*. 24 (2): 231–232.

Sapp, A.C., M.P. Amaya, A.H. Havelaar, and G.F. Nane. 2022. "Attribution of Country Level Foodborne Disease to Food Group and Food Types in Three African Countries: Conclusions from a Structured Expert Judgment Study." *PLoS Neglected Tropical Diseases* 16 (9): e0010663.

Shankar, B. 2017. *The Influence of Agricultural, Trade and Food Policies on Diets*. Trade Policy Technical Notes 18. Rome: FAO.

Simola, A., O. Boysen, E. Ferrari, V. Nechifor, and P. Boulanger. 2022. "Economic Integration and Food Security: The Case of the AfCFTA." *Global Food Security* 35: 100651.

Singh, S., J. Kaur, H. Ram, J. Singh, J., and S. Kaur. 2023. "Agronomic Bio-fortification of Wheat (Triticum aestivum L.) to Alleviate Zinc Deficiency in Human Being." *Reviews in Environmental Science and Biotechnology* 22 (2): 505–526.

Stevens, G.A., J.E. Bennett, Q. Hennocq, et al. 2015. "Trends and Mortality Effects of Vitamin A Deficiency in Children in 138 Low-Income and Middle-Income Countries between 1991 and 2013: A Pooled Analysis of Population-Based Surveys." *Lancet Global Health* 3 (9): e528–e536.

Siu, J. 2019. *Trade Costs, Trade Facilitation, and Formalisation of Trade: Evidence from One-Stop-Border-Posts in Uganda*. International Growth Centre Working Paper F-43435-UGA-1. International Growth Centre, London.

Thow, A. 2009. "Trade Liberalisation and the Nutrition Transition: Mapping the Pathways for Public Health Nutritionists." *Public Health Nutrition* 12 (11): 2150–2158.

Tschirley, D., T. Reardon, M. Dolislager, and J. Snyder. 2015. "The Rise of a Middle Class in East and Southern Africa: Implications for Food System Transformation." *Journal of International Development* 27 (5): 628–646.

Ulimwengu, J., L. Magne Domgho, J. Collins, and O. Badiane. 2023. *Hidden Hunger: A Global Problem with Local Solutions*. Accepted paper at the 7th African Conference of Agricultural Economists, Durban, South Africa, September 18–21, 2023. Forthcoming.

UNECA. 2018. *An Empirical Assessment of the African Continental Free Trade Area Modalities on Goods*. Addis Ababa.

UN DESA (United Nations, Department of Economic and Social Affairs) Population Division. 2022. "World Population Prospects 2022."

USDA (United States Department of Agriculture). 2023. FoodData Central. https://fdc.nal.usda.gov/

Vacu, N.P., and N.M. Odhiambo. 2020. "The Determinants of Import Demand: A Review of International Literature." *Acta Universitatis Danubius: Oeconomica* 16 (5) : 101–117.

Vincent, A., F. Grande, E. Compaoré, et al. 2020. *FAO/INFOODS Food Composition Table for Western Africa (2019) User Guide and Condensed Food Composition Table*. Rome: FAO.

Wang, Y., and A. Sarkar. 2022. "Evaluating the Influencing Factors of Food Imports Within Belt and Road Initiatives (BRI) Countries: An Economic Threshold Model Approach." *Frontiers in Sustainable Food Systems* 6.

WHO (World Health Organization). 2018. "Listeriosis: South Africa." *Disease Outbreak News*, March 28.

Wood, S.A., M.R. Smith, J. Fanzo, R. Remans, and R.S. DeFries. 2018. "Trade and the Equitability of Global Food Nutrient Distribution." *Nature Sustainability* 1: 34–37.

World Bank. 2020. *The African Continental Free Trade Area: Economic and Distributional Effects*. Washington, DC.

World Bank. 2022. *Food Safety in Africa: Past Endeavors and Future Directions*. Washington, DC.

Zhou, J.R., and J.W. Erdman. 1995. "Phytic Acid in Health and Disease." *Critical Reviews in Food Science and Nutrition* 35 (6): 495–508.

Appendix

Appendix 3.1 Sensitivity Analysis on the Food Composition Tables

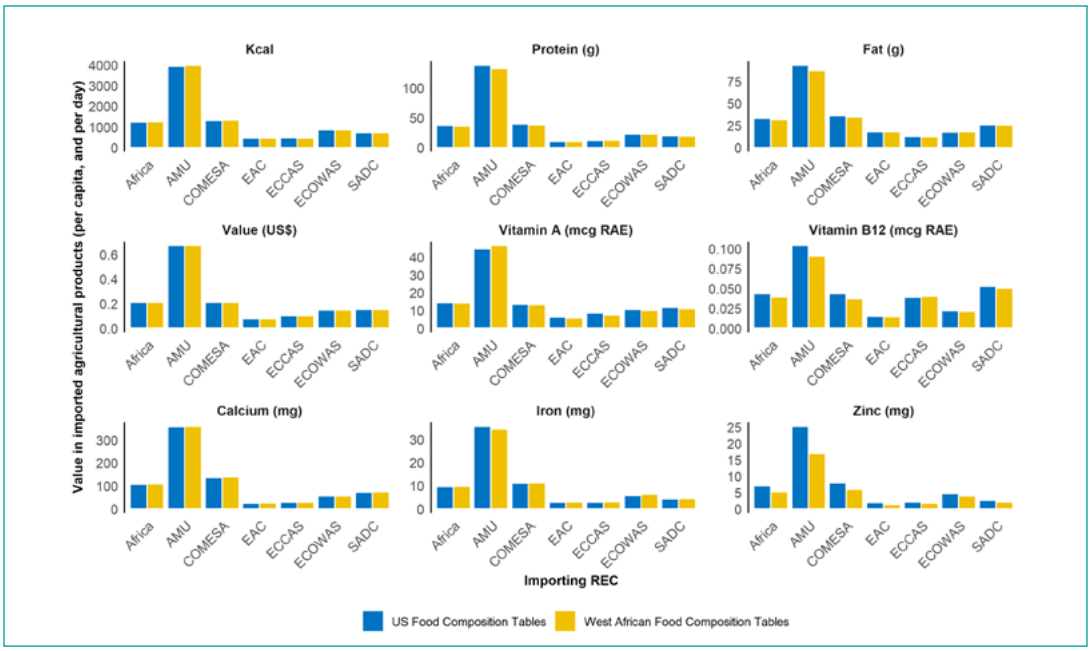
The analysis of trade flows' nutritional content in this chapter relies on US food composition tables (USDA 2023). However, regional differences exist in food composition. To evaluate the impact of this limitation on our results, we conducted a sensitivity analysis using food composition tables specific to West Africa (Vincent et al. 2020). These are not entirely applicable to other African regions due to the regional differences across the continent. Nevertheless, the comparison of results obtained from the two food composition tables offers valuable insights, highlighting nutrients with significant variations and emphasizing the need for further research.

The sensitivity analysis covers more than 70 percent of global imports and 70 percent of intra-African imports in terms of quantity across all regions for 2021. In instances where the HS6-coded product lacked corresponding values in the West African food composition tables, the nutrient content data from the US tables were employed.

The values obtained from the US food composition tables and those from the West Africa tables do differ. However, the relative levels of nutrient trade of the various RECs remains consistent, so the assessment of the REC with the least nutrient-rich trade content remains the same (Figure A3.1). For content in calories, proteins, fats, and calcium, the values are quite similar (within a 7 percent range across all RECs). There are slightly more variations for iron (within a 9 percent range), vitamin A (within a 13 percent range) and vitamin B12 (within a 14 percent range). Values obtained for zinc differ substantially, with a systematic overestimation of the zinc content from the US food composition tables. Specifically, the value derived from the West African tables is at least 17.5 percent lower than the value obtained with the US tables across all RECs. This overestimation of zinc content could be attributable to soil deficiencies in zinc in Africa, as highlighted by Singh et al. (2023). At the country level, the same conclusions can be drawn: the findings remain relatively consistent across all nutrients, except for zinc, for which there is a systematic overestimation using the US tables.[10]

10 Detailed country-level results are available from the authors upon request.

Figure A3.1. Nutrient content of agricultural imports, according to US and West African food composition tables, by REC, 2021



Source: Authors based on the 2023 AATM database.

CHAPTER
FOUR

Competitiveness of the Cotton Value Chain in Africa

Leysa M. Sall, Sunday Odjo, and
Chahir Zaki

Introduction

Cotton production and trade have a long history and important role in Africa, dating back centuries before the colonial period. While the sector saw several developments in the post-colonial period, cotton trade remained primarily in unprocessed cotton because of several structural challenges affecting its production. Moreover, African exports of cotton have decreased in recent years from a total annual average of US$55 billion[1] in the 2006–2010 period to $48 billion in the 2017–2021 period. At the same time, cotton imports increased by 37 percent, up from $37 billion to $51 billion, making Africa a net importer in the later period. At the value chain level, unprocessed cotton products have the lion's share in the export market, accounting for about 12 percent of global exports of raw cotton during the 2017–2021 period. Africa's semi-processed and processed cotton product exports account for 2 percent and 3 percent, respectively, for the same period. In addition, African imports of processed cotton increased as a share of world cotton trade (from 3 percent to 4 percent) over the two periods.

Against this background, this chapter has three objectives. First, it provides a comprehensive analysis of the competitiveness of the cotton value chain among African countries, compared with their top non-African competitors. Second, it identifies the comparative advantage of African countries by using a new revealed comparative advantage (RCA) index that relies on an econometric approach suggested by Costinot et al. (2012). Third, it analyzes the challenges and opportunities affecting cotton trade in Africa. In fact, while there is clearly potential for the cotton value chain, production faces several bottlenecks related to production potential (lack of R&D, weak productivity, informal employment, child labor, and climate change); the trade policies of Africa's main trade partners (tariffs and nontariff measures); and Africa's competitors.

The chapter is organized as follows. The next section reviews the historical background of cotton trade and production in Africa. The following section analyzes the main trends observed for the trade in African cotton by level of processing and looks at competitiveness and country performances. Finally, we evaluate the opportunities and challenges facing trade in cotton, and offer policy recommendations in the conclusion.

Historical Background

In today's geography of African cotton, West and Central Africa comprise the continent's largest area of cotton production, having replaced Egypt and East Africa, which were the leading cotton basin in the 1960s. To gain insight into the developments that have shaped current production patterns, this section provides a historical review of cotton production in Africa. It tracks the changes introduced over time in the organization and performance of the cotton sectors of Africa's major cotton-producing countries, focusing on differences between the former French colonies of West and Central Africa (WCA) and British and Portuguese colonies of East and Southern Africa (ESA).

Cotton sectors in the colonial period

Cotton production and trade in Africa can be traced back centuries before the colonial administration of the continent. However, cotton sector development across African countries really took off during the colonial period. In WCA countries, cotton was promoted by the French colonial government in search of alternative sources of raw cotton for the French textile industry, which was highly dependent on imports from the United States (Delpeuch 2009). The Compagnie Française de Développement des Fibres Textiles (CFDT) was created to organize the cotton supply chain, from input supply to farmers to the marketing of cotton lint. CFDT

1 Throughout this volume, $ refers to US dollars.

operations were conducted from Cameroon, Madagascar, Morocco, Senegal, and the Central African Republic. It is credited with developing cotton supply chains (*filières*) in French colonies in WCA through the establishment of cotton gins and oil mills; improving yields and cultivated areas; and large-scale distribution of the necessary equipment for cotton cultivation.

Similarly, cotton was promoted in ESA by the colonial administrations of the region. In Uganda and Tanzania, smallholder households depended on cotton production because it was the only crop that could generate cash to pay the poll tax, which was enforced to supply the British textile industry with raw cotton (Baffes 2009). In contrast to WCA, private actors were strongly involved in cotton sector development in ESA during the colonial period. For instance, seed cotton (raw cotton) purchase and ginning were controlled by Asian businessmen in most ESA countries, while the colonial governments were in charge of other critical functions, including research and extension, seed development, quality control, and lint export.

Cotton sector development was based on smallholder farms in both WCA and ESA regions, with the exceptions of Mozambique and Zimbabwe, where large-scale farmers of European origin were involved in cotton production for at least part of the colonial period (that is, between 1965 and 1975 in Mozambique, and at least until 1980 in Zimbabwe) (Tschirley et al. 2009).

Cotton sectors in early post-independence years

Shortly after independence, some structural changes were introduced in the management of cotton sectors in Africa. In francophone WCA countries, CFDT was replaced by national companies in which CFDT still owned some shares while the majority of shares were held by the new governments.[2] Like CFDT, these companies controlled all critical functions, while enjoying monopoly and monopsony powers for input distribution, seed cotton purchase and ginning, and cotton lint marketing and exports. Their only obligation was to purchase all seed cotton produced at a fixed, pan-territorial price, which was set by the government and announced before planting. In addition to expanding their ginning capacity, the national cotton companies developed input credit schemes, strengthened extension services, developed new seed varieties and animal traction, and invested in seed cotton and lint transportation and in large-scale cottonseed processing units for refined oil production.

In ESA countries, the post-independence years were marked by increased government control of the cotton sector. Government or government-controlled organizations—such as farmer cooperative unions in Uganda and Tanzania—were granted monopoly rights for seed cotton purchase and ginning, to the detriment of Asian businessmen. In both countries, cooperatives were regulated by national companies, namely the Uganda Lint Marketing Board and the Tanzania Cotton Authority, which continued to handle the marketing of cotton lint and seed as in the colonial period.

The early post-independence decades (1960–1990) brought significant development of cotton sectors in WCA as a result of the institutional changes and investments. Achievements included an increase of the number of cotton farmers, expansion of cotton cultivation areas, and improvement in seed cotton yield, ginning outturn ratios, and lint quality. The resulting increase in cottonseed production triggered investments in large-scale cottonseed processing units to supply domestic markets with quality refined oil (Tschirley et al. 2009).

2 The national cotton companies include the Société Nationale pour la Promotion Agricole (Sonapra) in Benin, the Société de Développement du Coton (Sodecoton) in Cameroon, the Compagnie Ivoirienne pour le Développement des Textiles (Cidt) in Côte d'Ivoire, the Société Burkinabè des Fibres Textiles (Sofitex) in Burkina Faso, the Compagnie Malienne pour le Développement des Textiles (Cmdt) in Mali, the Société Centrafricaine de Développement Agricole (Sonada) in the Central African Republic, CotonTchad in Chad, the Société Togolaise du Coton (Sotoco) in Togo, and the Société de Développement et des Fibres Textiles in Senegal (Sodefitex).

In contrast, the performance of the cotton sector declined in ESA during these decades, except in Zimbabwe. Poor policies and mismanagement of cotton sectors led to a drop in lint production by both large-scale and smallholder farms, mounting debts and delayed payments to farmers, and a decline in lint quality. Many factors contributed to the better performance in Zimbabwe. These included the introduction of high-yielding seed varieties and effective chemical control of red bollworm; inclusion of representatives of the Rhodesian National Farmers Union in the coordination board[3] of the country's Cotton Marketing Board; and support of smallholder producers with extension services, a credit scheme for production expansion, and a guaranteed minimum cotton price announced before planting (Poulton and Hanyani-Mlambo 2007). The contribution of smallholder farmers to national cotton production rose from 40 percent in 1988 to 60 percent in 1994 and 90 percent in 2001.

Cotton sector liberalization reforms

In the WCA region, cotton eventually became a victim of its own success. In fact, cotton companies grew faster than their management capacities. This resulted in cost inefficiencies and severe financial problems in a context marked by declining world prices, government-controlled producer prices, and an overvalued local currency. Financial difficulties were further exacerbated by political interference in the management of cotton companies, namely pressure exerted to extract resources from the companies to finance private or public expenditures. By the end of the 1980s, further structural reforms of the WCA cotton sectors, as well as the broader economy, became inevitable. Reforms started with the devaluation of the CFA franc in 1994, which occurred while world cotton prices were surging. These reforms were followed during the 1990s by changes in the organization and governance of the cotton sectors, particularly in Benin and Burkina Faso, including the following (Tschirley et al. 2009):

- Empowerment and involvement of cotton farmer associations and their regional and national unions in the delivery of critical services and functions, with the hope that they can later co-manage the sector with the cotton companies and reduce government direct involvement.[4]
- Entry of private actors into ginning or input supply activities in Benin in 1995 and Burkina Faso in 2004, though private investors were not allowed to compete for the supply of seed cotton.
- Creation of "inter-professional committees" for the cotton sector in Benin in 1999 and in Burkina Faso in 2006, and their empowerment to replace the government in the regulation of the relationships between stakeholders in the cotton sector.
- Adoption of a price-setting mechanism linked to world prices and to a stabilization fund to support producer prices when the world market price is low, and to be replenished when the world market price is high.

While these institutional and organizational reforms were necessary, sector liberalization was not complete. The efforts to involve farmer unions in the management of cotton sectors were successful across West Africa. The unions were given a 20 percent share in the capital of the privatized cotton companies in Burkina Faso. Farmer unions were also involved in the management of competitive bids for input imports and distribution in Mali, Benin, and Cameroon; and were transferred responsibility for extension services in Benin, Cameroon, and Burkina Faso. However, only three cotton companies were privatized in Burkina Faso, two of which (Socoma and Faso Coton) represented only 15 percent of the national ginning activity,

3 Agricultural Marketing Authority.
4 The following unions of farmer associations were created: the Fédération des Unions de Producteurs du Bénin (FUPRO) in Benin in 1993, the Union Nationale des Producteurs de Coton du Burkina (UNPCB) in Burkina Faso in 1998, and the Organisation des Producteurs de Coton du Cameroun (OPCC) in Cameroon in 2000.

while Sofitex, the largest ginner, is a parastatal, with 35 percent of capital belonging to the government. In Benin, Sonapra, another parastatal, remained the largest ginner, accounting for 50 percent of the national seed cotton ginned, despite the entry of eight private ginners in the sector following the reforms (Gergely 2009). The inter-professional committees remain weak and the government continues to interfere in decision-making processes. Stabilization funds worked well in Cameroon, Burkina Faso, Benin, and Mali until 2004, when world prices started to fall. Then, they could not sustain the high prices farmer unions had secured with cotton companies, and were soon exhausted. In Benin and Mali, direct government subsidies had to be used to cover payments due to cotton producers.

Structural reforms were deeper in ESA compared with WCA, in particular with respect to the entry of private investors. In Mozambique, at least 12 fully private cotton companies were granted monopoly rights for seed cotton purchase within exclusive concession areas between 1990 and 2002. The number of private seed cotton buyers and ginners reached 30 in Tanzania and 27 in Uganda in the 2001/02 marketing season (Poulton et al. 2004). The privatization of the parastatal companies that controlled the whole cotton supply chain resulted in 1995 in a duopoly in Zimbabwe, CottCo[5] and Cargill, as well as in Zambia, Lonrho and Clark Cotton, the latter two operations being subsequently sold to Dunavant and Cargill, respectively. Despite the arrival of new competitors in 2001/02, the duopolies continue to dominate the cotton sectors of these two countries.

Sector performance improved significantly in ESA in the early post-liberalization years (Poulton et al. 2004). Privatization preserved the smallholder-based production system along with the preexisting input credit scheme in Zimbabwe. Expansion of production in Zambia was associated with increases in yield and the number of farmers, and with an effective system of input distribution, credit recovery, and extension advice introduced by Dunavent. In these two countries where the cotton sectors remained concentrated after the reforms, the quality of cotton sold in international markets was also preserved. In contrast, Uganda and Tanzania, where the sectors became more competitive, were not successful in supporting cotton farmers with input credit and extension services, and lint quality declined in Tanzania.

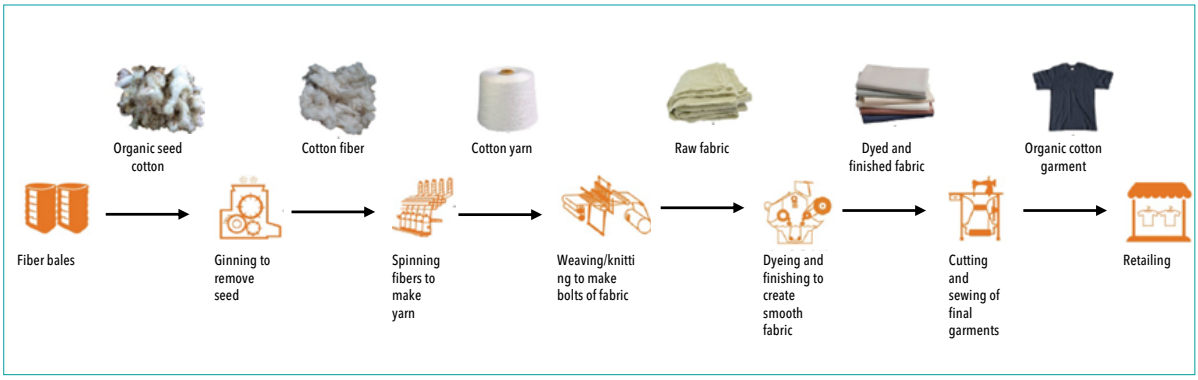
Today, the following three types of cotton sector organizational models characterize the larger cotton-producing countries in Africa (Tschirley et al. 2010; Peltzer and Rottger 2013): (1) the national or regional concession model, where a company is granted monopoly rights but also the obligation to purchase all seed cotton production across the whole country or within a region of the country, using a single marketing channel for inputs and outputs; (2) the concentrated competition model, in which a few dominant companies compete along with smaller ones while farmers can choose which cotton company to sell to; and (3) the competitively structured system, in which many ginners compete for market share but no subset of them has a dominant position. The first model is found in Burkina Faso, Cameroon, Mali, and Mozambique. The concentrated competition model fits Zimbabwe and Zambia and is also found in Côte d'Ivoire, the Democratic Republic of the Congo, Ghana, and Nigeria. The competitively structured model characterizes Tanzania and Uganda. In sum, the national or regional concession model that integrates farmer organizations has proven more effective than the fully liberalized system in dealing with market failures and providing research and extension services, input credit, and crop insurance in a context of risk-averse smallholder producers.

5 Cotton Company of Zimbabwe, Ltd.

Overview of Trade in Cotton

This section provides an overview of trade patterns and performance in the cotton value chain. We examine the structure of the value chain in terms of three levels of cotton processing illustrated in Figure 4.1: unprocessed (seed cotton), semi-processed (fibers and yarns), and processed (finished fabrics and garments). Further, we analyze Africa's participation in the cotton value chain and look at the performance of leading exporters and partners using the revealed comparative advantage index based on estimations recently developed by Costinot et. al (2012).

Figure 4.1 Cotton processing stages



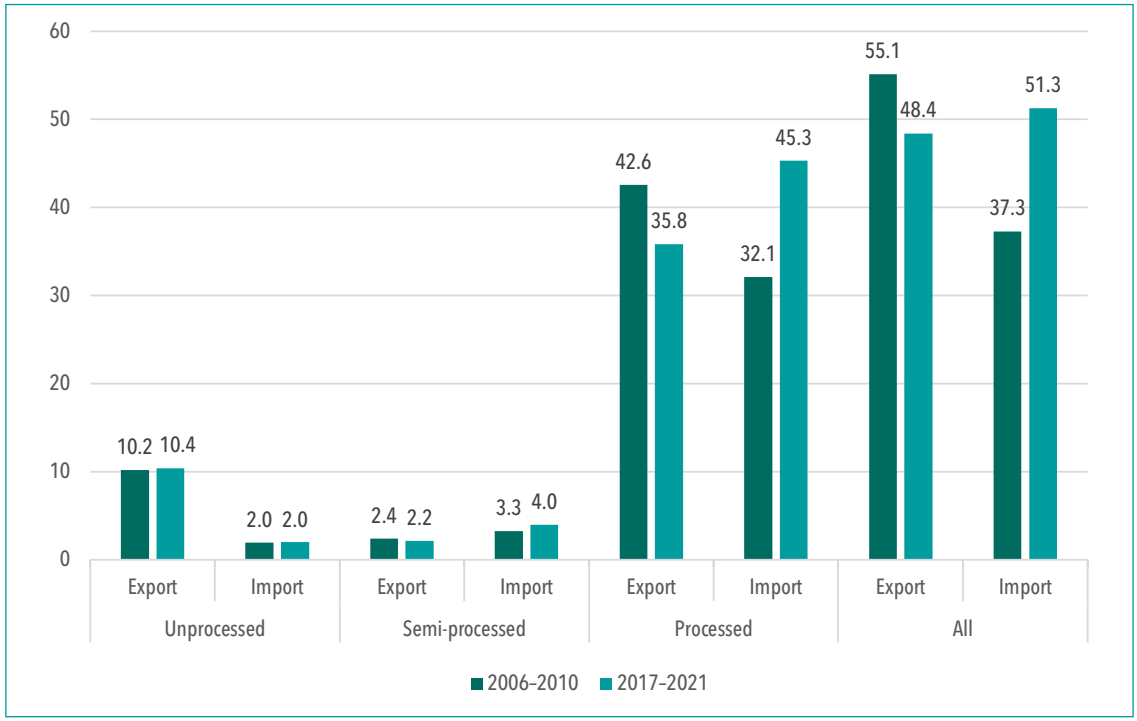
Source: Textile Exchange (2018a).

Trade flows by level of processing

Figure 4.2 shows the evolution of African exports and imports of cotton products by level of processing. Exports of cotton have decreased by 12 percent, from an annual average value of $55.1 billion in the 2006–2010 period to $48.3 billion in the 2017–2021 period. This is mainly driven by trends observed in processed cotton products[6] such as trousers, overalls, shorts, t-shirts, shirts, and blouses, for which exports decreased by around 30 percent. In contrast, imports saw a sharp increase of 37 percent between the two periods, mainly driven by textiles and clothing goods. Overall, while the continent was a net exporter in 2006–2010 with a balance of $6.7 billion, the trade balance for cotton products fell to −$2.9 billion in the 2017–2021 period, making the continent a net importer. The negative trade balance means that Africa's currency flows outward to pay for cotton and the continent is reliant on foreign cotton goods.

6 HS-6 lines associated are respectively HS 620342, HS 610910, and HS 620630.

Figure 4.2 African exports and imports of cotton, by level of processing, 2006–2010 and 2017–2021 averages (US$ billions)

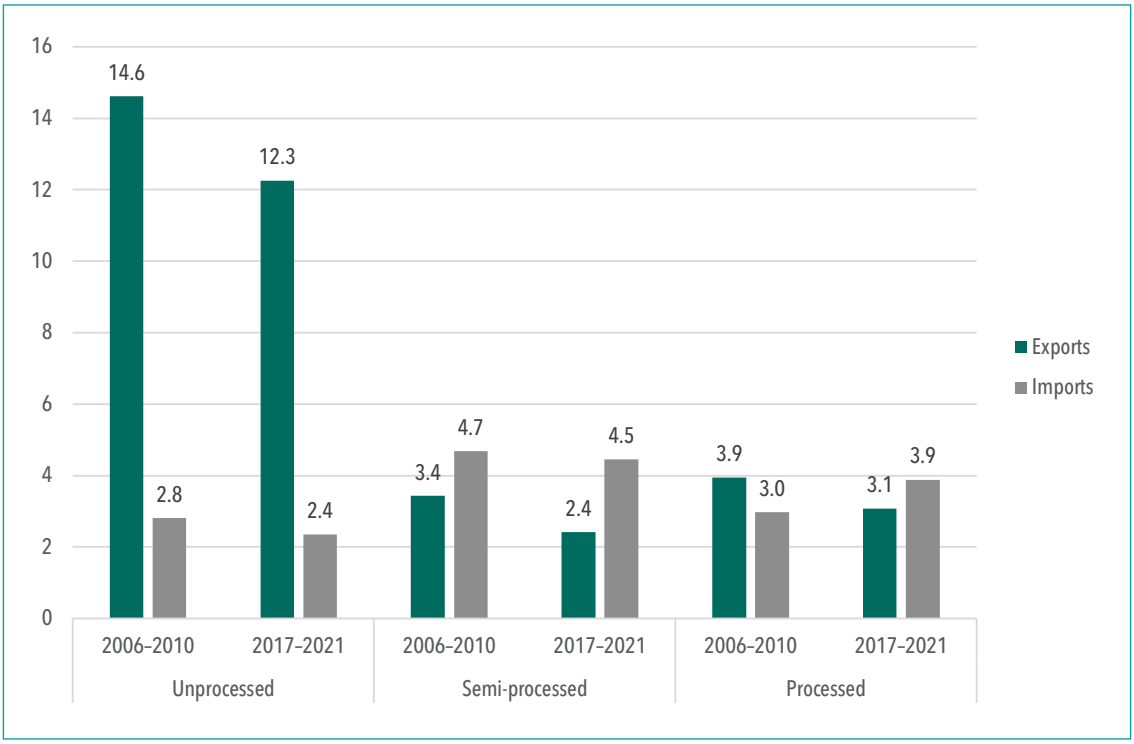


Source: 2023 AATM database.

Structure by level of processing

The participation of Africa in world cotton trade has been relatively limited over the years both on the import and the export side. Unprocessed products, including cottonseeds, cotton linters, cotton not carded or combed, and cotton waste, are the products most represented in the export market, accounting for around 12 percent of world exports of unprocessed cotton in the 2017–2021 period. Africa's exports of semi-processed products accounted for 2 percent and processed cotton products for 3 percent of corresponding world exports in the same period. It is worth noting that the participation of Africa in world exports decreased between the two periods by 2 percentage points for unprocessed cotton, 1 percentage point for semi-processed, and 0.8 percentage points for processed cotton. On the import side, the continent is not a big player, with a market share between 2 and 5 percent in both periods. However, Africa's share in world imports of processed cotton increased (from 3 to 4 percent) between the two periods (Figure 4.3).

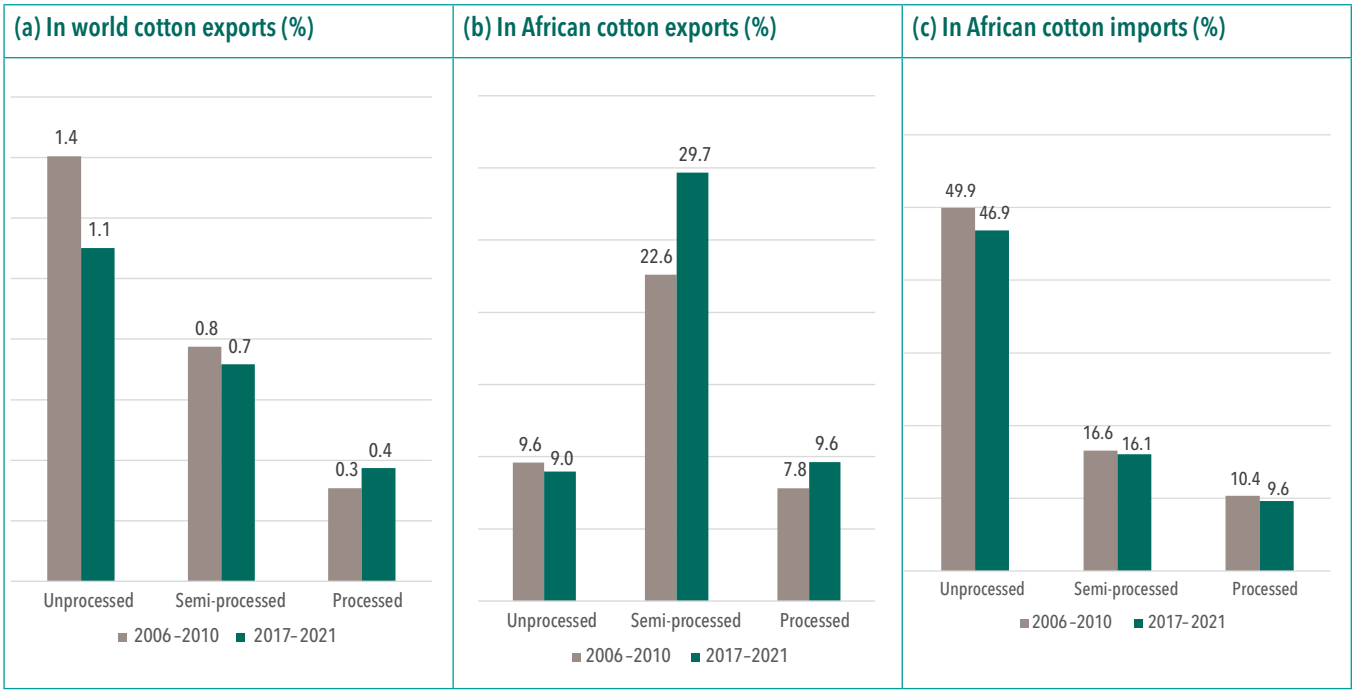
Figure 4.3 Share of African cotton exports and imports in cotton world trade, 2006–2010 and 2017–2021 averages (%)



Source: 2023 AATM database.

To complement the picture of global trade flows, Figure 4.4 captures the importance of intraregional trade at the different levels of processing compared with world and African trade flows. Intra-African trade represents a small share of world trade and accounts for around 1 percent or less for each of the different stages of processing (Panel A). However, there is significant intraregional export potential to tap. African clothing producers export more for brands outside the continent than within: for example, in the second period only 9 percent of exports of raw cotton and 9.6 percent of processed cotton were destinated to Africa (Panel B). Semi-processed products destined to Africa include carded and combed cotton and cotton yarn and represented around 30 percent of African cotton exports between 2017 and 2021. Finally, around half of African imports of raw cotton are coming from within the region, while foreign brands are the main providers of fabrics, clothing, and other cotton textiles (Panel C).

Figure 4.4 Share of intra-African trade, 2006–2010 and 2017–2021 averages



Source: 2023 AATM database.

Main trade actors in the cotton value chain

Identifying the key players in the cotton value chain can provide useful insights into countries' strengths, and into opportunities to engage in international trade and improve regional and global trade. We identify leading exporters both within and outside Africa as well as the main market opportunities for African countries.

Leading exporters

Table 4.1 shows the countries that exported the most cotton products by value from 2017 to 2021. China is the leading exporter of processed cotton, accounting for more than a quarter of world exports at this level of processing. Other big exporters of manufactured cotton products include Bangladesh, India, Türkiye, Pakistan, Viet Nam, Italy, Germany, Cambodia, and Spain with export shares ranging from 1 to 13 percent. Beyond these countries, Uzbekistan, Indonesia, Hong Kong, and Thailand appear as major players in trade of semi-processed cotton, with a total share of 13 percent of global trade.

Raw cotton trade accounted for a tiny share (6 percent) of trade in the entire value chain. It is mainly exported by the United States (37 percent), Brazil (15 percent), India (12 percent), Australia (8 percent), and Greece (4 percent). Benin, Burkina Faso, and Côte d'Ivoire, the three largest cotton-producing countries in Africa, which account for about 38 percent of the region's production (FAOSTAT 2021), are also among the leading world exporters of raw cotton.

Table 4.1 Top 10 exporters of cotton by value, by level of processing, 2017–2021

	Unprocessed		Semi-processed		Processed		All	
Rank	Country	Share (%)	Country	Share (%)	Country	Share (%)	Country	Share (%)
1	USA	37.0	India	21.6	China	26.0	China	23.3
2	Brazil	14.9	Viet Nam	16.6	Bangladesh	12.1	Bangladesh	10.5
3	India	11.9	US	10.7	India	6.9	India	8.2
4	Australia	8.2	China	9.3	Türkiye	6.1	Türkiye	5.7
5	Greece	3.6	Pakistan	6.3	Pakistan	4.8	Viet Nam	5.3
6	Benin	2.9	Uzbekistan	5.7	Viet Nam	4.8	Pakistan	4.6
7	Burkina Faso	2.4	Indonesia	4.3	Italy	3.7	US	4.0
8	Côte d'Ivoire	1.7	Türkiye	4.1	Germany	3.5	Italy	3.3
9	Türkiye	1.7	Hong Kong	1.7	Cambodia	2.4	Germany	3.2
10	Uzbekistan	1.5	Thailand	1.4	Spain	1.8	Cambodia	2.1
Total share of top 10 exporters		85.8		81.7		72.1		70.2

Source: 2023 AATM database.

Table 4.2 shows the top 10 largest African exporters of cotton by level of processing for the 2017–2021 period. West African cotton producers such as Benin, Burkina Faso, Côte d'Ivoire, Mali, and Togo are the largest exporters of raw cotton with $6.75 billion in value and 65 percent of total raw cotton exports. However, when it comes to textiles and more processed goods, North African countries including Morocco, Egypt, and Tunisia have combined exports of $26.05 billion, representing almost three-quarters of African exports. Textiles and clothing are thus among the leading exports of North Africa. The top West African producers highlighted above are mainly trading at the upstream stage of the value chain with less value addition.

Table 4.2 Top 10 African exporters of cotton (worldwide), by level of processing, 2017–2021

Rank	Unprocessed			Semi-processed			Processed			All		
	Country	Share of world exports	Share of African exports	Country	Share of world exports	Share of African exports	Country	Share of world exports	Share of African exports	Country	Share of world exports	Share of African exports
1	Benin	2.9	23.5	Egypt	1.0	41.2	Morocco	0.8	27.0	Morocco	3.6	20.0
2	Burkina Faso	2.4	19.6	Benin	0.2	9.1	Tunisia	0.8	24.8	Egypt	3.4	18.9
3	Côte d'Ivoire	1.7	13.7	Mali	0.2	7.7	Egypt	0.6	20.9	Tunisia	3.3	18.4
4	Egypt	0.9	7.4	Tanzania	0.2	7.3	Mauritius	0.2	7.7	Mauritius	1.1	6.1
5	Sudan	0.7	5.9	Mauritius	0.2	6.7	Madagascar	0.2	5.0	Benin	1.0	5.6
6	Mali	0.6	4.6	Uganda	0.1	5.2	Kenya	0.1	2.9	Burkina Faso	0.8	4.4
7	Cameroon	0.5	4.1	Burkina Faso	0.1	5.1	Lesotho	0.1	2.7	Madagascar	0.7	3.7
8	South Africa	0.5	4.1	Lesotho	0.1	3.7	Ethiopia	0.1	2.4	Côte d'Ivoire	0.6	3.1
9	Togo	0.4	3.6	South Africa	0.1	3.7	South Africa	0.1	2.3	South Africa	0.5	2.7
10	Tanzania	0.4	3.2	Mozambique	0.1	2.3	Eswatini	0.1	2.1	Kenya	0.4	2.2
Total share of top 10 exporters		11	89.7		2.3	92		3.1	97.8		15.4	85.1

Source: 2023 AATM database.

Top 10 importers of African cotton products

The major importers of African raw cotton are primarily Asian countries, which receive more than 70 percent of total African exports of raw cotton. These countries include Bangladesh (18 percent), China (13 percent), India (11 percent), Pakistan (10 percent), Singapore (8 percent), Viet Nam (7 percent), and Indonesia (4 percent) (Table 4.3). European and African countries import a small share of African raw cotton; of African countries, only Egypt appears among the top 10 importers, with a 3.8 percent share during the 2017–2021 period. In contrast, for processed cotton, including apparel, filters and padding, and home furnishings, Africa's main partners are the United States and European countries. Eight European countries are major partners and import more than 60 percent of African processed cotton exports. Within Africa, South Africa is the major importer for Africa's semi-processed and processed cotton, with market shares of 31 and 54 percent, respectively; and Egypt is the top intra-African importer of raw cotton.

Table 4.3 Top 10 importers of African cotton exports, by level of processing, 2017–2021

Rank		Unprocessed		Semi-processed		Processed	
		Country	Share of African cotton exports to the world (%)	Country	Share of African cotton exports to the world (%)	Country	Share of African cotton exports to the world (%)
World Importers	1	Bangladesh	18.3	Italy	12.8	USA	16.1
	2	China	12.7	Türkiye	9.4	France	13.3
	3	India	11.0	South Africa	9.2	Spain	11.8
	4	Pakistan	9.9	Bangladesh	6.9	Germany	10.2
	5	Singapore	7.6	China	4.4	Italy	7.8
	6	Viet Nam	6.5	Pakistan	4.3	South Africa	6.6
	7	Switzerland	6.1	India	3.8	Türkiye	3.1
	8	Türkiye	5.1	Nigeria	3.6	Netherlands	2.9
	9	Indonesia	4.2	Portugal	3.5	United Kingdom	2.4
	10	Egypt	3.8	Eswatini	3.5	Poland	2.0
Rank		Country	Share of intra-African cotton trade (%)	Country	Share of intra-African cotton trade (%)	Country	Share of intra-African cotton trade (%)
African Importers	1	Egypt	42.0	South Africa	31.0	South Africa	54.2
	2	Mauritius	19.7	Nigeria	12.1	Madagascar	5.6
	3	South Africa	13.9	Eswatini	11.7	Namibia	5.0
	4	Lesotho	6.9	Kenya	6.8	Tunisia	4.8
	5	Mali	5.7	Senegal	6.2	Lesotho	3.6
	6	Togo	2.0	Botswana	5.5	Morocco	3.5
	7	Mozambique	1.1	Mauritania	4.8	Eswatini	3.3
	8	Ghana	1.1	Mali	4.6	Botswana	2.9
	9	Kenya	1.1	Lesotho	2.8	Côte d'Ivoire	2.0
	10	Algeria	1.1	Madagascar	2.1	Kenya	1.6

Source: 2023 AATM database.

Where is Africa buying its cotton products?

Greece, a major cotton grower in Europe, is the main partner for Africa, which imports $563 million in raw cotton (28 percent of African imports) from the country (Table 4.4). Other major sources of African raw cotton imports include the United States (10 percent), India (4 percent), and Spain (4 percent), as well as African partners including Sudan, Benin, Zambia, Burkina Faso, Zimbabwe, and South Africa. Identifying these main import partners illustrates Africa's heavy dependence on imports from outside the continent and the low level of intra-African trade. The top African importers of unprocessed cotton from outside the continent are North African countries. On average between 2017 and 2021, Egypt alone accounted for 89 percent of Africa's imports of unprocessed cotton from Greece and 86 percent from the United States. Morocco and Algeria account for 61 and 36 percent, respectively, of the continent's imports from Spain.

Similarly, as far as manufactured products are concerned, highly industrialized Asian and European countries such as India, China, and Türkiye are the main actors exporting to Africa and have some preferential market access. Clearly, there is great potential for downstream value addition in Africa's cotton industry.

Table 4.4 Top 10 exporters of cotton to Africa, by level of processing, 2017–2021

Rank		Unprocessed		Semi-processed		Processed	
		Country	Share of African imports from the world (%)	Country	Share of African imports from the world (%)	Country	Share of African imports from the world (%)
World Exporters	1	Greece	28.3	India	35.5	China	48.4
	2	USA	10.1	Türkiye	11.5	India	8.8
	3	Sudan	9.2	China	8.4	Türkiye	7.4
	4	Benin	8.0	USA	7.5	France	3.0
	5	Zambia	7.3	Indonesia	3.4	Italy	2.9
	6	Burkina Faso	5.0	Pakistan	2.7	Austria	2.9
	7	India	4.4	Mauritius	2.4	Pakistan	2.8
	8	Spain	4.0	Benin	2.3	Spain	2.2
	9	Zimbabwe	3.6	Uzbekistan	2.3	Mauritius	2.0
	10	South Africa	3.3	Italy	2.1	South Africa	1.7
Rank		Country	Share of intra-African trade (%)	Country	Share of intra-African trade (%)	Country	Share of intra-African trade (%)
African Exporters	1	Sudan	19.7	Mauritius	14.9	Mauritius	21.1
	2	Benin	17.0	Benin	14.2	South Africa	17.9
	3	Zambia	15.6	Lesotho	12.5	Eswatini	17.1
	4	Burkina Faso	10.6	South Africa	11.2	Lesotho	10.4
	5	Zimbabwe	7.8	Burkina Faso	11.1	Egypt	8.5
	6	South Africa	7.1	Tanzania	7.0	Madagascar	8.3
	7	Côte d'Ivoire	6.2	Zimbabwe	5.7	Tanzania	2.7
	8	Mozambique	4.7	Mozambique	5.4	Morocco	2.2
	9	Uganda	1.8	Mali	4.7	Togo	2.1
	10	Tanzania	1.5	Zambia	3.8	Botswana	1.7

Source: 2023 AATM database.

Comparative advantage and country performances

Analytical framework

This section looks at the performance of leading cotton exporters using a revealed comparative advantage (RCA) index based on an econometric approach recently suggested by Costinot et al. (2012) and further elaborated by Leromain and Orefice (2013). This approach presents several advantages because it fits the Ricardian idea of comparative advantage, as opposed to the traditional Balassa RCA index, which is computed using observed trade flows, thus mixing up external and internal factors influencing trade flows. Per Ricardo, comparative advantage is based on the intrinsic (ex ante) ability of a country to be more efficient in the production of some goods. Thus, we selected the methodology adjusted by Costinot et al. (2012), which allows the identification of exporter-specific effects driving trade flows. The model allows us to purge trade flows from all other factors than innate productivity.

Estimations are based on the following equation including country-pair fixed effect (i, j), an importer-industry fixed effect (j, k), and an exporter-industry fixed effect (i, k):

$$\ln(x_{i,j,k}) = \delta_{i,j} + \delta_{j,k} + \theta \ln(z_{i,k}) + \epsilon_{i,j,k} \qquad (1)$$

Where:

i, *j* and *k* indicate respectively exporter, importer, and industry. For this specific case, industry refers to cotton products at the HS4 level disaggregated by level of processing to have a better idea of countries' performance at different levels of processing. The 239 cotton HS6 lines are grouped into 62 products depending on the HS4 parent code and the level of processing. The RCA index indicates if the countries have a comparative advantage in a specific product in the cotton value chain without any comparison with other agricultural products.

$x_{i,j,k}$ is trade flow from country i to country j of industry k.

$\delta_{i,j}$ are country-pair fixed effects.

$\delta_{j,k}$ are importer-industry fixed effects.

$z_{i,k}$ is a proxy for the productivity level of country i in sector k. A key assumption is that $z_{i,k}$ is randomly drawn from a Fréchet distribution. It captures factors related to cross-country variation of productivity such as climate, infrastructure, and institution that affect all producers in each country and industry. The parameter θ is the intra-industry productivity heterogeneity and is from the Fréchet distribution of productivity. The parameter reflects the change in technological know-how across products.

As in Costinot et al. (2012), we assume θ as common to all countries and industries. The default value $\theta = 6.53$ estimated by Costinot et. al (2012) is used and assumed constant for all sectors. Since, the realization of random $z_{i,k}$ is ex ante unknown, we approximate the technological differences by an exporter-industry fixed effect in the empirical counterpart of equation (1) as follows:

$$\ln(x_{i,j,k}) = \delta_{i,j} + \delta_{j,k} + \delta_{i,k} + \epsilon_{i,j,k} \qquad (2)$$

Using OLS estimations, we obtain

$$z_{i,k} = e^{\frac{\delta_{i,k}}{\theta}}. \qquad (3)$$

The final RCA index is normalized using a group reference made of major exporters of cotton from 2017 to 2021. The normalized weighted index is defined as follows:

$$RCA_{i,k} = \frac{z_{i,k} z_{.\,.}}{z_{i\,.} z_{.\,k}}$$

RCA scores greater than one indicate that a country has a revealed comparative advantage in the product.
Where $z_{..}$ is the average of all $z_{i,k}$ coefficients across all industries and countries, $z_{i.}$ is the average of $z_{i,k}$ for the country i across all sectors and $z_{.k}$ is the average of $z_{i,k}$ for the sector k across all exporters.

Because of technical constraints, we restricted the regression to specific countries including a set of major exporters. The top 15 exporters of cotton products by each level of processing for the years 2019, 2020, and 2021 have been used to allow for variety. Finally, Table 4.5 below lists export countries and partners included in the estimation. Importers cover the entire world while exporters are representative of trade flows and cover 96 percent of exports of unprocessed cotton, 88 percent of exports of semi-processed cotton goods, and 78 percent of processed cotton exports during the 2017–2021 period.

Table 4.5 Exporters and importers included in the regression

Exporters		Importers/Market	
All African countries	Italy	Central Africa	Bangladesh
Afghanistan	Malaysia	East Africa	Cambodia
Argentina	Mexico	North Africa	Pakistan
Australia	Netherlands	South Africa	Türkiye
Azerbaijan	Pakistan	Southern Africa	Uzbekistan
Bangladesh	Philippines	Eastern Europe	Viet Nam
Brazil	Poland	Italy	Rest of Asia Pacific
Cambodia	Portugal	Spain	Australia
China	Spain	Germany	Brazil
France	Tajikistan	Greece	Canada
Germany	Thailand	Rest of EU27	China
Greece	Türkiye	Switzerland	Hong Kong SAR, China
Hong Kong SAR, China	United States	UK	India
India	Uzbekistan	United States	Mexico
Indonesia	Viet Nam	Russia	Rest of LAC
		Thailand	XWD
		Iran	Rest of the world
		Japan	

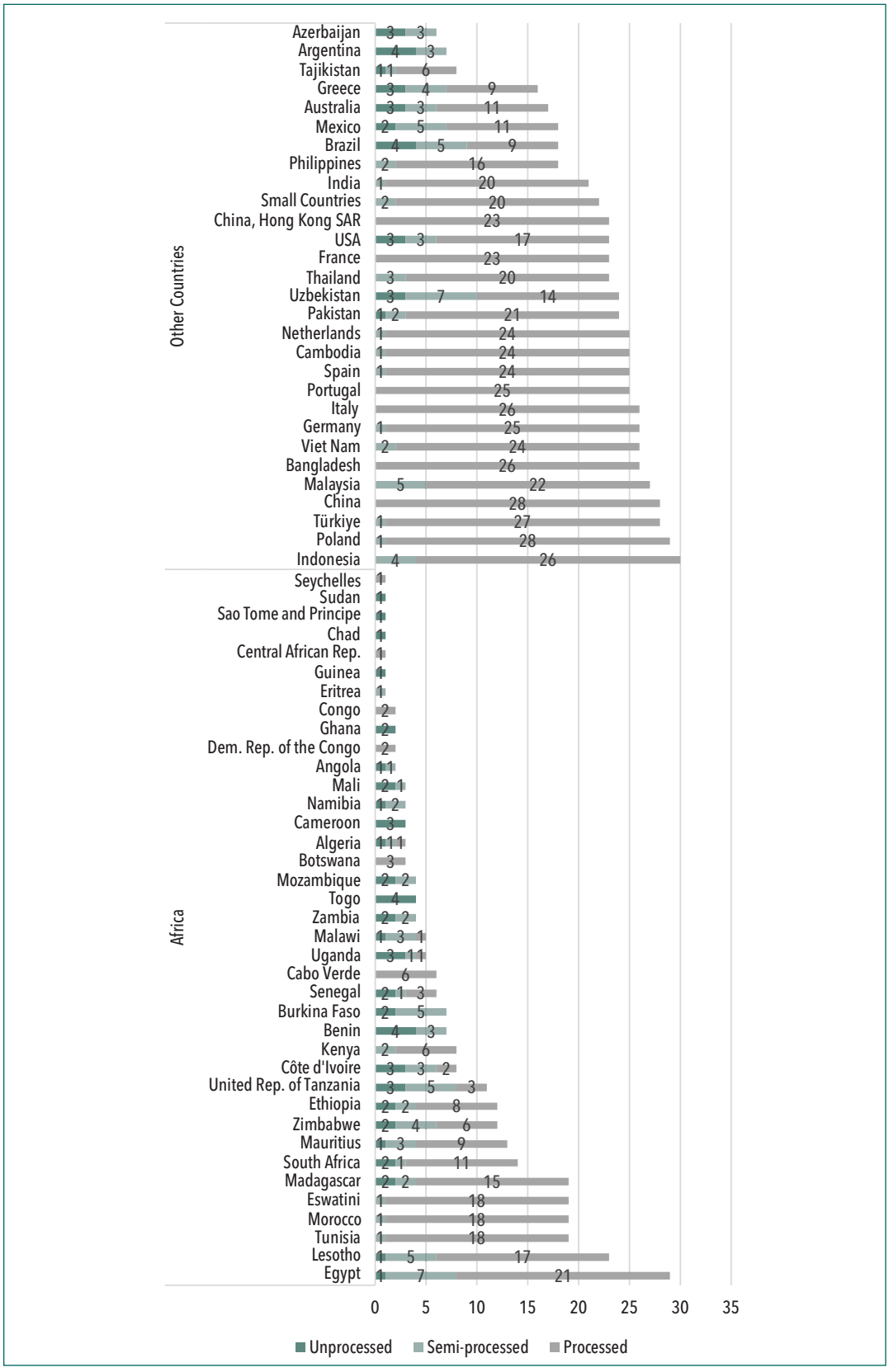
Source: Authors.
Note: XWD represents small countries not explicitly specified in the 2023 AATM database.
LAC = Latin America and the Caribbean; EU= European Union; UK = United Kingdom.

Figure 4.5 shows results for selected countries. African countries are competitive in just a few, mainly unprocessed, cotton products. Table 4.6 indicates the top 15 cotton products with an RCA for African countries, including mainly carded and combed cotton, cotton waste, and other fabrics and clothing. Egypt clearly has greater comparative advantage, especially in manufactured goods. Of interest in this figure is that countries with the highest number of RCAs are mainly manufacturing-oriented, especially Indonesia (30 products), Poland (29), Turkey (28), China (28), Malaysia (27), and other countries like Bangladesh, Viet Nam, Germany, and Italy, which are all competitive in more than 25 products.

It is important to note that by removing the size effect (captured by country pair fixed effect in equation 2), country-sector performances differ from performances based on the Balassa index. As highlighted by Leromain and Orefice (2014), the Balassa index[7] also depends on the share of country exports in world exports and therefore is influenced by the size of the country with a direct consequence on cross-country interpretation $(RCA_{ik} = \frac{x_{ik}/x_{i.}}{x_{wk}/x_{w.}} = \frac{x_{ik}/x_{wk}}{x_{i.}/x_{w.}})$. When the size bias is removed, Egypt, Lesotho, Madagascar, Tunisia, Côte d'Ivoire, and Eswatini show a higher level of competitiveness. In contrast, several countries, including Namibia, Ghana, Seychelles, Sierra Leone, Burundi, Rwanda, Gabon, Djibouti, Mauritania, and Nigeria, appear far less competitive when country-specific factors are controlled.

7 Balassa (1965) RCA is calculated by dividing the share of a product k in country's exports by the share of that product in total world cotton exports. It indicates a country's performance in trade of that product relative to other cotton products and other countries.

Figure 4.5 Number of RCAs, by level of processing for major cotton exporters 2017–2021



Source: Estimations using the 2023 AATM database.

Table 4.6 Top 15 new revealed comparative advantages (RCA) for African exporters

	Rank	Stage	Product	Number of countries
Africa	1	0	Cotton; not carded or combed	20
	2	0	Cotton waste (including yarn waste and garneted stock)	18
	3	1	Cotton yarn (other than sewing thread), containing 85% or more by weight of cotton, not put up for retail sale	15
	4	1	Cotton, carded or combed	14
	5	2	Suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches, and shorts (other than swimwear); men's or boys'	13
	6	2	Shirts: men's or boys', knitted or crocheted	10
	7	2	Shirts: men's or boys' (not knitted or crocheted)	10
	8	2	T-shirts, singlets, and other vests; knitted or crocheted	10
	9	2	Suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches, shorts (not swimwear); men's or boys', knitted or crocheted	8
	10	2	Suits, ensembles, jackets, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches, and shorts (not swimwear), women's or girls	8
	11	2	Suits, ensembles, jackets, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches, and shorts (other than swimwear); women's or girls	8
	12	2	Garments and clothing accessories; babies' (not knitted or crocheted)	8
	13	2	Underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns and similar articles; men's or boys', knitted or crocheted	8
	14	0	Vegetable products not elsewhere specified or included	8
	15	2	Blouses, shirts, and shirt-blouses; women's or girls' (not knitted or crocheted)	6

Table 4.6 Top 15 new revealed comparative advantages (RCA) for African exporters (continued)

	Rank	Stage	Product	Number of countries
Other countries	1	2	T-shirts, singlets, and other vests; knitted or crocheted	24
	2	2	Jerseys, pullovers, cardigans, waistcoats, and similar articles; knitted or crocheted	23
	3	2	Suits, ensembles, jackets, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches, and shorts (other than swimwear); women's or girls	21
	4	2	Track suits, swimwear, and other garments (not knitted or crocheted)	21
	5	2	Blouses, shirts, and shirt-blouses; women's or girls', knitted or crocheted	20
	6	2	Shirts: men's or boys', knitted or crocheted	20
	7	2	Shirts: men's or boys' (not knitted or crocheted)	20
	8	2	Garments; knitted or crocheted	20
	9	2	Blouses, shirts, and shirt-blouses; women's or girls' (not knitted or crocheted)	19
	10	2	Suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches, and shorts (other than swimwear); men's or boys	18
	11	2	Garments and clothing accessories, babies'; knitted or crocheted	17
	12	2	Coats; women's or girls' overcoats, carcoats, capes, cloaks, anoraks, ski-jackets, windcheaters, wind-jackets, and similar articles	17
	13	2	Hosiery; panty hose, tights, stockings, socks, and other hosiery, including graduated compression hosiery and footwear	17
	14	2	Suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches, shorts (not swimwear); men's or boys', knitted or crocheted	17
	15	2	Suits, ensembles, jackets, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches, and shorts (not swimwear), women's or girls	17

Source: Estimations using 2023 AATM database

Note: Stage 0 = Unprocessed; Stage 1 = Semi-processed; Stage 2 = Processed.

Challenges and Opportunities

Challenges

The African cotton exporting countries face many problems, which we summarize here in terms of tariffs and productive capacities.

Tariffs

Trade performances are greatly influenced by several factors including tariffs and nontariff measures (NTMs) that can limit regional and global trade. Tariffs, essentially taxes charged on the import of goods, can impact the economy and trade flows in many ways by raising prices for consumers, and so leading to a decline in imports. It can also influence local production and sales by making local goods cheaper compared to imported ones, thus supporting local production. In this section, we estimate the protection applied by African countries through tariffs and trade constraints for African countries created by other countries' tariffs.

Intra-African tariffs applied on cotton by level of processing

Figure 4.6 shows tariffs imposed by African countries on their African counterparts, based on the MAcMap HS6 2019 database (see Guimbard et al. 2012). A simple weighted average using MAcMap-HS6 Reference Group weights for aggregation is performed to approximate tariffs imposed and faced within Africa. It clearly shows higher tariffs in the downstream component of the value chain, that is, manufactured goods. East and Central African countries appear as the most protective countries by far, with tariff rates ranging from 27 percent in Cameroon, Chad, Gabon, and Equatorial Guinea to 33 percent in Ethiopia. Other countries such as South Africa and Mauritania apply a tariff rate of more than 19 percent to African countries.

For most countries, there is evidence of tariff escalation, meaning that tariffs are lower on primary products and then increase as the product undergoes additional processing. Only two countries, Mozambique and Zambia, impose higher tariffs on raw materials than on processed products. This situation, known as tariff abatement, can influence the country's competitiveness and is likely to be a barrier to imports of raw materials from other African countries and favor imports of processed goods.

Figure 4.7 shows tariffs imposed by African countries on regions outside Africa, which are higher for most of countries compared with tariffs within Africa. Exceptions include some Central African countries such as Cameroon, Central African Republic, and Republic of Congo, which apply preferential tariffs for imports of finished cotton goods from non-African countries. For raw products, Kenya, Mozambique, Rwanda, Uganda, and Tanzania also apply preferential tariffs outside the continent.

In sum, intra-African imports are more attractive in terms of tariffs, with regional average tariffs of 2.8 percent, 6.6 percent, and 14.0 percent respectively for unprocessed, semi-processed, and processed cotton. However, tariffs are still high within the region and are yet to be reduced. In addition, several initiatives have been put in place to generate additional revenue from cotton-related activities, and developed countries have committed to granting preferential trade arrangements, namely duty-free and quota-free market access, for exports of cotton and cotton-related agricultural products from least developed countries. The initiative of the World Trade Organization (WTO), International Trade Centre (ITC), and United Nations Conference on Trade and Development (UNCTAD) on cotton by-products requested by African producers could also support efforts to develop the cotton sector.

Figure 4.6 Tariff imposed by African countries on African countries, by level of processing, 2019

	Unprocessed	Semi-processed	Processed
Algeria	4.9	7.8	9.9
Benin	2.3	9.6	15.8
Burkina Faso	2.8	8.8	15.5
Cameroon	9.4	10.5	26.7
Central African Rep.	12.6	10.4	26.6
Chad	9.1	14.6	26.7
Congo	4.6	12.0	22.9
Côte d'Ivoire	2.0	2.3	15.5
Egypt	0.0	4.7	2.4
Equatorial Guinea	8.8	13.7	26.7
Eritrea	1.6	3.4	9.8
Ethiopia	6.2	13.5	32.6
Gabon	8.8	13.7	26.7
Ghana	1.7	2.2	14.8
Guinea-Bissau	2.2	8.3	15.5
Kenya	6.2	4.3	15.2
Libya	0.0	0.0	0.0
Madagascar	2.8	2.1	12.0
Malawi	6.4	3.4	7.2
Mali	2.2	8.4	15.6
Mauritania	5.0	6.4	19.1
Mauritius	0.0	0.0	0.0
Morocco	1.3	1.4	2.4
Mozambique	10.2	3.1	7.8
Niger	2.2	8.3	15.8
Nigeria	2.2	8.3	15.6
Rwanda	0.1	0.9	14.8
Senegal	1.7	2.2	14.2
Seychelles	0.0	0.0	0.0
South Africa	3.7	7.6	21.5
Togo	1.8	2.2	14.9
Tunisia	0.0	2.3	2.8
Uganda	0.1	0.9	13.8
Tanzania	6.2	11.6	12.5
Zambia	10.5	2.7	4.4
Zimbabwe	2.1	2.5	8.7
Africa	**2.8**	**6.6**	**14.9**

Source: Constructed from the MAcMap-HS6 database.

Figure 4.7 Tariff imposed by African countries on non-African countries, by level of processing, 2019

	Unprocessed	Semi-processed	Processed
Algeria	4.4	14.8	28.4
Benin	5.0	10.5	21.4
Burkina Faso	5.0	10.5	21.4
Cameroon	10.0	13.2	23.6
Central African Rep.	14.9	12.9	23.5
Chad	10.0	17.0	26.8
Congo	5.1	12.4	21.8
Côte d'Ivoire	5.0	9.9	20.4
Egypt	0.3	4.7	20.9
Equatorial Guinea	10.0	16.4	25.8
Eritrea	2.0	4.1	17.1
Ethiopia	9.1	18.9	34.7
Gabon	10.0	16.4	25.9
Ghana	5.0	9.9	20.4
Guinea-Bissau	5.0	10.5	21.4
Kenya	1.9	11.4	29.6
Libya	0.0	0.0	0.0
Madagascar	4.2	5.4	19.8
Malawi	5.1	12.7	24.9
Mali	5.0	10.5	21.4
Mauritania	5.0	12.8	19.0
Mauritius	0.0	0.3	0.7
Morocco	2.1	2.4	13.9
Mozambique	3.4	9.0	20.0
Niger	5.0	10.5	21.4
Nigeria	5.0	10.5	21.4
Rwanda	0.0	10.0	26.0
Senegal	5.0	9.9	20.4
Seychelles	0.0	0.0	0.6
South Africa	6.1	13.0	38.0
Togo	5.0	9.9	20.4
Tunisia	0.0	9.5	18.6
Uganda	0.0	9.1	25.7
Tanzania	1.9	13.1	27.3
Zambia	15.0	13.6	19.7
Zimbabwe	2.5	13.7	20.8
Africa	**3.5**	**8.5**	**24.3**

Source: Constructed from the MAcMap-HS6 database.

Comparison with other groups

African countries are imposing fewer tariff constraints on their African counterparts than the Asia-Pacific, Latin America and Caribbean (LAC), Eastern Europe, and BRICS (Brazil, Russia, India, China, South Africa) regions for all processing levels (Figure 4.8). The exception is the European Union, which imposes lower tariffs for Africa's unprocessed and semi-processed cotton. On the other hand, Africa is facing lower tariff barriers for its exports to other regions. Although tariff barriers are greater in BRICS (9.5 percent) and the Asia-Pacific (4.2 percent), and LAC (3.2 percent), these groups account for most of Africa's exports. In short, tariff escalation is observed in the cotton value chain. Tariff escalation is problematic in that it can limit exchanges for major exporters, who are likely to export raw fibers and import final goods related to textile and clothing.

Figure 4.8 Tariffs imposed and faced by Africa, by level of processing, 2019

	Tariff imposed by Africa			Tariff faced by Africa		
	Unprocessed	Semi-processed	Processed	Unprocessed	Semi-processed	Processed
Australia	3.4	8.4	22.7	0.0	3.4	4.6
Austria	4.2	8.2	21.8	0.0	0.1	0.0
Bangladesh	4.4	10.5	34.7	0.1	5.7	25.0
Brazil	3.6	5.7	22.5	6.0	14.6	31.6
China	4.5	10.0	25.1	10.8	2.5	6.2
Spain	2.4	2.6	12.2	0.0	0.1	0.0
Greece	0.8	5.5	6.5	0.0	0.1	0.0
Indonesia	3.9	8.1	25.8	0.0	6.6	19.5
Pakistan	3.9	8.0	21.6	3.1	5.0	19.5
Türkiye	4.2	7.2	16.0	0.0	0.1	0.2
Uzbekistan	3.7	9.9	32.6	19.3	18.9	56.5
Viet Nam	3.9	7.8	27.4	0.1	1.1	15.6
Africa	2.8	6.6	14.9	2.8	6.6	14.9
Asia Pacific	4.0	8.6	24.9	4.2	3.0	7.2
Eastern Europe	3.6	10.3	21.7	0.5	1.6	2.4
European Union	1.8	3.8	17.8	0.0	0.1	0.0
LAC	3.5	8.1	25.7	3.2	7.3	21.6
BRICS	3.7	10.1	25.0	9.5	3.8	9.9

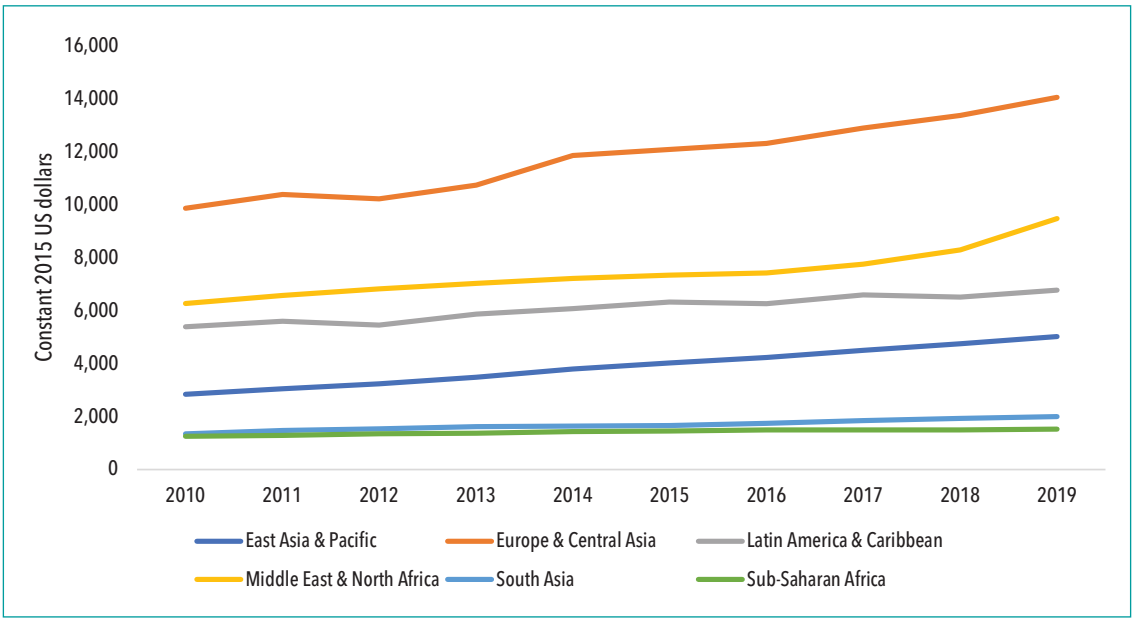
Source: Constructed from the MAcMap-HS6 database.
Note: BRICS = Brazil, Russia, India, China, and South Africa; LAC = Latin America and the Caribbean; EU= European Union.

Production capabilities

Increasing African production capabilities is essential to upgrade the region's cotton value chain. Cotton production faces several challenges, including low labor productivity, water stress (which is partially related to climate change), inadequate management practices, lack of technology, and dependence on imports.

First, as shown in Figure 4.9, productivity as measured by value added per worker in the agriculture sector is lower in Africa than in other emerging markets including South Asia, Latin America, and East Asia and the Pacific. Clearly, low labor productivity explains why African exports are largely confined to products with limited value addition. More productive (and skilled) labor is needed for downstream stages in the cotton value chain. It is important to note that North America is not included in the figure, given its significantly higher level of labor productivity. Such a large difference in the productivity level between developed and emerging economies can be attributed (among other reasons) to the significant subsidies that are provided to the agriculture sector.

Figure 4.9 Agriculture, forestry, and fishing value added per worker, by region

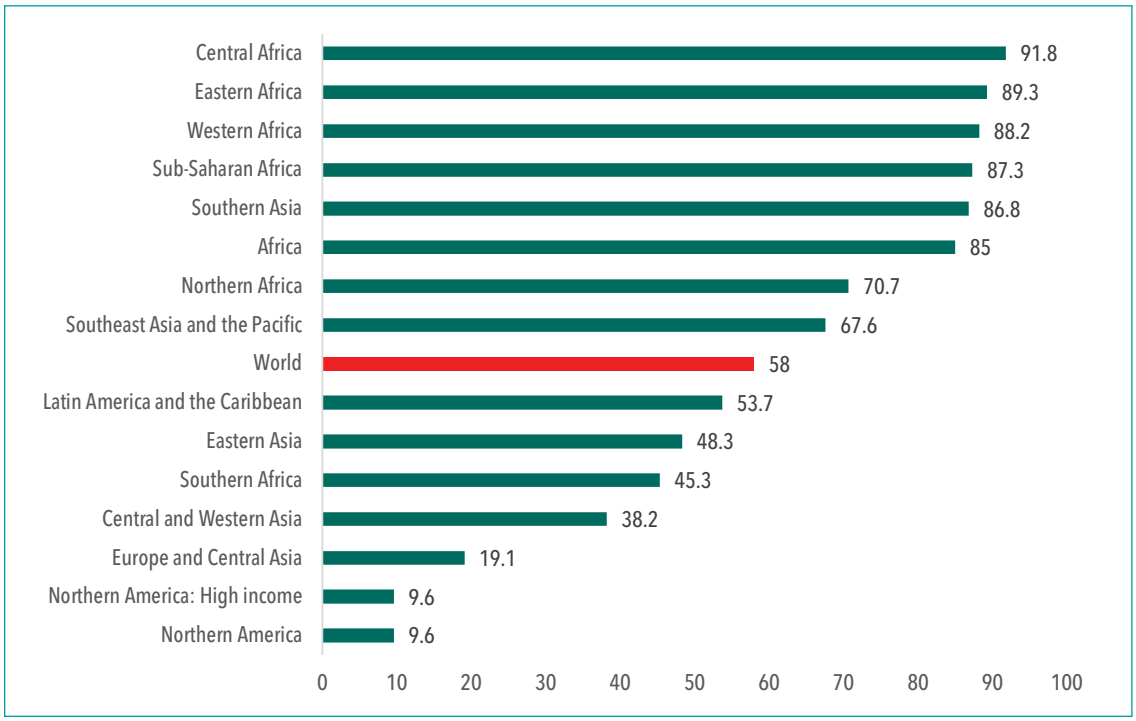


Source: World Bank World Development Indicators.

Note: North America has been removed from the graph for ease of reading.

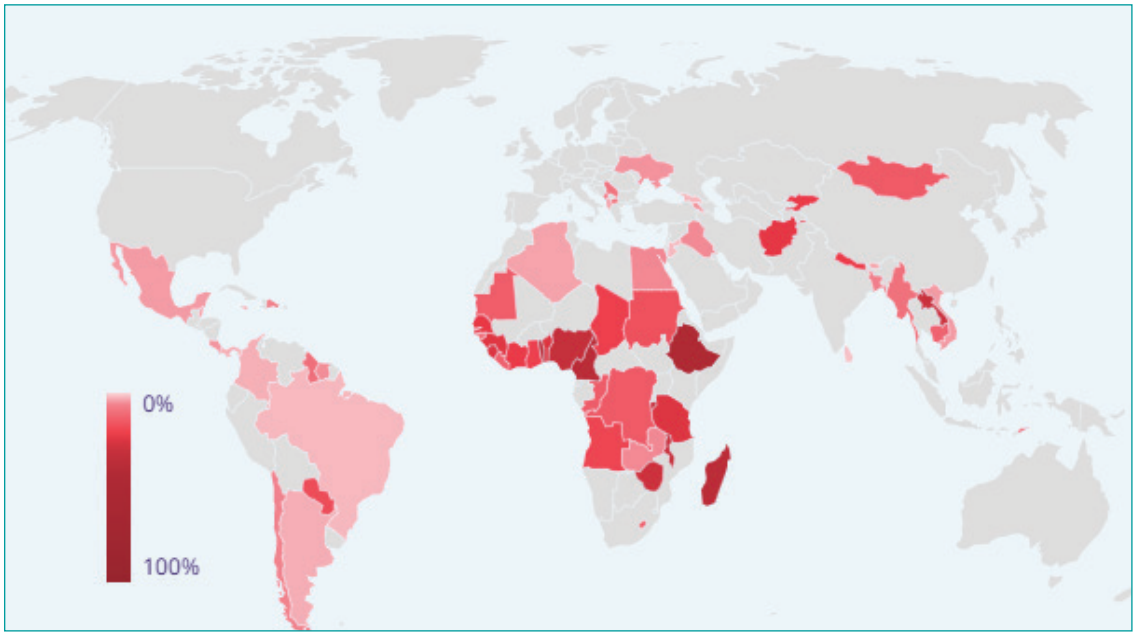
There are multiple reasons why labor in Africa remains unskilled and labor productivity remains low, leading to low wages and high levels of informal employment and child labor. First, informality can lead to the misallocation of capital and labor toward less productive firms, which lowers aggregate productivity (Hsieh and Klenow 2009; Alvarez and Ruane 2019). In addition, informal workers are generally less skilled than formal ones. Figure 4.10 presents data from the International Labour Organization that show most African regions have significantly high shares of informal employment, which negatively affects labor productivity needed for value chain upgrading. Second, agriculture is characterized by a high level of child labor. While child labor still exists in the world's top-producing countries (China, India, Pakistan, and Brazil), it is most common in Africa (Figure 4.11). Apart from being less skilled and less productive, child labor can also affect competitiveness as some countries impose restrictions on imports coming from countries that allow child labor. Formalizing labor and prohibiting child labor are necessary to upgrade the value chain.

Figure 4.10 Informal employment rate (%), 2022



Source: ILO modeled estimates Nov. 2022.

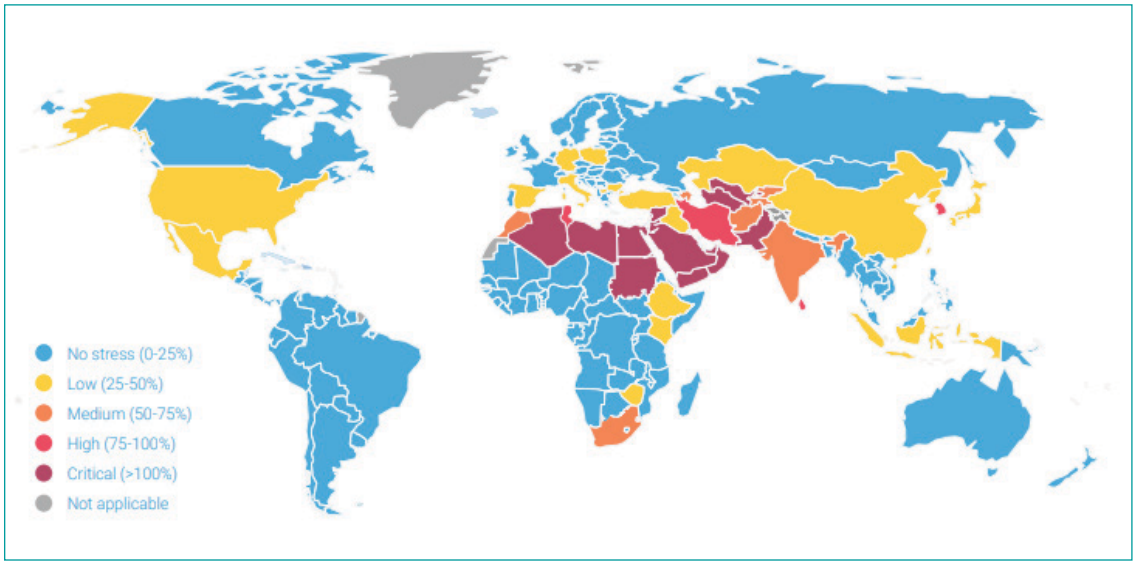
Figure 4.11 Prevalence of child labor by country, 2021



Source: ILO Stat (2021).
Note: The darker the red the higher the share of children in economic activity and household chores. Gray indicates areas where there is no data. Estimates on economic activity and household chores among children aged 5–17 refer to: (a) children 5–11 years old who, during the reference week, did at least one hour of economic activity or at least 21 hours of household chores, (b) children 12–14 years old who, during the reference week, did at least 14 hours of economic activity or at least 21 hours of household chores, (c) children 15–17 years old who, during the reference week, did at least 43 hours of economic activity.

Second, among the main challenges facing African countries in the agriculture sector, and especially in cotton, are water stress and water management practices. Figure 4.12 shows that North African countries (Egypt, Sudan, Tunisia, Algeria, and Libya) face the most severe water problems. To evaluate water management practices, it is important to look at the water footprint of particular products. This measures the amount of water that is consumed and polluted in all processing stages. The water footprint of seed cotton is large, with global average water use of 3,644 cubic meters per ton, much more than sugar (197) or vegetables (322) (Mekonnen and Hoekstra 2010). Hence, the combination of water scarcity and poor management practices is likely to erode the competitiveness of African countries in water-intensive products such as cotton. In the same vein, Figure 4.13 shows that both North African and sub-Saharan African countries have a relatively high rate of freshwater withdrawal for agriculture, compared with other emerging economies. As a result of water scarcity and poor management, 50 percent of all global cotton-growing regions will face increased risk of drought.[8] Indeed, severe droughts in many African countries and irregular rainfall have already been damaging for cotton farmers. This problem is obviously amplified by climate change challenges and is likely to increase in the future because of higher temperatures, drought, and changing rainfall patterns, which can affect the agriculture sector, ecosystems, and biodiversity. According to the World Meteorological Organization (2022), the average rate of warming was +0.3°C/decade between 1991 and 2021 in Africa, which is faster than +0.2°C/decade during the 1961–1990 period.

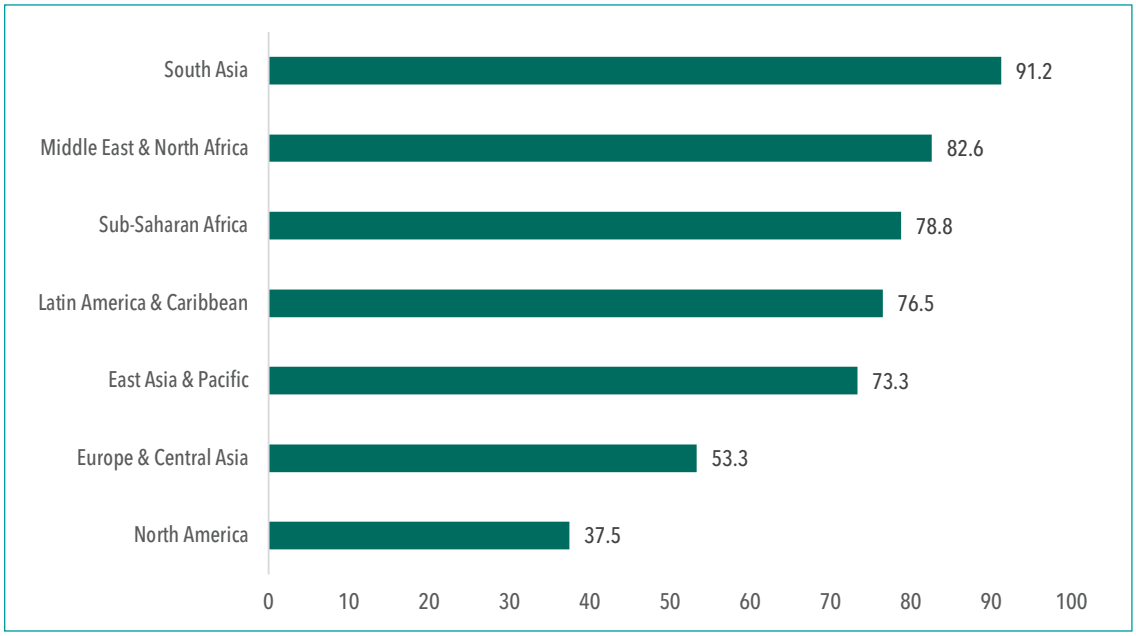
Figure 4.12 Global map of the level of water stress, 2018



Source: UN Water (2021).

8 https://www.innovationintextiles.com/cotton-growing-regions-face-severe-climate-risks/

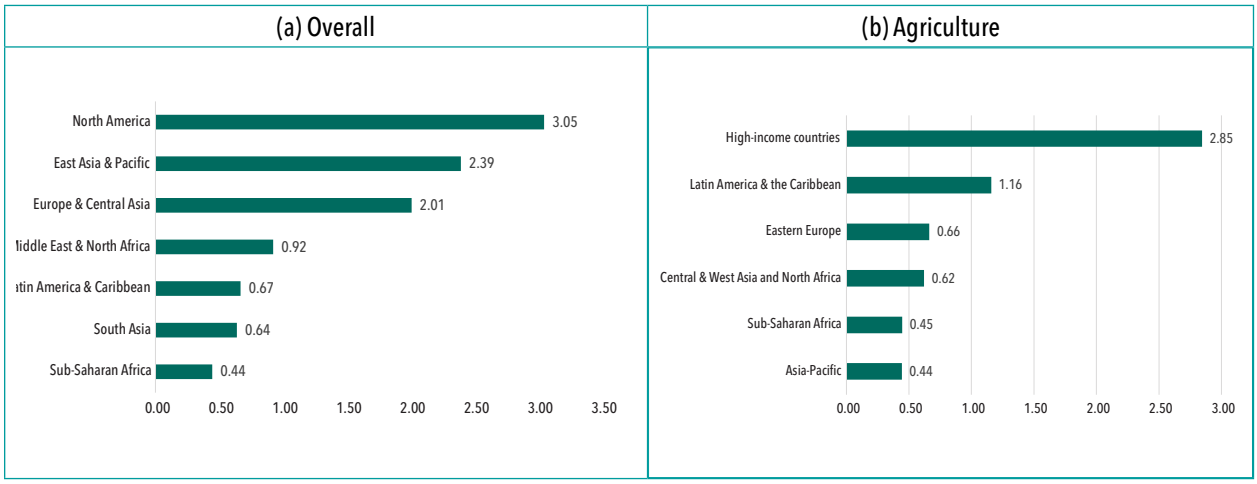
Figure 4.13 Annual freshwater withdrawals for agriculture (% of total freshwater withdrawal)



Source: World Bank World Development Indicators.

Third, lack of technology helps explain why African countries generally remain at the upstream end of the value chain in cotton and why labor productivity remains low. R&D efforts to generate appropriate technologies are essential to improve the quality of products, innovate, develop new products, and scale up the value chain (Shawn et al. 1994). Figure 4.14 shows that sub-Saharan Africa has the lowest level of R&D expenditure as a share of GDP at 0.44 percent, while South Asia's is 0.64 percent and East Asia and the Pacific's reaches 2.39 percent. The Malabo Declaration established a target of reaching 10 percent public expenditure on agriculture as a share of total public expenditure. The Third Biennial Review found that, while member states have allocated public spending to agriculture at various rates between 0.1 and 10 percent, only four (Burundi, the Democratic Republic of the Congo, Ethiopia, and Mali) have reached the target. Given the modest level of R&D spending, the resulting lack of technology, which is coupled with a lack of modern production machinery and qualified personnel, can potentially be overcome by increasing foreign direct investment allocated to the agriculture sector to improve technology transfer (Slimane et al. 2016). Yet this will require better institutions, given that the legal framework and procedures governing land acquisition, land registration, land-use, and the rights of smallholders are generally unclear and untransparent and market information is lacking (Gerlach and Liu 2010).

Figure 4.14 Research and development expenditure (% of GDP)



Source: World Bank World Development Indicators.

Source: Nin-Pratt (2021).
Note: Data are for 2013 (latest available).

From a policy perspective, African countries face different types of problems for expanding trade as input (forward linkages) or output (final products) providers. For inputs (raw and semi-processed cotton), the timeliness of exports is essential to guarantee the arrival of products on time for processors and manufacturers. Thus, improving customs and reducing administrative barriers to trade through trade facilitation will be indispensable. Moreover, developing such value chains in Africa should be perceived as a strategic investment in order to diversify production location and near-shoring[9] closer to major markets to reduce risks linked to value chain disruptions. Regarding outputs, as mentioned already, many African countries do not have the relevant R&D institutions nor marketing strategies that focus on the agriculture sector that are needed to upgrade the cotton value chain.

Increasing yields and quality in the context of smallholder farming

Cotton is largely cultivated by smallholder farmers in Africa, with a very small number of large plantations. For smallholder cotton farmers, this cash crop is often their main activity, grown along with staples for household subsistence. Grains that are cultivated in rotation after cotton benefit from the after-effect of fertilizers used for cotton. Cotton is largely rainfed in Africa, with negligible areas of irrigated production, mostly in Egypt and Morocco, meaning Africa's seed cotton harvest is highly vulnerable to weather conditions (OECD/SWAC 2009). In addition, smallholders often lack access to extension services and credit for buying inputs such as seeds, fertilizers, pesticides, equipment, labor, animal traction, and machines. Addressing this difficulty is crucial to raise productivity, preserve Africa's reputation for its cotton lint quality, and increase farmers' income and retain them in the sector (Staritz and Troster 2015). The review of African cotton development at the beginning of this chapter shows that the regulated systems of cotton sector organization (concession monopoly and concentrated competition models) were more effective than the competitively structured model with respect to sustaining yields and quality through technical support and input credit schemes for cotton farmers. However, this effectiveness depends on government capacity to monitor cotton companies and farmer organizations (Poulton et al. 2004).

9 Near-shoring is the inverse of offshoring. It refers to the case where companies transfer part of their production to countries that are geographically closer to their markets and with similar time zones to reduce supply chain disruptions.

Dealing with volatile international prices

The volatility of world cotton prices has always been a major concern for all stakeholders in the cotton sector, including governments, companies, farmer organizations, international cotton traders, and financial institutions. The scale of cotton price changes has increased over the past two decades. Table 4.7 shows that volatility has been higher in cotton prices than in the prices of tobacco, tea, and soybean and groundnut oil over the 2003–2022 period. However, cotton prices have been notably less volatile than sugar, coconut oil, barley, and maize prices.

Table 4.7 World price volatility for 18 selected agricultural commodities (percent)

	1963–1982	1983–2002	2003–2022
Cotton, A Index	14.3	17.9	20.9
Sugar	68.7	22.9	25.6
Tobacco	14.8	11.8	11.4
Cocoa	37.4	31.1	18.3
Coffee, Arabica	32.4	32.0	22.4
Coffee, Robusta	37.6	36.1	18.4
Tea, Mombasa	14.8	29.7	16.4
Coconut oil	27.9	41.4	25.5
Groundnuts	11.0	14.7	19.3
Groundnut oil	23.6	23.1	16.6
Palm oil	21.2	34.8	21.7
Soybeans	20.2	13.3	16.1
Soybean oil	27.2	26.9	22.2
Barley	14.6	17.9	24.4
Maize	15.7	20.7	23.5
Sorghum	15.0	18.9	20.0
Rice, Thai 5%	31.4	13.8	21.4
Wheat, US hard red winter	21.5	16.3	22.3

Source: Authors' calculations based on World Bank Commodity Price Data (1963–2022).
Note: Price volatility index is calculated as a trend-corrected coefficient of variation in the series of annual prices of individual commodities over the specified periods.

Dealing with price volatility is important for sustaining cotton production and retaining smallholders in the sector. African governments generally rely on price stabilization funds. In principle, funds are accumulated when prices are high and then used to cover deficits when prices are low. In practice, however, the stabilization funds available are often insufficient when they are needed most, especially during a long period of low prices (Tschirley et al. 2009). Consequently, deficits must be covered by public revenues, with the risk of creating severe financial difficulties as occurred in the past. Hedging is an alternative strategy to manage the risk associated with global price volatility. However, this requires access to information, financial resources, and brokerage services that are beyond the management capacity of farmer organizations while being too costly, risky, and complex for cotton companies (Dana and Dadler 2012). In addition to unstable international cotton prices, African cotton competitiveness is challenged by the subsidies granted by the largest cotton trade players in the world, namely the United States, European Union, and China. Four West African countries—Benin, Burkina Faso, Chad, and Mali, known as Cotton 4—raised this issue during the 2003 WTO negotiations,

calling for the elimination of these subsidies and some compensation to cover the losses they face. Over the years, the WTO has addressed the subsidy issue along both dimensions. First, trade aspects are discussed in the multilateral negotiations to address distorting subsidies and trade barriers for cotton. Second, discussions are held bi-annually on development assistance to cotton-producing developing countries.[10] Furthermore, francophone West African countries must also face the drawbacks of having their local currency, the CFA franc, pegged to the Euro. This is likely to drive an overvaluation of the CFA franc and an associated loss of competitiveness. More importantly, the fluctuations in the Euro/US dollar exchange rate create additional uncertainty for West African cotton exports.

Increasing value addition through local processing of cotton lint

A large share of cotton lint produced across Africa is not processed locally. Table 4.8 shows that up to 60 percent of lint production is exported, of which only 4.5 percent is destined to intra-African markets. At the same time, individual African countries mostly import final products made of cotton—textiles, apparel, and second-hand clothing—from Asia and Europe. This suggests opportunities to generate employment, improve the trade balance, and reduce vulnerability to external shocks and policy changes by increasing the processing of cotton lint and seed. Boosting local consumption is a good approach to promoting cotton processing. The African Continental Free Trade Area (AfCFTA), which entered into force in January 2021, offers unprecedented opportunities to develop regional value chains by exploiting regional complementarities and integrating domestic markets, resources, and manufacturing bases across Africa (AUC/OECD 2022). In a recent study of 94 value chains linking at least five African

10 https://www.wto.org/english/tratop_e/agric_e/cotton_e.htm

countries from different regions, cotton clothing is ranked among the most promising for regional value chain development (ITC 2022). However, major infrastructure challenges must be addressed to enable the expansion of cotton processing capacity in Africa. In particular, in the power sector, energy is costly and unreliable due to persistent electricity scarcity and poor infrastructure for power generation.

Table 4.8 Average volume of Africa's production and export of cotton products, 2017–2021

Item	Production (metric tons)	Total exports		Intra-African exports
		(metric tons)	(share of production)	(share of production)
Seed cotton, unginned	5,074,665			
Cotton lint, ginned	1,847,480	1,122,976	60.1%	4.5%
Cotton seed	2,871,530	331,736	11.4%	10.0%
Cotton linters		19,474		
Cotton, carded or combed		232,941		
Cottonseed oil	272,829	32,648	13.2%	11.0%
Cotton waste		22,294		
Cake of cottonseed		285,207		

Source: Authors' calculations based on FAO statistical database (FAOSTAT).

Opportunities

Export potential

To see how African countries can seize new opportunities and increase their exports, it is important to know who are their competitors. According to ITC (2022), suppliers with the greatest potential to export cotton (fabric) are China (with the largest potential, $5.8 billion), India, and Viet Nam. The other competing countries are primarily Asian (Pakistan, Türkiye, Uzbekistan, and Republic of Korea) and European (Spain, France, and Portugal, noting that Italy and Germany export more than their potential).

Africa has the potential to export $6.2 billion of cotton garments by 2026, with 15 percent of these exports on the African continent (ITC 2022). Yet, it is important to identify how this potential is allocated along the cotton value chain. To do so, ITC (2022) has developed a methodology with several steps. First, it categorizes different products at the HS6 level as outputs if they are processed and non-intermediate goods, and as inputs in other cases. Then, it uses sector-level input-output tables from the United States, Mexico, and the Philippines to identify input-output linkages. Third, the comparative advantages in inputs and outputs of potential value chains are assessed. Countries identified as potential participants are those with an RCA or an export potential (using a gravity-type model) of at least $10 million in the output and/or in at least one input of the value chain.

Table 4.9 presents the export potential along the cotton value chain for exporting countries that have an RCA. Combining the two indicators is important as a country can make more use of its potential if it has an existing comparative advantage. Three points are worth noting. First, most of the African countries (17) have a higher potential at lower levels (upstream) of the value chain (such as cotton that is neither carded nor combed) or slightly processed (5 for carded and combed cotton and 7 for cotton yarn). Second, at higher levels of the value chain (downstream), fewer countries have a comparative advantage in denim and apparel of cotton (5 countries in both, 1 in denim only, and 5 in apparel of cotton only). Third, substantial heterogeneity is observed across different countries, as several countries do have potential and comparative advantage in several stages (such as Egypt, Lesotho, and Mauritius) and thus are providers of inputs and outputs (see Table 4.10). Other countries are confined to inputs (such as Benin, Burkina Faso, and Cameroon) and others to outputs only (Kenya and Cabo Verde).

Table 4.9 Countries with export potential of more than US$10 million and RCA

Fiber	Cotton, not carded/combed	Benin, Burkina Faso, Cameroon, Central African Rep., Chad, Côte d'Ivoire, Egypt, Malawi, Mali, Mozambique, Senegal, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe
	Cotton, carded/combed	Egypt, Lesotho, South Africa, Tanzania, Uganda
Yarn	Single and folded/cabled cotton yarn	Egypt, Ethiopia, Lesotho, Mauritius, Mozambique, Tanzania, Zimbabwe
	Sewing thread of cotton	Egypt, South Africa, Uganda
Fabric	Knit/crochet cotton fabrics	Eswatini, Mauritius, Tanzania
	Woven fabrics of cotton	Côte d'Ivoire, Egypt, Mauritius
Garments	Apparel of cotton	Cabo Verde, Egypt, Eswatini, Ethiopia, Kenya, Lesotho, Madagascar, Mauritius, Morocco, Tanzania, Tunisia
	Denim with cotton	Egypt, Ethiopia, Lesotho, Mauritius, Morocco, Tunisia
Other	Slide fasteners	Eswatini
	Buttons of plastics or base metal	Madagascar, Mauritius
	Auxiliary machinery for use with machines	Tunisia

Source: Author's elaboration based on ITC (2022).

Morris and Fessehaie (2014) argue that forward-backward linkages can play a significant role in the industrialization of African countries. Yet, it is impossible to consider forward linkages without taking backward linkages into account, since expanding the supply side of resources will help African countries provide new products and become part of global value chains. These linkages explain how large domestic or regional markets can help African exporters develop their final products, as final products can be exported to other African countries (World Bank 2020; Bouët et al. 2021), whereas intermediate products are exported to advanced economies. At later stages of value chain development, African countries can export final products to Northern markets thanks to greater economies of scale, better quality, and thus a greater market access. This is why the AfCFTA can be beneficial to African countries—it should help them increase their intraregional exports. For instance, UNECA (2021) shows that intra-African trade can increase by between 15 and 25 percent (or $50 billion to $70 billion) by 2040, depending on the level of liberalization within the AfCFTA, compared to a situation with no AfCFTA.

Along the cotton value chain, there are also some opportunities for artisanal products. For example, soap could be produced from cotton processing waste; crushing cottonseed for edible oil can produce the black or white cake that is used to produce soap (WEF 2021). With more robust and sounder marketing and packaging strategies, this soap, which is now chiefly consumed on the domestic market, could be exported.

Table 4.10 Potential input and output providers along the value chain

Input	Output	Input and Output
Benin	Cabo Verde	Egypt
Burkina Faso	Kenya	Eswatini
Cameroon		Ethiopia
Central Rep Africa		Lesotho
Chad		Madagascar
Côte d'Ivoire		Mauritius
Ghana		Morocco
Malawi		South Africa
Mali		Tanzania
Mozambique		Tunisia
Senegal		Uganda
Sudan		Zimbabwe
Togo		
Zambia		

Source: Author's elaboration based on ITC (2022).
Note: The classification into potential input, output, or both is based on ITC (2022) that calculates the export potential using input-output tables. This classification also depends on the comparative advantages in inputs and outputs of potential value chains.

In terms of new products, in West Africa, there are some initiatives to increase the production of organic cotton (being safer and more profitable) and to enhance biological forms of pest control and soil fertilization. Such an initiative will help boost the demand for West African cotton. For non-clothing use, however, demand for artificial fibers that are petroleum-based and chemically treated (polyester, nylon, acrylics, polyolefin, etc.) is increasing. Indeed, in 2021, based on the Observatory of Economic Complexity dataset,[11] the world's most traded artificial fiber wastes were waste of synthetic fibers ($234 million) and waste of artificial fibers ($8.29 million), mainly concentrated in the United States, Belgium, United Kingdom, and some Asian countries (Japan, China, Indonesia, Viet Nam). The only African countries that export this product are South Africa, Egypt, and Ethiopia. However, from a sustainable development perspective, the demand for artificial fibers might decrease because of their environmental implications and the depletion of oil.

Domestic and regional policies

While some African countries have implemented a few domestic policies to improve the cotton value chain, regional policies have been more extensive. Yet, it is important to note that national development policies are not always aligned with regional initiatives. To cite a few examples, Benin, which is becoming a leading exporter of cotton in Africa, is making significant effort to improve the cotton value chain. Letondji Beheton, managing director of the Glo-Djigbe Industrial Zone (GDIZ), 45 kilometers from Cotonou, has reportedly said, "*We have decided*

11 https://oec.world/en/profile/hs/artificial-fibers-waste

that in this country, we are no longer going to sell this cotton raw. We are going to transform this cotton, in particular, by installing integrated textile factories."[12] In South Africa, in order to develop the cotton value chain and to increase trade and investment opportunities with the European Union, the two partners established the EU–SA Natural Fibers Industry Platform[13] to facilitate discussions between business associations, growers, manufacturers, potential investors, and equipment suppliers and buyers. In Ethiopia, the government has developed a National Cotton Development Strategy (NCDS) for 2017–2032 that seeks to enhance value creation in the domestic value chain (Hilbert et al. 2018).

At the regional level, several initiatives have been implemented. They can be divided into two types: those related to trade and those related to cotton sustainability.

Regarding trade, first, the AfCFTA now in effect since January 1, 2021, is an important opportunity not to be missed. The AfCFTA provides a great testing ground for African final products before they can be exported to more demanding destinations such as the European Union. In addition, the African Development Bank estimates that up to 600 percent in value addition can be created along the cotton value chain that ranges from cotton production to spinning yarn to weaving and knitting into fabric, then to dying, printing, and designing. However, there is still no agreement regarding rules of origin (RoO) in the textile and apparel industry, in part because relaxed RoO on existing industries in Africa could be undermined by cheaper imported intermediate products from third countries (Agarwal et al. 2023). Thus, for the AfCFTA negotiations, there is a need to balance between RoO that stimulate the use of intraregional intermediate inputs over non-African ones in order to build regional value chains, and RoO that impose excessive costs on exporters and thus do not stimulate regional trade (Signé and Madden 2021). Second, the African Cotton & Textile Industries Federation (ACTIF) was created in 2005 to promote trade and increase market access for the cotton, textile, and apparel industry in Africa. Its four main activities are advocacy, enhancing competitiveness, trade linkages, and information service. It also organizes several events (trade expo, investment forum, business-to-business activities, seminar series, and designer showcase). Third, the ITC initiative (2013), under the framework of the All African, Caribbean and Pacific States Agricultural Commodities Program (AAACP) financed by the European Commission, assisted several regional economic communities (COMESA, WAEMU, and ECCAS) to develop cotton-textile regional strategies (ITC 2013) and supported by the European Commission through the 10th European Development Fund. This initiative also aimed at increasing South–South cooperation by facilitating learning and collaboration, especially with Asian countries that have built cotton and textile value chains.

Regarding cotton sustainability, the Better Cotton Initiative (BCI) was established in 2009 to ensure the sustainability of the cotton supply chain in several developing economies by (1) helping cotton communities survive and (2) protecting the environment. Thanks to this initiative, 2.4 million cotton farmers have been trained in sustainable farming practices and are licensed to grow Better Cotton. In Africa, Better Cotton operates directly in Egypt, Madagascar, Mali, Mozambique, and South Africa. In addition, it operates through another initiative (Aid by Trade Foundation) in Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Mozambique, Nigeria, Tanzania, Uganda, and Zambia. Another initiative, Cotton Made in Africa (CmiA) established by the Aid by Trade Foundation, aims to use trade to help people improve the working conditions of smallholder farmers in Africa in a sustainable way throughout the cotton value chain. It also supports the implementation of standard and proper processing for certified raw materials.

12 https://www.reuters.com/markets/commodities/cotton-exporter-benin-developing-home-grown-textile-industry-2022-10-24/
13 https://www.euchamber.co.za/news/opportunities-south-african-cotton-and-wool-sectors/

Thanks to this initiative, and according to CmiA, 40 percent of African cotton production is CmiA verified, around 900,000 smallholders are benefiting, and they produce cotton with about 13 percent less greenhouse gas emissions than the global average. This was also recognized by different institutions such as Green Button (a German certification program) and LLP (a Polish clothing company), along with 66 trading partners; this recognition is likely to increase the demand for African cotton. Third, the African Cotton Foundation (ACF) was established in 2018 in the same spirit as these other initiatives to support African farmers in improving livelihoods and sustainability. ACF aims to mobilize efforts of development agencies, the private sector, and governments in order to strengthen the entire cotton value chain. While ACF is not a certification body, its activities are in line with most of the certification systems. It operates in nine countries (Chad, Côte d'Ivoire, Nigeria, Zambia, Tanzania, Uganda, Malawi, Mozambique, and Zimbabwe) with around 700,000 smallholder farmers. Finally, the Fairtrade fiber crop (cotton) and textile standard was an initiative managed by TransFair (a German membership organization of Fairtrade International) and refers to a standard for cotton and textiles that guarantees that products are environment-friendly and produced in decent working conditions (Hilbert et al. 2018). This guarantees better market access for African cotton.

Despite different initiatives developed by Africans or supported by external actors, all the structural challenges that have been discussed above continue to constrain the potential of Africa in cotton, namely, the lack of infrastructure, lack of technology, low productivity of labor, and water stress and climate change. To leverage export potential, structural reforms are needed to increase labor productivity (formalizing informal employment and banning child labor), invest in R&D and channel more public spending to the agriculture sector, improve infrastructure, trading under the AfCFTA to further liberalize trade, and address NTMs (especially RoO). In addition, these initiatives need to be better financed and monitored to guarantee their sustainability. It is also important to involve farmer associations to develop policies and measures in a bottom-up fashion, rather than through the top-down approach that is currently used.

Conclusion

This chapter has examined the performance of African countries in the cotton value chain, starting with a review of the evolution of the cotton sectors in Africa since the colonial period, followed by an overview of recent patterns of Africa's participation in world cotton trade, then a discussion of the challenges facing cotton development and opportunities to be seized for cotton trade expansion in Africa.

The historical background shed light on differences between WCA and ESA countries with respect to how sector coordination and competition affected sector performance over time. Cost inefficiencies and political interference in the management of government-controlled cotton companies in the early decades of independence led to severe financial difficulties and sector liberalization reforms in the 1990s. In Benin, Burkina Faso, Mali, Mozambique, and Zimbabwe, reforms resulted in limited competition between government-controlled cotton companies and a few private cotton ginners that entered the sector. In addition, farmer organizations were promoted and involved in the management of the sector to sustain input credit schemes and extension services. This enabled the expansion of seed cotton production and the preservation of cotton lint quality. In contrast, in ESA, liberalization reforms in the sector led to a more competitive market structure, in particular in Uganda and Tanzania, with the entry of several seed cotton buyers and ginners. However, farmer associations were not involved, and input credit and technical support for smallholder farmers failed, seed cotton production fell, and lint quality declined. While further structural reforms are important in the national

cotton sectors, institutional changes and government interventions also appear important to support and sustain the smallholder basis of cotton production in Africa.

Compared to a decade ago, Africa's global exports of cotton products have decreased by 12 percent, while global imports have increased by 37 percent. The continent's cotton trade balance has deteriorated, on average, from a surplus of $6.7 billion in the 2006–2010 period to a deficit of $2.9 billion in the 2017–2021 period. Compared to other world regions, Africa's participation in world cotton trade is still relatively limited. The continent has produced 12 percent of the world exports of unprocessed cotton in recent years. The corresponding shares for the semi-processed and highly processed cotton products are 2 and 3 percent, respectively. On the imports side, Africa accounts for 3 to 5 percent of world imports of cotton products across the three processing levels.

Africa's cotton exports are highly concentrated in few countries. Five West African countries—Benin, Burkina Faso, Côte d'Ivoire, Mali, and Togo—contribute two-thirds (65 percent) of the continent's unprocessed exports. The same proportion of semi-processed exports is shipped from Egypt, Benin, Mali, and Tanzania, with Egypt alone contributing 41 percent. Three North African countries—Morocco, Tunisia, and Egypt—produce 73 percent of Africa's global exports of highly processed cotton, each contributing more than 20 percent.

Benin, Burkina Faso, and Côte d'Ivoire are the three leading African exporters of unprocessed products. These countries are among the top 10 world exporters of raw cotton, competing with the United States, Brazil, India, Australia, Greece, Türkiye, and Uzbekistan. Egypt, Benin, and Mali are the three major African exporters of semi-processed cotton products, while Morocco, Tunisia, and Egypt lead the continent's exports of highly processed exports. However, these top African countries are not among the leading world exporters of semi-processed or highly processed products.

Africa's cotton exports are largely to extra-continental markets. Asian countries are the major destinations for Africa's unprocessed cotton, led by Bangladesh, China, and India. Egypt is also among the top 10 destinations. The continent's semi-processed cotton exports are primarily destined to Italy and Türkiye, with South Africa and Nigeria among the top 10 destinations. The United States and EU countries are the main clients for Africa's highly processed cotton exports, with South Africa also among the top 10 destinations.

Intra-African destinations account for 30 percent of Africa's global exports of semi-processed cotton; the corresponding shares for unprocessed and highly processed cotton are 9 and 10 percent, respectively. Major intra-African export destinations—accounting for at least 50 percent of the intra-continental exports—are Egypt and Mauritius for unprocessed exports; South Africa, Nigeria, and Eswatini for semi-processed exports; and South Africa for highly processed exports.

Africa largely imports cotton products from extra-continental markets. These imports are dominated by highly processed products, which mostly originate from China, India, and Türkiye, but also from Mauritius and South Africa, which are all ranked among the 10 leading world sources of Africa's imports of highly processed products. The continent's imports of semi-processed products also originate primarily from India, Türkiye, and China, with Mauritius and Benin also among the top 10 sources. Surprisingly, the major sources of African countries' imports of unprocessed cotton are also outside the continent. Greece and the United States come first, together shipping 38 percent of Africa's imports, followed by intra-African suppliers, but also by Spain, all among the top 10 sources of Africa's global imports. North African

countries—the major exporters of African processed cotton—are the main African importers of unprocessed cotton from outside the continent. Further research is needed to understand whether this outsourcing of raw cotton is due to differentiation in cotton quality or to logistics. Intra-African suppliers provide 47 percent of Africa's global imports of unprocessed cotton compared to only 16 percent of semi-processed and 10 percent of highly processed cotton. Leading intra-African cotton import sources—accounting for at least 50 percent of intracontinental imports—are Sudan, Benin, and Zambia for unprocessed imports; Mauritius, Benin, Lesotho, and South Africa for semi-processed imports; and Mauritius, South Africa, and Eswatini for highly processed imports.

The results of our RCA analysis suggest that African countries are primarily competitive in unprocessed products, including mainly cotton seeds, cottonseed oil, carded or combed cotton, cotton linters, cotton sewing thread, and other fabrics and clothing. Only Egypt reveals some comparative advantage in manufactured cotton products. In fact, African cotton-producing countries face difficulties in increasing yields and improving quality, managing highly volatile world prices of cotton, and increasing local processing of cotton lint and seed. While these difficulties affect their competitiveness in world markets, tariff protection limits their competitiveness in intra-African markets. East and Central African countries appear as the most protective countries by far, with tariff rates ranging from 27 percent for Cameroon, Gabon, Chad, and Equatorial Guinea to 33 percent for Ethiopia. Nevertheless, African countries are imposing fewer tariff constraints on their African counterparts compared to countries in the Asia-Pacific, LAC, Eastern Europe, and BRICS regions. Low labor productivity, water stress and management practices, lack of technology, and dependence on imports are other serious challenges facing the development of cotton production and trade in Africa.

However, opportunities exist and should be seized. Africa has the potential to export $6.2 billion of cotton garments by 2026, with 15 percent of these exports within the African continent. Most of the African countries considered have a higher potential at lower levels (upstream) of the cotton value chain. Some countries have potential and comparative advantage in different stages (such as Egypt, Lesotho, and Mauritius) and are providers of inputs and outputs. Other countries are confined to inputs only (such as Benin, Burkina Faso, and Cameroon) and others to outputs only (Kenya and Cabo Verde).

To move forward, we offer four policy recommendations. First, the AfCFTA can be beneficial to African countries as it should increase intraregional exports. This will require further investment in infrastructure and addressing nontariff measures, especially RoO. Second, in order to diversify both products and destinations, large domestic or regional markets could help African exporters develop their final products as these can be exported to other African countries (whereas intermediate products are exported to advanced economies). Artisanal products, such as soap, could be produced from cotton processing waste. With more robust marketing and packaging strategies, this soap, currently chiefly consumed on the domestic market, could be exported. In West Africa, organic cotton (safer and more profitable) and biological forms of pest control and soil fertilization are being promoted to boost the demand for cotton. Third, African countries have implemented a few domestic policies to improve the cotton value chain, and several regional initiatives have also been implemented, some related to trade and others to cotton sustainability. To increase their effectiveness, these initiatives need to be more harmonized to avoid overlap and to be better financed and monitored to guarantee their sustainability. In addition, it is crucial to involve farmer associations to develop policies and measures in a bottom-up fashion, rather than the top-down approach that is currently used. Finally, providing technical and financial support to smallholder farmers is a must to improve their productivity and help them export.

References

Agarwal, P., F. Ismail, and V. Mkhabela. 2023. "AfCFTA and Rules of Origin for the Textile and Apparel Industry in Africa." ODI Working Paper. Overseas Development Institute (ODI), London.

Alvarez, J., and M.C. Ruane. 2019. "Informality and Aggregate Productivity: The Case of Mexico." IMF Working Paper WP/19/257. International Monetary Fund (IMF), Washington, DC.

AUC (African Union Commission)/OECD (Organisation for Economic Co-operation and Development). 2022. "Why Regional Value Chains Matter for Africa's Recovery." In *Africa's Development Dynamics 2022: Regional Value Chains for a Sustainable Recovery*, 33–67. Paris: OECD Publishing.

Baffes, J. 2009. "The Full Potential of Uganda's Cotton Industry." *Development Policy Review* 27 (1): 67–85.

Bouët, A., D. Laborde, F. Traoré, S. Ait Faraji, N. Darouich, F. Hamdaoui, and S. Tounsi. 2021b. "L'intégration du Maroc à la Zone de Libre-Echange Continentale (ZLECAf): Scenarii D'impacts à L'horizon 2035 et Politiques D'accompagnement." DEPF Policy Brief No. 26. Ministère de l'Economie et des Finances, Rabat.

Costinot, A., D. Donaldson, and I. Komunjer. 2012. "What Goods Do Countries Trade? A Quantitative Exploration of Ricardo's Ideas." *Review of Economic Studies* 79 (2): 581–608.

Dana, J., and M. Sadler. 2012. "Market-Based Approaches to Managing Commodity Price Risk." World Bank Working Paper No. 71263. World Bank, Washington, DC.

Delpeuch, C. 2009. "A Short Analytical History of Cotton Institutions in West Africa." GEM Working Paper, Groupe d'Economie Mondiale, Paris.

FAO (Food and Agriculture Organization of the United Nations). 2021. FAOSTAT statistical database. Accessed March 23, 2023. http://www.fao.org/faostat/en/#data.

Gergely, N. 2009. "The Benin Cotton Sector." Africa Region Working Paper Series No. 125. World Bank, Washington, DC.

Gerlach, A.C., and P. Liu. 2010. "Resource-Seeking Foreign Direct Investment in African Agriculture." FAO Commodity and Trade Policy Research Working Paper No. 31. FAO, Rome.

Guimbard, H., S. Jean, M. Mimouni, and X. Pichot. 2012. "MacMap-HS6 2007, an Exhaustive and Consistent Measure of Applied Protection in 2007." *International Economics* 130: 99–122.

Hilbert, I., T. Schleicher, and H.K. Tadesse Amera. 2018. *The Cotton Supply Chain in Ethiopia: A Country-Focused Commodity Analysis in the Context of the Bio-Macht Project*. Oeko-Institut, Freiburg, Germany.

Hsieh, C.-T., and P.J. Klenow. 2009. "Misallocation and Manufacturing TFP in China and India." *Quarterly Journal of Economics* 124 (4): 1403–1448.

ITC (International Trade Center). 2013. *Improving Africa's Cotton Value Chain for Asian Markets*. Geneva.

ITC. 2022. *Made by Africa: Creating Value through Integration*. Geneva.

Leromain, E., and G. Orefice. 2014. "New Revealed Comparative Advantage Index: Dataset and Empirical Distribution." *International Economics* 139: 48–70.

Mekonnen, M., and A.Y. Hoekstra. 2010. *The Green, Blue and Grey Water Footprint of Farm Animals and Animal Products*. Value of Water Research Report Series No. 48. UNESCO-IHE, Delft, Netherlands.

Mordor Intelligence. 2022. *Africa Cotton Market: Growth, Trends, and Forecasts (2023-2028)*. Hyderabad, India: Mordor Intelligence.

Morris, M., and J. Fessehaie. 2014. "The Industrialisation Challenge for Africa: Towards a Commodities Based Industrialisation Path." *Journal of African Trade* 1 (1): 25–36.

Peltzer, R., and D. Röttger. 2013." Cotton Sector Organisation Models and their Impact on Farmer's Productivity and Income." DIE Discussion Paper 4. German Development Institute, Bonn.

OECD/SWAC (Sahel and West Africa Club). 2009. "Cotton". In *Regional Atlas on West Africa, West African Studies*, Chapter 11. Paris: OECD Publishing.

Poulton, C., P. Gibbon, B. Hanyani-Mlambo, J. Kydd, W. Maro, M. Nylandsted Larsen, A. Osorio, D. Tschirley, and B. Zulu. 2004. "Competition and Coordination in Liberalized African Cotton Market Systems." *World Development* 32 (3): 519–536.

Poulton, C., and B. Hanyani-Mlambo. 2007. "Zimbabwe Country Study." Background paper for *Comparative Analysis of Organization and Performance of African Cotton Sectors: Learning from Reform Experience*. Washington, DC: World Bank.

Shaw, C.A., K.C. Jackson, and P.D.F. Kilduff. 1994. "Prospects for Upgrading in the Taiwanese Cotton Textile Industry." *Journal of the Textile Institute* 85 (2): 270–282.

Signé, L., and P. Madden. 2021. "Considerations for Rules of Origin under the African Continental Free Trade Area." *Journal of African Trade* 8 (2): 77–87.

Slimane, M.B., M. Huchet-Bourdon, and H. Zitouna. 2016. "The Role of Sectoral FDI in Promoting Agricultural Production and Improving Food Security." *International Economics* 145: 50–65.

Staritz, C., and B. Troster. 2015. "Cotton-Based Development in Sub-Saharan Africa? Global Commodity Chains, National Market Structure and Development Outcomes in Burkina Faso, Mozambique and Tanzania." ÖFSE Working Paper No. 54. Vienna: Austrian Foundation for Development Research (ÖFSE).

Textile Exchange. 2018. "About Organic Cotton." http://textileexchange.org/knowledge-center/reports/2018-organic-cotton-market-report/

Tschirley, D., C. Poulton, and P. Labaste. 2009. *Organization and Performance of Cotton Sectors in Africa: Learning from Reform Experience*. Washington, DC: World Bank.

Tschirley, D.L., C. Poulton, N. Gergely, P. Labaste, J. Baffes, D. Boughton, and G. Estur. 2010. "Institutional Diversity and Performance in African Cotton Sectors." *Development Policy Review* 28 (3): 295 –323.

UNECA (United Nations Economic Commission for Africa) and ATPC (African Trade Policy Centre). 2021. *Takeaways from the Expected Impact of AfCFTA's Implementation*. Addis Ababa: UNECA.

WEF (World Economic Forum). 2021. "COVID has Disrupted Africa's Cotton Production. Here's How Soap Could Provide a Solution." *Forum Agenda*, May 11. https://www.weforum.org/agenda/2021/05/cotton-byproducts-africa-economics-business-covid-coronavirus/

World Bank. 2020. *The African Continental Free Trade Area: Economic and Distributional Effects*. Washington, DC.

Appendix

Table A4.1 Comparison between different RCAs for African countries, 2017–2021

Country	RCA Balassa	RCA Costinot et. al (2012)
Egypt	11	29
Lesotho	10	23
Eswatini	10	19
Madagascar	9	19
Morocco	16	19
Tunisia	9	19
South Africa	25	14
Mauritius	11	13
Ethiopia	12	12
Zimbabwe	8	12
Tanzania	12	11
Côte d'Ivoire	4	8
Kenya	9	8
Benin	5	7
Burkina Faso	4	7
Cabo Verde	4	6
Senegal	5	6
Malawi	7	5
Uganda	7	5
Mozambique	7	4
Togo	6	4
Zambia	5	4
Algeria	4	3
Botswana	4	3
Cameroon	4	3
Mali	5	3
Namibia	21	3

Country	RCA Balassa	RCA Costinot et. al (2012)
Angola	8	2
Rep. of Congo	11	2
Dem. Rep. of the Congo	5	2
Ghana	16	2
Central African Rep.	4	1
Chad	3	1
Eritrea	6	1
Guinea	4	1
Sao Tome and Principe	5	1
Seychelles	12	1
Sudan	2	1
Burundi	15	
Comoros	7	
Djibouti	11	
Equatorial Guinea	2	
Gabon	13	
Gambia	8	
Guinea-Bissau	1	
Liberia	6	
Libya	4	
Mauritania	11	
Niger	6	
Nigeria	9	
Rwanda	15	
Sierra Leone	19	
Somalia	8	
South Sudan	1	
Western Sahara	1	

Source: Estimations using the 2023 AATM database.

CHAPTER
FIVE

Impact of the Russia-Ukraine War on African Agriculture, Trade, Poverty, and Food Systems

David Laborde, Greenwell Matchaya, and Fousseini Traoré

Introduction

On February 24, 2022, Russian troops entered Ukraine, sparking one of the most intense conflicts in recent years. As of September 2023, the conflict is still active and continues to raise concerns. Russia, Ukraine, and Belarus (which has been indirectly involved in the conflict) are key actors in world markets for two product groups critical for African countries: food (mainly cereals and vegetable oils) and fertilizers. With world markets already severely disrupted by the COVID-19 pandemic, the new crisis in the Black Sea region, combined with climate shocks around the world, has further disrupted supply chains and increased prices. Since African countries are net food and fertilizer importers, the situation continues to raise serious concerns. This chapter offers an in-depth analysis of the conflict's impact on Africa's agricultural and food systems, with particular attention to the food and fertilizer sectors, the two main channels through which the shock has been transmitted. It is important to understand the extent of Africa's exposure and vulnerability to the conflict's impacts, including the impact on the ground in Africa in terms of lost or delayed agricultural production and increased food security risks. Moreover, this is an opportunity for policymakers not only to develop solutions that will mitigate the impact of the present crisis at the national, regional, and continental levels, but also to learn from the experience for future crises. As countries respond, it is also important to respect and improve the trade rules at the global level to avoid measures that may exacerbate the effects of the crisis.

The chapter is structured as follows. In the next section, we set the scene by describing the key role played by Russia and Ukraine in world food and fertilizer markets along with the evolution of key commodity prices and the factors influencing them, such as measures restricting trade. In the following section, we examine Africa's dependence on world markets for food and fertilizers, with a focus on the role of Russia, Ukraine, and Belarus. This provides an overview of how African countries will be impacted by the conflict, with the impact proportional to the magnitude of the shock and the degree of exposure faced by different countries. We next explore the impacts of the conflict, first on African agrifood systems, then on poverty. In the final sections of the chapter, we present an overview of policy responses put in place in Africa to cushion the shocks, and provide some recommendations and conclusions.

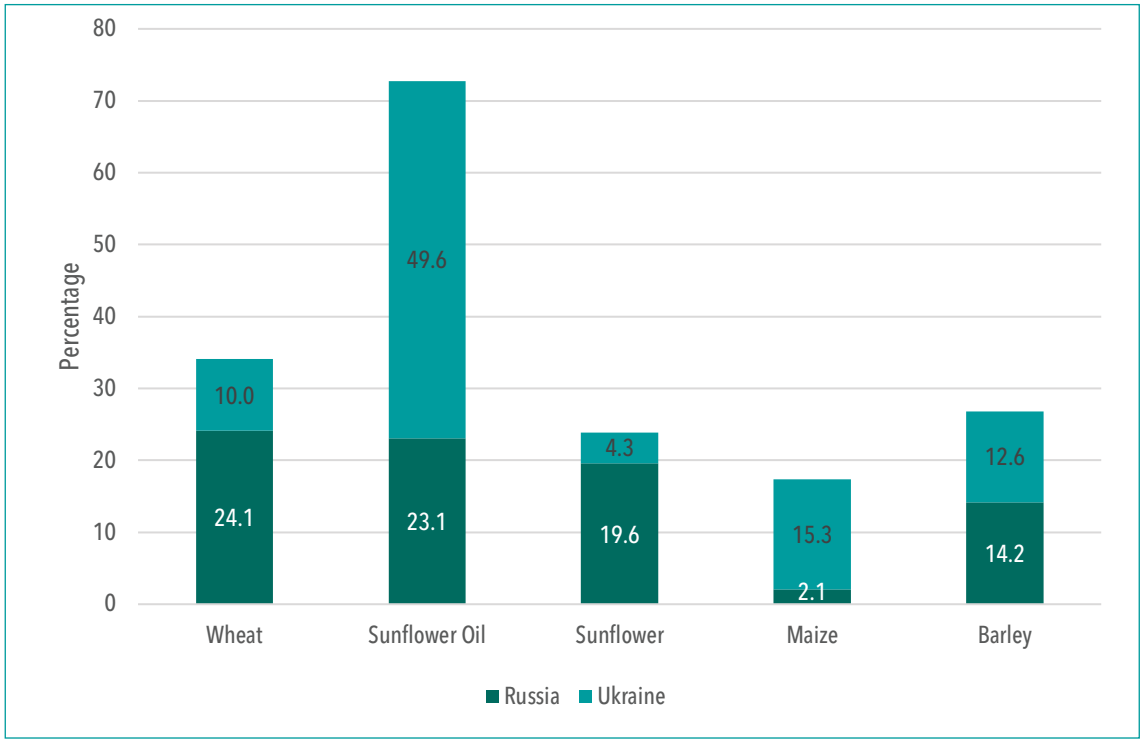
Setting the Scene

The key positions of Russia and Ukraine in world markets

Russia and Ukraine are large players in global cereal and oilseed markets (Figure 5.1). They account for more than a third of wheat exports and a quarter of barley exports. The figures are even more impressive for sunflower oil, with 72 percent of world market share accounted for by the two countries and almost 50 percent by Ukraine alone. Together, Russia and Ukraine represent 12 percent of total calories traded in the world (Glauber and Laborde 2022). Given this configuration, the beginning of the conflict raised significant concerns about the trade of cereals. Indeed, since Ukraine's main ports were blocked, millions of metric tons[1] of grain could not be exported, although some attempts were made through railroads in Poland with limited success. The supply disruptions also affected Russian exports due to the uncertainty and rising insurance costs in the Black Sea area.

1 Throughout this volume, tons refers to metric tons.

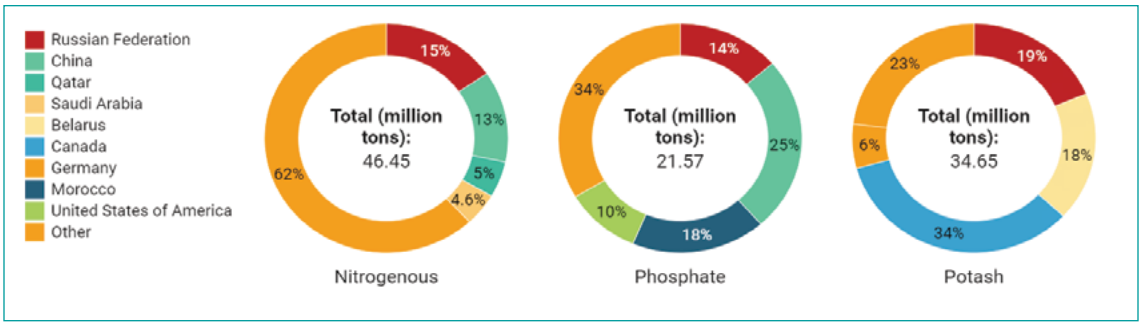
Figure 5.1 Share of Russia and Ukraine in world markets



Source: Glauber and Laborde (2022) and COMTRADE.

Russia and Belarus also play a key role in world fertilizer markets (Figure 5.2). Russia alone accounts for 15 percent of world trade in nitrogenous products and 14 percent of phosphate products. The market for potash is the most concentrated one, with Russia and Belarus together representing 37 percent of world trade. Only China plays a similarly large role, particularly for nitrogenous and phosphate products. Given that China has imposed export restrictions, the conflict in Ukraine has exacerbated tensions in a market already reeling from the aftermath of COVID-19 and other crises, including adverse weather conditions such as the 2021 droughts in Canada and the United States that affected global commodity supplies, including wheat. Also worth noting is the indirect impact of the fertilizer crisis on Ukraine's farmers, who normally sourced their fertilizer imports from Russia and Belarus. For Ukraine, the combination of fertilizer market disruptions, reduced output prices resulting from difficulties in accessing world markets, and the direct loss of farmland due to the war, is expected to cause a decline in 2023 grain production, and thus Ukraine's exports, undermining the global food supply and its resilience to future shocks.

Figure 5.2 Market shares of the main fertilizers exporters



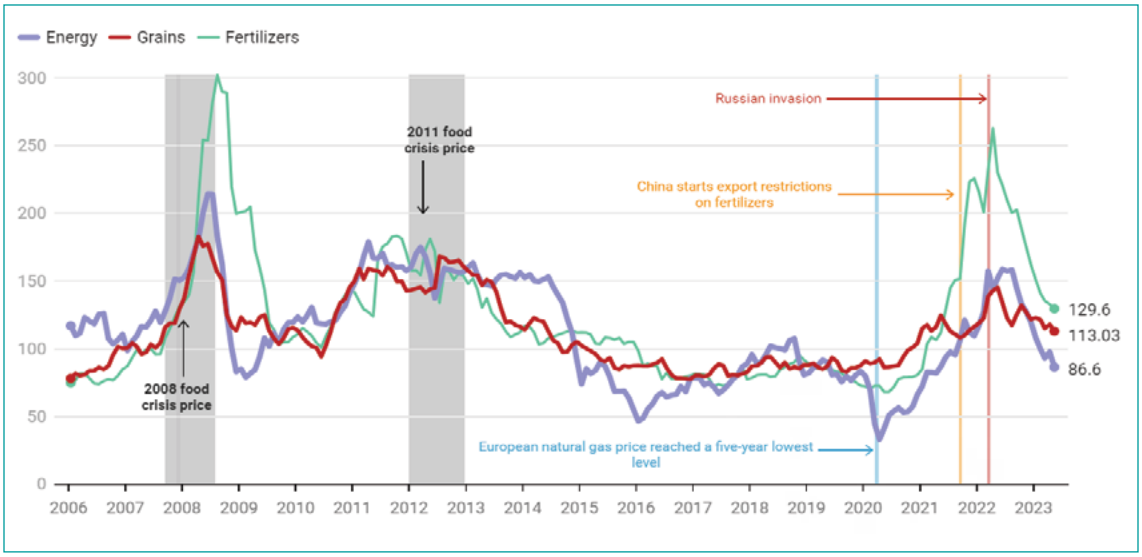
Source: FAOSTAT.

Evolution of food and fertilizer prices

World prices for food, energy, and fertilizers have increased significantly over the past two years, reaching their highest levels in March 2022 (Figure 5.3). From January 2021 to March 2022, grain prices increased by 21 percent and fertilizer prices by 162 percent. More important, the conflict in Ukraine began when global markets were already in turmoil. Since their peak in mid-2022, prices have been declining on world markets, based on their readjustment to a combination of positive supply conditions (crops) and expansion of supply capacity (fertilizers and crops), as well as reorganization of global trade flows to accommodate the new reality. Even in the context of improved market conditions in 2023, it is of critical importance to review their evolution in 2022 to properly understand the vulnerabilities of African economies to such shocks.

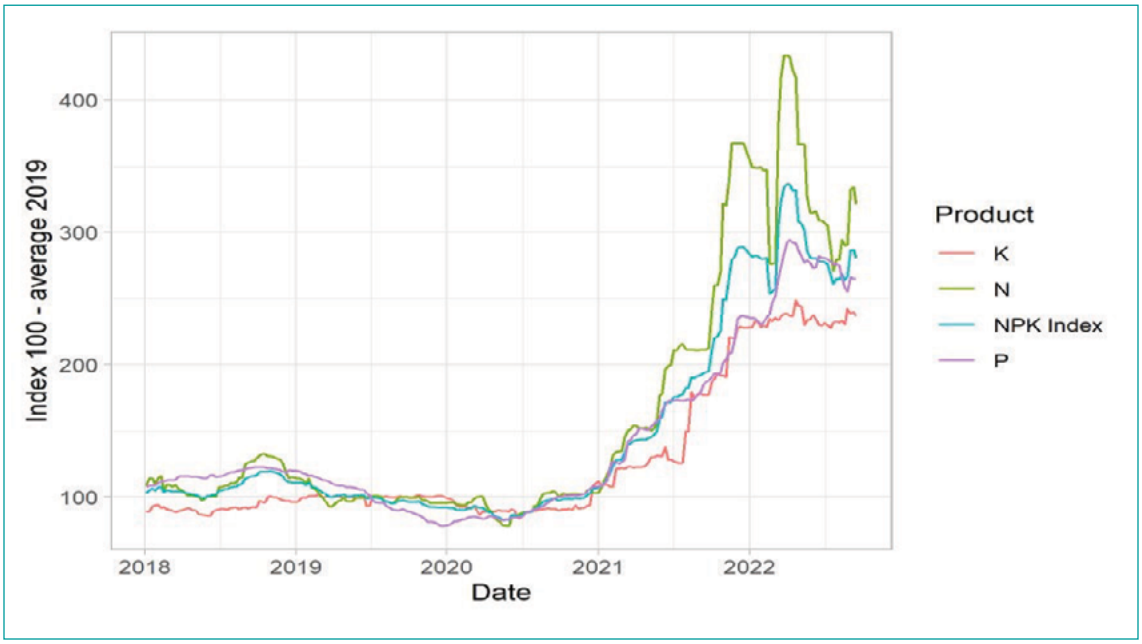
Indeed, before the crisis, fertilizer prices had already doubled from January 2021 to January 2022 and the increase between January and March 2022 represents only 17 percent of the total increase, although this was a substantial change for a three-month period. It is also worth noting that the price levels observed in the wake of the crisis are not historic highs. As shown in Figure 5.3, the peaks observed during the 2008 crisis were well above the current ones. A more disaggregated analysis shows that wheat and maize prices increased by 80 and 47 percent, respectively between January 2021 and May 2022, and by 39 and 24 percent just between January 2022 and May 2022 (World Bank 2022). For vegetable oils, the movements for soybean oil and sunflower seed oil prices are particularly notable: between January and May 2022, soybean oil prices increased by 34 percent and sunflower oil by 47 percent. Regarding fertilizers (Figure 5.4), the most significant increases were registered by nitrogenous products (+24 percent) and phosphate (+20 percent) between January and March 2022.

Figure 5.3 Evolution of grains, fertilizers, and energy prices (index based on US$ constant prices: 100 = average 2000–2020)



Source: Constructed with data from World Bank and U.S. Bureau of Labor Statistics.

Figure 5.4 Evolution of the prices of the main nutrients



Source: Constructed with data from the World Bank.

Note: N = nitrogenous; P = phosphorus; K = potassium. NPK index is the average of the three prices.

The evolution of prices is directly linked to supply and demand factors. Regarding fertilizers, demand was strong over the 2020–2021 period due to high crop prices. Demand for fertilizers rose by 6.3 percent in the 2020/21 crop year as farmers faced favorable fertilizer/crop price ratios (Hebebrand and Laborde 2022). On the supply side, many factors came into play. The most important is certainly the increase in production costs for most types of fertilizers. For

nitrogenous fertilizers, the increase in natural gas prices, one of the main inputs, has been fundamental. Together with soaring sulfur prices, the natural gas price increases drove an increase in phosphate-based fertilizer prices, since these are key elements to produce the latter. Furthermore, several countries (including China and Russia) put in place export restrictions on fertilizers, through quotas and taxes, that reduced global trade and accelerated the price increase. The start of the conflict and accompanying disruption thus exacerbated an already difficult market situation. The fact that the supply of fertilizers is highly concentrated amplified the problem. As shown in Figure 5.2, a few countries dominate the world market for fertilizers. The top three exporters represent one-third of nitrogenous products traded, 57 percent of phosphates, and 80 percent of potash.

Food prices evolved along similar lines. First, as fertilizers and energy represent key inputs in production, the same factors that led to high fertilizer prices contributed to increasing production costs for grains and vegetable oils. Grain prices have also been sensitive to the low level of stocks in 2020/21. For corn and wheat, ending stocks for the period were at the lowest point since 2012 and 2007, respectively. In other words, the grains market was already very tight when the war in Ukraine made it almost impossible for the country to export grain. The vegetable oil supply was also tight before the conflict began, due to drought in Brazil, Argentina, and Canada as well as typhoons in East Asia (Malaysia).[2] The onset of the war impacted sunflower oil exports primarily, for which Ukraine represents almost half of world trade (Figure 5.1). In addition, like fertilizers, export restrictions are also affecting a large part of vegetable oil trade. Vegetable oil prices are also under pressure stemming from the development of biodiesel sectors in the United States and South America. The biodiesel sector represented 15 percent of total vegetable oil use in 2022, up from less than 1 percent in 2003 (Glauber, Laborde, and Mamun 2022).

The specific impacts of export restrictions

The 2022 crisis has exacerbated the impact of pre-existing trade restriction measures that are particularly harmful for world trade. Indeed, almost a year before the start of the crisis, a number of export restriction measures were in place in key countries for both fertilizers and agricultural products, contributing to price increases and market volatility. Additional measures followed in the wake of the conflict. As of May 2022, 17 percent of world food and feed trade on a caloric basis was affected by export restriction measures in force in 23 countries, and overall, 32 countries (including major players such as Argentina, Belarus, China, India, Indonesia, Malaysia, Türkiye, Russia, and Ukraine) imposed 77 export restriction measures on food and feed trade (Glauber, Laborde, and Mamun 2023). These measures include export taxes, licensing requirements, and bans. In 2021, Russia was among the first countries to adopt such measures, first with a ban on wheat exports to the Eurasian Economic Union, then with licensing requirements for nitrogenous-based fertilizer exports. Other key countries to impose export restrictions measures for food or fertilizers include China, Ukraine, India, Indonesia, and Argentina.

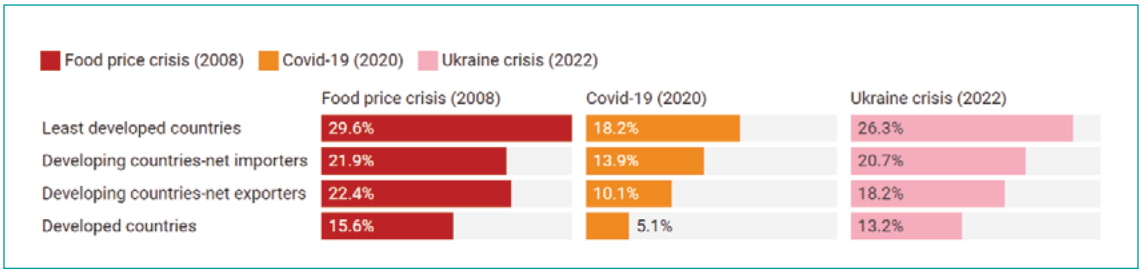
At the product level, the markets for vegetable oils and wheat are the most affected by trade restrictions. At the peak of the crisis in May 2022, of the 17 percent of global food trade affected by restrictions, wheat alone accounted for 5 percent. IFPRI's Food & Fertilizer Export Restrictions Tracker[3] reveals that in 2022, 43 percent of vegetable oils traded globally were affected by

2 The typhoons in Malysia reduced the supply of palm oil on the international market thereby contributing to scarcity of vegetable oils. https://www.ifpri.org/blog/impact-ukraine-crisis-global-vegetable-oil-market
3 IFPRI's Food & Fertilizer Export Restrictions Tracker is a monitoring tool that tracks restrictive policies put in place by countries. It also presents the impact of these restrictions as a percentage of each country's imported calories that are affected by the restrictive measures. https://public.tableau.com/app/profile/ifpri.food.security.portal/viz/shared/2CPYTB4G8

some form of export restriction. These measures were implemented by large players in world markets, such as Indonesia (bans on crude and refined palm oil) and Argentina (bans then taxes on soybean oil). A close analysis of the share of global trade affected by export restrictions and the FAO Food Price Index shows a strong correlation between the two data series (Glauber et al. 2023)—providing evidence of the impact of the measures on prices.

A comparison of the three recent major crises (Figure 5.5) shows that the Russia-Ukraine war has had an impact on global markets similar to the 2008 food price crisis, but much greater than the COVID-19 pandemic, although we must consider that the current crisis occurred in an environment already subject to trade tensions and restrictions and at a period when most countries were still recovering from the pandemic. The countries most affected by the Russia-Ukraine crisis are in the developing world, particularly the least developed countries, which have seen more than 26 percent of their imported calories affected (Figure 5.6). In Africa, the countries most affected include Egypt and Sudan with half of their imports affected, and to a lesser extent Uganda, Libya, and Kenya. Like food products, fertilizer imports in developing countries are also strongly affected by export restrictions. In Africa, Cameroon, Angola, Côte d'Ivoire, and Ghana are the most affected countries (Figure 5.7). The next section discusses the dependence of African nations on world markets for food and fertilizers.

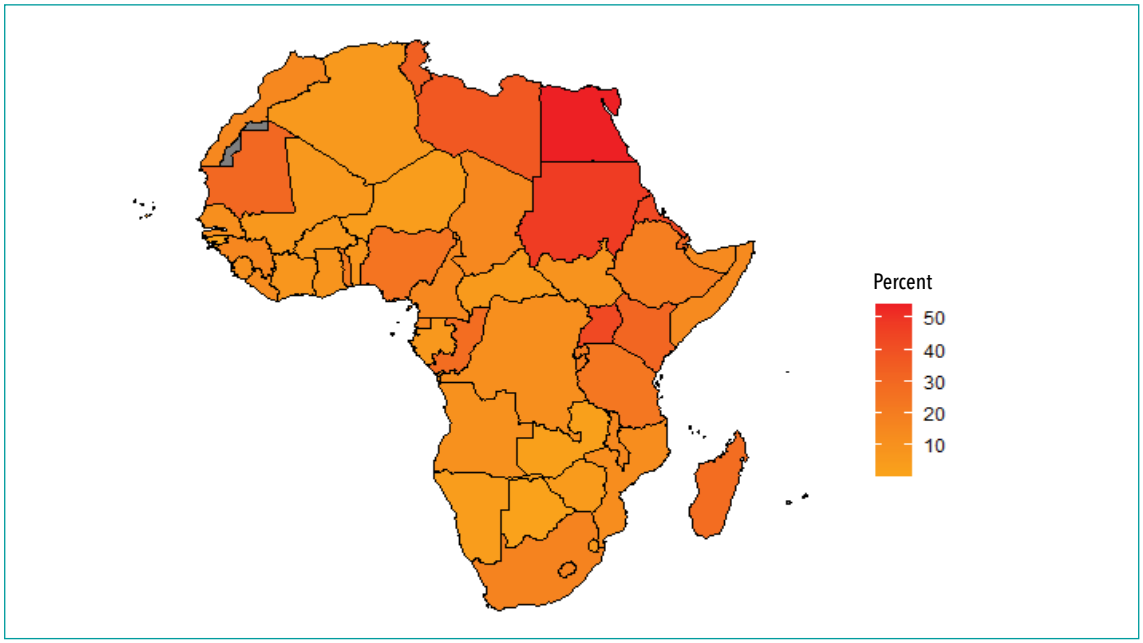
Figure 5.5 Share of imported calories impacted by export restrictions



Source: IFPRI Food & Fertilizer Export Restrictions Tracker.

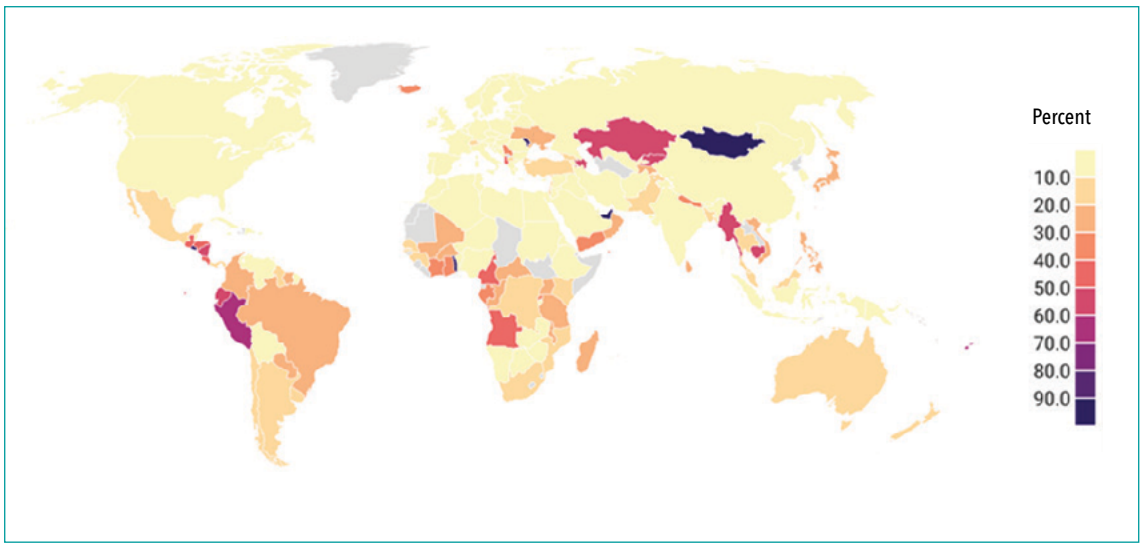
Note: Numbers include products used for food, feed, or energy. Intra-EU trade excluded from computations.

Figure 5.6 Share of imported calories impacted by export restrictions in African countries



Source: Glauber, Laborde, and Mamun (2022).

Figure 5.7 Share of fertilizers imports impacted by exporter restrictions



Source: Laborde and Mamun (2022).
Note: Trade flows impacted by sanctions not included.

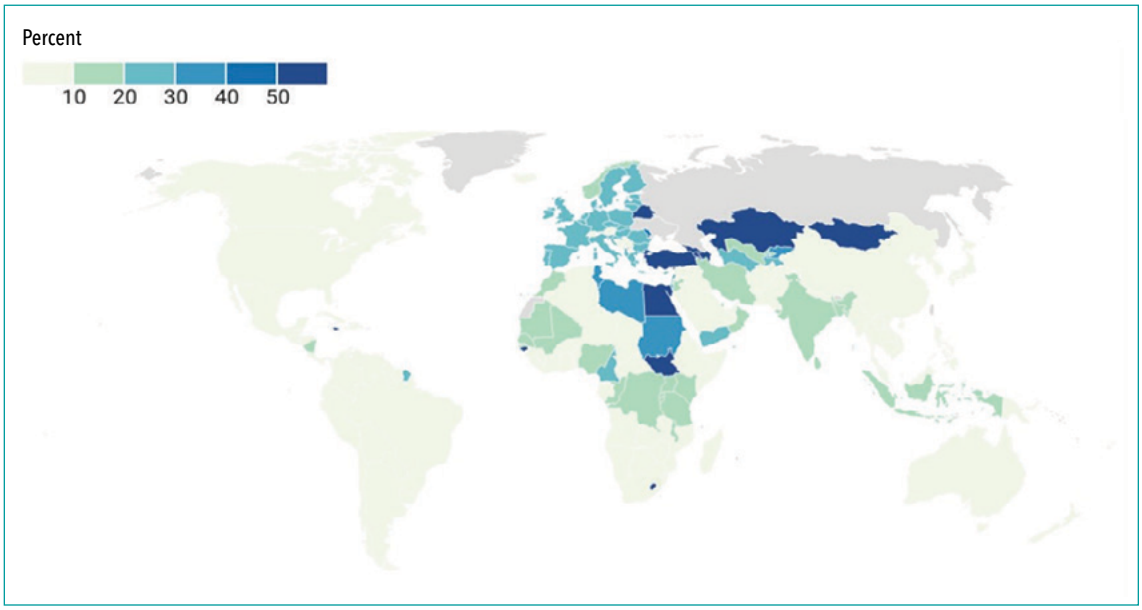
Africa's Dependence on World Markets for Food and Fertilizers

This section discusses the enormous dependency that African markets have on world markets for food and fertilizers and highlights how this may explain the significant effects that world market disruptions tend to have in Africa.

Cereals

The impact of the Russia-Ukraine war on African countries is a function of the size of the shock and the degree of dependency (exposure) of these countries on trade from the conflict area. Many African countries depend on Russia and Ukraine for their food imports in many aspects. Figure 5.8 illustrates the dependency of countries around the world on imported calories from Russia and Ukraine. Overall, almost half of African countries rely on Russia and Ukraine for at least 10 percent of their calorie imports, and eight African countries are particularly dependent, relying on Russia and Ukraine for more than 30 percent of their imports. These countries are Egypt, Sudan, South Sudan, Libya, Tunisia, Cameroon, Guinea–Bissau, and Lesotho (ordered from most dependent to less dependent).

Figure 5.8 Share of the Russian Federation and Ukraine in imported calories



Source: Laborde and Mamun (2022)
Note: EU countries are considered as one market.

For wheat, which makes up more than half of imports, the exposure is higher, with 11 countries dependent on Ukraine and Russia for more than half of their wheat imports (Badiane et al. 2022c). Overall, almost half of African countries have a moderate to high exposure to the crisis; those at highest risk are Benin, Egypt, Republic of Congo, Tanzania, Cabo Verde, Togo, Namibia, the Democratic Republic of the Congo (DRC), Libya, Madagascar, and Senegal. Among this group, the cases of Egypt, Benin, and the DRC are particularly alarming—more than 75 percent of their imports come from the conflict region. A second group of 10 countries also has a worrisome degree of exposure with import shares from Russia and Ukraine between 25 and 50 percent.

The dependence of African countries on Ukrainian and Russian imports becomes more problematic as the overall share of imports in domestic consumption rises. Table 5.1 presents

a classification of African countries along the two dimensions: dependence on imports in general and dependence on imports from Ukraine and Russia in particular. The higher the two figures, the more exposed the country is to the conflict's impacts. At the righthand side of the table (shaded), a group of 11 countries is critically exposed, with more than half of their imports coming from Ukraine, Belarus, and Russia and import penetration rates (share of imports in domestic consumption) above 50 percent. These countries are Benin, Libya, Egypt, Tanzania, Cabo Verde, Madagascar, Namibia, DRC, Togo, Senegal, and Republic of Congo. Countries like South Africa and Tunisia also are at risk, although less so than the first group. Finally, the larger the share of wheat in national diets, the greater the impact of the crisis. This is particularly the case in North African countries.

One particular aspect worth mentioning is the indirect exposure of some countries, a phenomenon often referred to as "contagion through regional re-exports" (Badiane et al. 2022a). Indeed, some countries re-export a significant part of their imports to their neighbors. This is the case in West Africa with Côte d'Ivoire and Senegal re-exporting within the region and in Southeastern Africa with South Africa and Kenya re-exporting to neighboring countries.

Table 5.1 Summary of the situation of selected African countries for wheat imports in 2020

Wheat		Dependency on imports from Ukraine, Belarus, and Russia (share in country wheat imports)			
		0–25%	25–50%	50–75%	75–100%
Import penetration rate (imports/domestic consumption)	0–25%	Ethiopia			
	25–50%	Zimbabwe, Morocco, Zambia			
	50–75%	Algeria	South Africa, Tunisia	Libya	Egypt
	75–100%	Gabon, Burkina Faso, Nigeria, Central African Republic, Comoros	Mali, Kenya	United Republic of Tanzania, Cabo Verde, Madagascar	Republic of Congo
	>100%	Guinea, Côte d'Ivoire, Niger, Botswana, Eswatini, Mauritius	Burundi, Lesotho, Uganda, Mauritania, Cameroon, Ghana, Malawi	Namibia, Democratic Republic of the Congo, Togo, Senegal	Benin

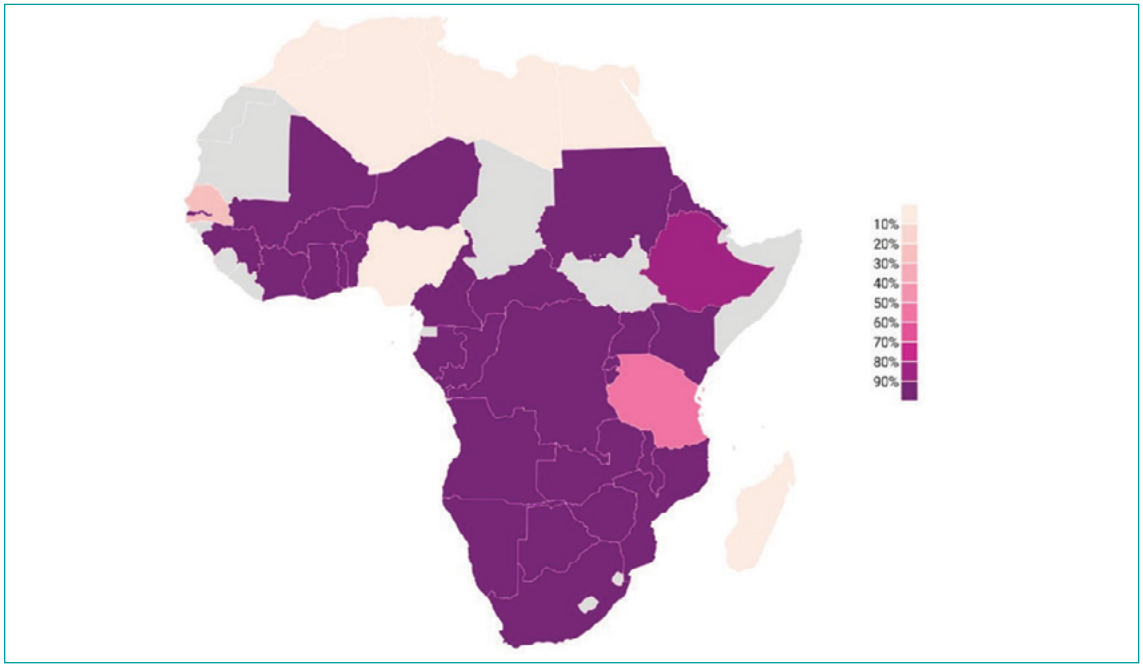
Source: Authors based on Badiane et al. (2022a).

Fertilizers

The dependence of African countries on fertilizer imports from the conflict zone is also high. Overall, more than half of African countries import fertilizer from either Russia or Ukraine, with countries including Benin, Nigeria, and the Central African Republic facing import dependency ratios above 45 percent (Badiane et al. 2022b).

A close look at the composition of fertilizer imports reveals that African countries are dependent for all types of products. Figure 5.9 shows the degree of dependency for nitrogenous fertilizers. In more than two-thirds of African countries, the share of imports in domestic use is above 80 percent.[4] Only countries like Nigeria and those in North Africa with natural gas endowments are exceptions. Indeed, natural gas is a key input for nitrogenous fertilizers through its role in the production of ammonia and urea. When we look just at nitrogenous fertilizer imports from Russia and Belarus, the figures on dependency are a bit lower (Figure 5.10, Panel a). For potassium fertilizers, the dependence of African countries on imports from Russia and Belarus is much higher (Panel b). Countries in West Africa are the most exposed for these products, with dependency ratios often above 80 percent. This is the most problematic situation, as the market for potassium fertilizers is globally the most concentrated and few alternative sources exist on the continent or worldwide.

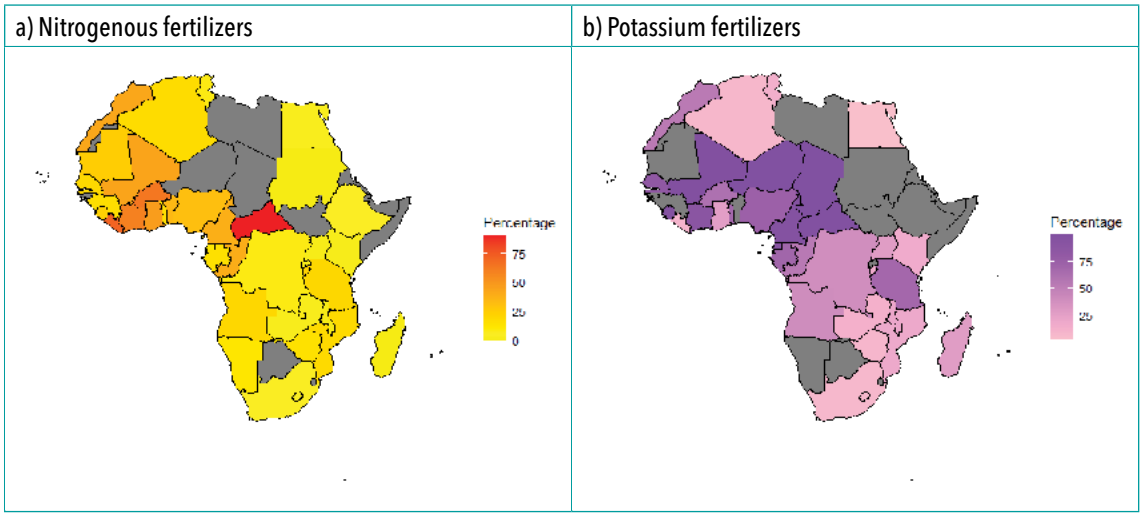
Figure 5.9 Dependence on world markets for nitrogenous fertilizers



Source: FAOSTAT.

4 Including imports from other African countries.

Figure 5.10 Percentage of imports from Russia and Belarus by country



Source: COMTRADE.

As with food products, the impact of the fertilizer crisis on African countries will be a function of the overall dependency of countries on imports and the share of flows coming from the conflict region. Table 5.2 classifies African countries along these two dimensions. The group of countries at the bottom right of the table are the most likely to be negatively impacted by the crisis, with import penetration rates above 25 percent and a dependency ratio to Ukraine and Russia above 30 percent. However, composition of fertilizer demand matters here. Indeed, for some type of fertilizers, notably potassium products, the degree of exposure is much higher than the aggregate exposure presented in Table 5.2.

Table 5.2 Summary of the situation of African countries for fertilizer imports

Fertilizers		Dependency on imports from Ukraine and Russia (share of total imports), 2020				
		No imports	< 15%	15–30%	30–45%	>45%
Import penetration, average 2015-2019 (imports/domestic consumption)	No data	Mauritius, Madagascar, Sao Tome and Principe, Seychelles, Equatorial Guinea	Algeria	Morocco, Togo		
	0–25%	Eswatini, Comoros, Chad, Guinea-Bissau, Djibouti, Somalia	Tunisia, Egypt, Sierra Leone	Mauritania, Cabo Verde, Liberia	Senegal	
	25–75%					Nigeria
	75–100%	Eritrea				Central African Republic
	>100%	Botswana, Ethiopia, Zambia, Malawi, Libya, Rwanda, Sudan, Gambia, South Sudan	Guinea, Zimbabwe, Gabon, Burkina Faso, Burundi, Lesotho, South Africa, Mali, Namibia, Congo, Mozambique, Angola	Côte d'Ivoire, Uganda, Kenya, Democratic Republic of the Congo	Niger, Cameroon, Ghana	Benin

Source: Authors based on Badiane et al. (2022b).

When we group African countries according to their dependency on imports from the conflict area for food and for fertilizers, we see little overlap between the two groups. Table 5.3 presents a summary. Countries that are heavily dependent on wheat imports from the conflict zone rarely rely heavily on fertilizer imports. Only four countries (Senegal, Cameroon, Ghana, and Benin) present a moderate to high level of exposure for *both* food and fertilizers. Nevertheless, the fact that many countries are heavily dependent on food *or* fertilizer imports means they are highly exposed to risks.

Table 5.3 Summary of the combined situation of African countries for both food and fertilizer imports

		Dependency on imports from Ukraine, Belarus, and Russia (share in country wheat imports)		
		0–25%	25–50%	>50%
Dependency on imports from Ukraine, Belarus, and Russia (share in country fertilizer imports)	0–30%	Ethiopia, Zimbabwe, Morocco, Zambia, Algeria, Gabon, Burkina Faso, Comoros, Guinea , Côte d'Ivoire , Botswana , Eswatini , Mauritius	South Africa, Tunisia, Mali, Kenya, Burundi, Lesotho, Uganda, Mauritania, Malawi	Libya, Cabo Verde, Madagascar, Namibia, Democratic Republic of the Congo, Togo, Egypt, Rep. of Congo
	30–45%	Niger	Cameroon, Ghana	Senegal
	>45%	Nigeria, Central African Republic		Benin

Source: Authors based on Badiane et al. (2022c; 2022d).

The next sections discuss the effects of the Russia-Ukraine crisis on African agrifood systems and poverty. They highlight the effects of the war on commodity prices as well as household consumption and incomes.

Impacts on Agrifood Systems and Poverty

After presenting the dependency of African countries on food and fertilizers imports, the next sections discuss the effect of the war on agrifood systems and poverty.

Staples and cash crops

Dependence on different types of fertilizers

We first present an overview of fertilizer availability and affordability in Africa in the wake of the crisis. Since the 2020 COVID-19 pandemic, Africa Fertilizer Watch has managed a dashboard for monitoring the fertilizer markets in selected African countries. As highlighted in Table 5.4, as of August 2022—the middle of the growing season in most countries covered by the dashboard—the situation was critical. Fertilizer availability (supply)[5] for 11 of the 12 countries for which data are available was deemed moderate or lower, with Malawi, Zimbabwe, Uganda, and Mozambique most at risk of serious shortfalls. Regarding affordability, the situation was worse: in 8 of the 12 countries, price increases were more than 25 percent from the previous month and for 3 countries prices were up more than 50 percent. Overall, the onset of the crisis jeopardized the 2022/23 growing season in many countries. In West Africa for instance, unmet fertilizer demand as of April 2022 varied from 5 percent (Togo) to 88 percent (Burkina Faso) and prices had increased between 47 percent (Nigeria) and more than 200 percent (Ghana) compared to 2021 (ECOWAS, FAO, and WFP 2022). A similar pattern is observed in East Africa, where prices doubled in many countries in one year, particularly for di-ammonium phosphate (DAP) and calcium ammonium nitrate (CAN). Overall, fertilizer price increases ranged from 20 percent for CAN in Kenya to 112 percent for DAP in Uganda (WFP 2022).

5 Unfortunately, Africa Fertilizer Watch does not provide a precise indicator or threshold on which the classification is made.

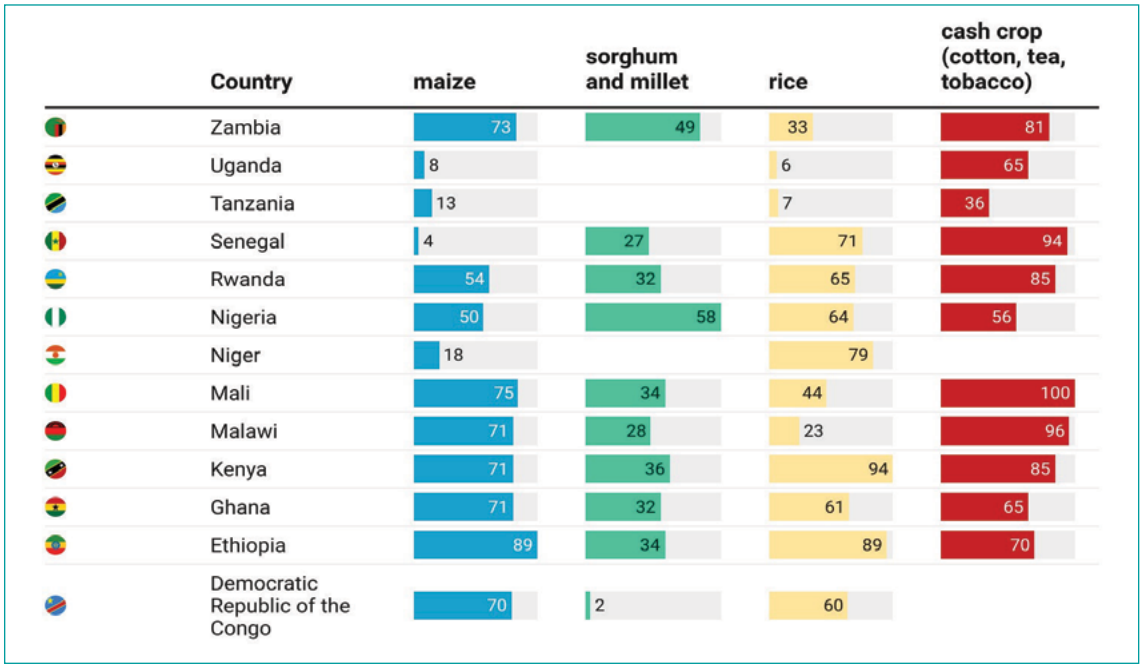
Table 5.4 Availability and affordability of fertilizers in selected countries, August 2022

		Affordability →			
		Stable or decrease	Increase of <25%	Increase of 25–50%	Increase of >50%
Availability →	Low or none	Malawi			Uganda
	Limited		Zimbabwe		Mozambique
	Moderate	South Africa		Ghana, Kenya Rwanda, Zambia Tanzania	Ethiopia
	Strong		Nigeria		

Source: Africa Fertilizer Watch, https://africafertilizerwatch.org/

The main impact of the fertilizer crisis on agrifood systems in Africa will be reductions in use, due to both the price and availability effects. In general, producers tend to use fertilizers first for the most profitable crops, which are usually cash crops (Figure 5.11). The high share of cultivated areas using fertilizers that are devoted to cash crops also reflects the fact that these are more organized sectors with inputs furnished by downstream buying companies (the cotton sectors in West Africa, for instance). However, cross utilization is also possible, as between cotton and maize. Overall, the projected impacts of the crisis on yields and production are considerable, particularly given that fertilizer application rates and yields in Africa were among the lowest in the world even before the crisis. In East Africa, for example, cereal production is projected to decrease by 16 percent (7.4 million tons) compared to the previous cropping year and the number of food insecure people is expected to rise by 7 million (WFP 2022).

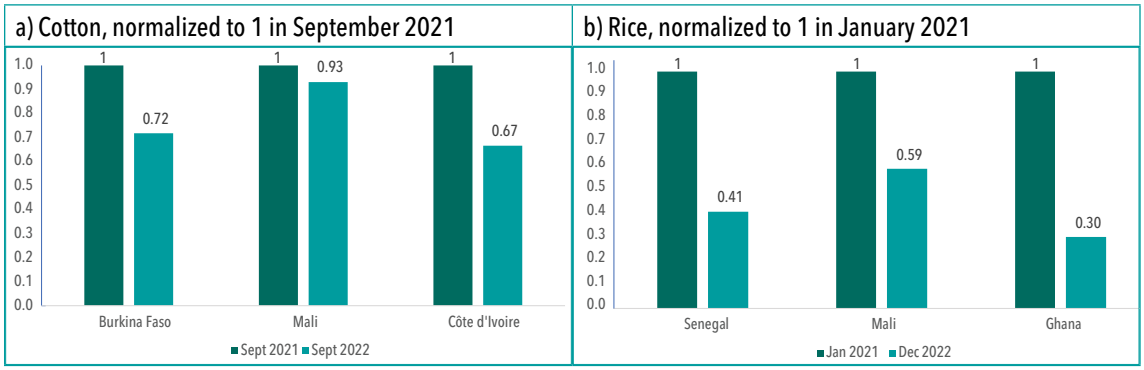
Figure 5.11 Share of smallholders' cultivated areas using fertilizers (%)



Source: Diao et al. (2022a-2022j).

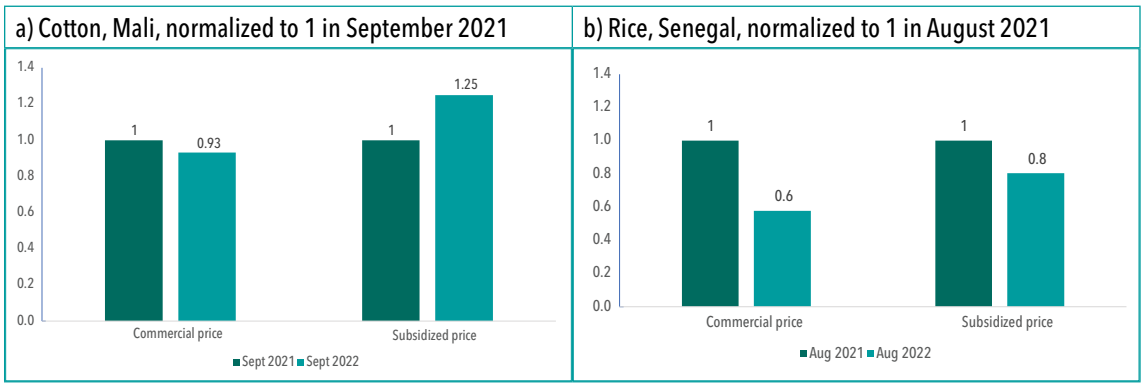
When analyzing the impact of the crisis on agrifood systems, the evolution of the ratio of crop prices to fertilizer prices is paramount as this will drive producers' decisions. Figure 5.12 presents the evolution of this ratio for selected products in several countries. The broad picture we see is that the ratio deteriorated significantly between 2021 and 2022, which has been detrimental to producers, particularly producers of food crops. In countries like Ghana, the ratio decreased by two-thirds. To fully understand the situation, however, we need to consider the subsidy programs in force in African countries, which allow farmers to purchase inputs at below market price. Such programs exist in many African countries, including Senegal, Mali, Burkina Faso, Kenya, and Ghana (we limit the analysis to the countries considered here). Figure 5.13 presents the crop/fertilizers price ratios in two countries (Mali and Senegal) at commercial and subsidized prices. When taken into account, the subsidy significantly dampens the negative evolution of the price ratio (rice in Senegal) and even negates it (cotton in Mali). The impact of subsidies should therefore qualify the previous analysis conducted with commercial prices.

Figure 5.12 Ratio of cotton and rice prices to commercial urea prices



Source: AfricaFertilizer, https://ifdc.org/projects/africafertilizer-org/; https://ifdc.org/projects/africafertilizer-org/

Figure 5.13 Ratio of cotton and rice prices to commercial and subsidized urea prices



Source: AfricaFertilizer, https://ifdc.org/projects/africafertilizer-org/

The next section discusses the evolution of local and world prices for various food items and highlights the relationships between them.

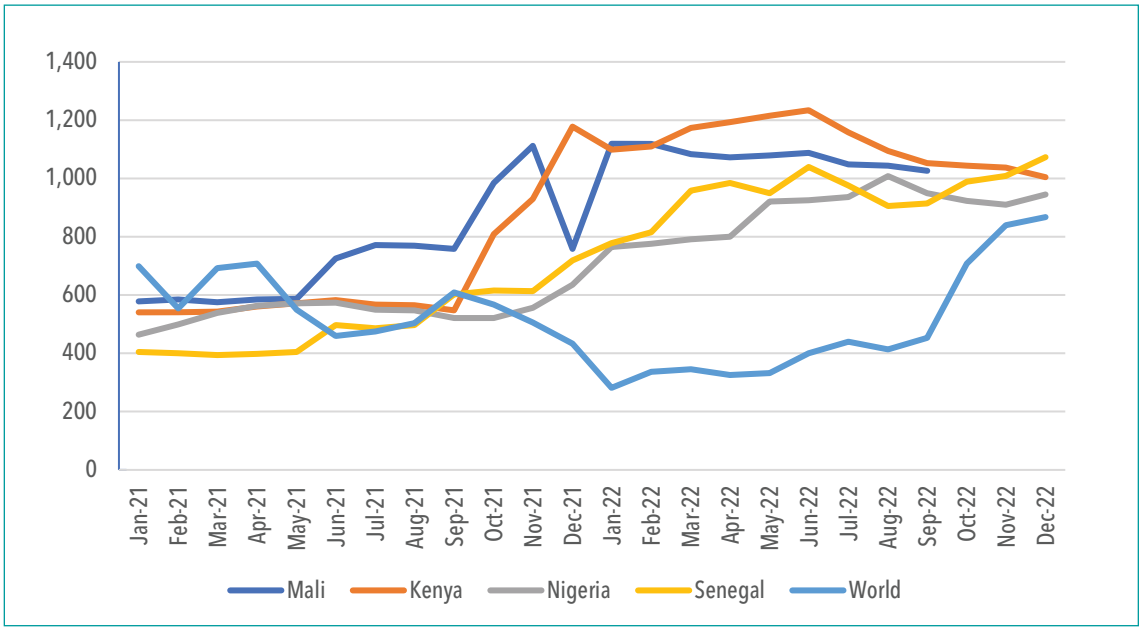
Evolution of local vs. world prices: Price transmission

Rising food and fertilizer prices are one of the key transmission channels of the crisis to Africa. The evolution of world prices observed earlier in this chapter was largely transmitted to local markets, although some mitigation measures cushioned the shock. Figure 5.14 shows the

evolution of world and domestic prices of urea, one of the most commonly used fertilizers, in selected African countries. While domestic prices in some countries seem to follow the pattern of world prices, in other countries domestic prices stabilized after peaking in June 2022. From January to December 2022, world urea prices tripled while domestic prices increased by just 23 percent in Nigeria and 37 percent in Senegal. Domestic prices remained stable over the year in Mali and Kenya. We computed pairwise correlations between world and domestic prices and found they were not significant for the January to December 2022 period, with the exception of Nigeria. Several factors may explain the lack of significance of the correlation coefficients including delays and lags in price changes and stabilization policies (implemented through subsidies in Kenya, Mali, and Senegal). In addition, while prices may have remained stable in some countries in 2022, prices had already reached very high levels before the crisis. Perhaps more importantly, we looked at only a few countries, as shown in Figure 5.14; Table 5.4 presents a broader picture.

World and domestic food prices also follow a similar pattern (Figure 5.15). Local prices increased in all the considered countries from January 2022 to their peaks in May or June 2022, with increases ranging from 6 to 15 percent. In general, in most of the countries, all food prices increased, including those of close substitutes for wheat. Thus, in East Africa for instance, the average per capita monthly price of the local food basket increased by 22 percent between January and May 2022 and by 54 percent compared with 2021 (WFP 2022). However, the coefficients of correlation we computed were not statistically significant for the post-crisis period.[6] In addition to the limitations mentioned for fertilizer prices, the decorrelation in 2022 for wheat prices may also be explained primarily by the policy responses put in place to reduce price transmission. These included subsidies, duty and tax remissions, local export bans, and other price controls or price setting mechanisms. As previously mentioned, the conflict occurred in an environment of very high prices and added an additional threat that pushed policymakers to initiate or increase public interventions to stabilize prices.

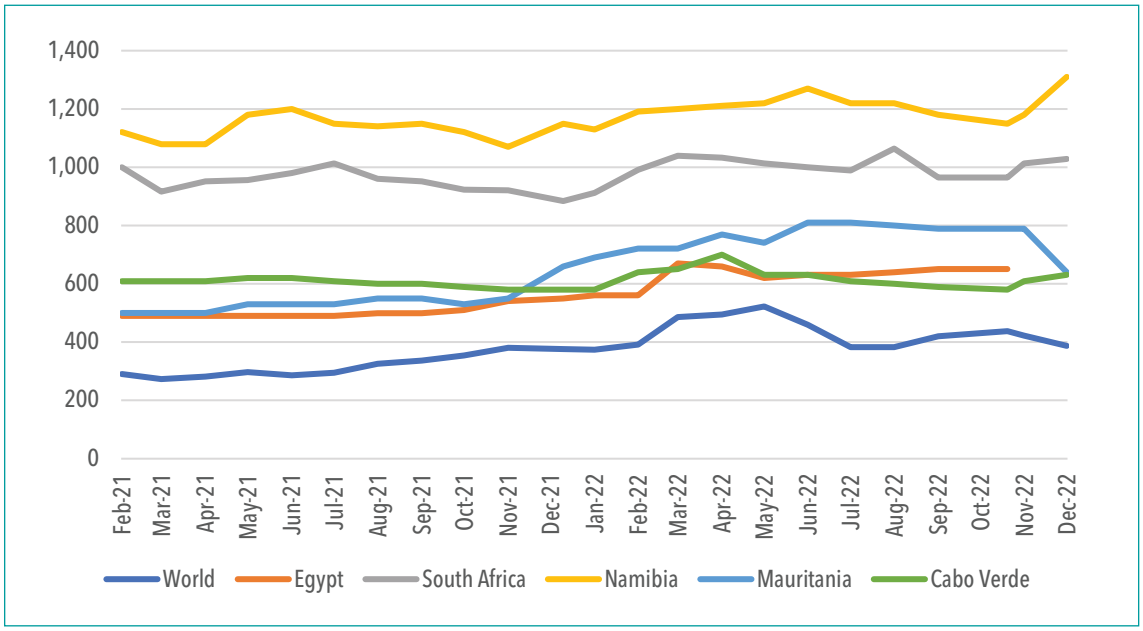
Figure 5.14 Evolution of world and domestic urea prices (US$/metric ton)



Source: Constructed with data from AfricaFertilizer (https://ifdc.org/projects/africafertilizer-org/) and World Bank.

6 In addition, there might be non-linearities in the relationship that are not properly captured by a linear coefficient of correlation.

Figure 5.15 Evolution of world and domestic wheat prices (US$/metric ton)



Source: FAO GIEWS.

Impacts of the Russia-Ukraine War on Poverty

This section discusses how the Russia-Ukraine crisis has affected indicators of poverty in Africa, including GDP growth, employment, consumption by households, and the cost of a healthy diet. Considering that the nature and speed of impacts on these indicators is likely to be heterogeneous across countries, income status, locations, and commodities, this section organizes the discussion along these lines. The evidence is presented by country, by income classification of the countries, share of agriculture in countries' GDP, by location (rural versus urban), and by local markets. The analysis of these impacts is based on past work and data generated by AKADEMIYA2063 and the International Food Policy Research Institute through a series of computable general equilibrium modeling exercises designed to examine the effects of the crisis on various components of the agriculture sector. Many of the results derive from the simulations carried out after implementing an economywide analysis of each country using IFPRI's Rural Investment and Policy Analysis (RIAPA) model[7] to estimate the impacts of the global price shocks on all sectors, workers, and households

Local market price changes for selected commodities

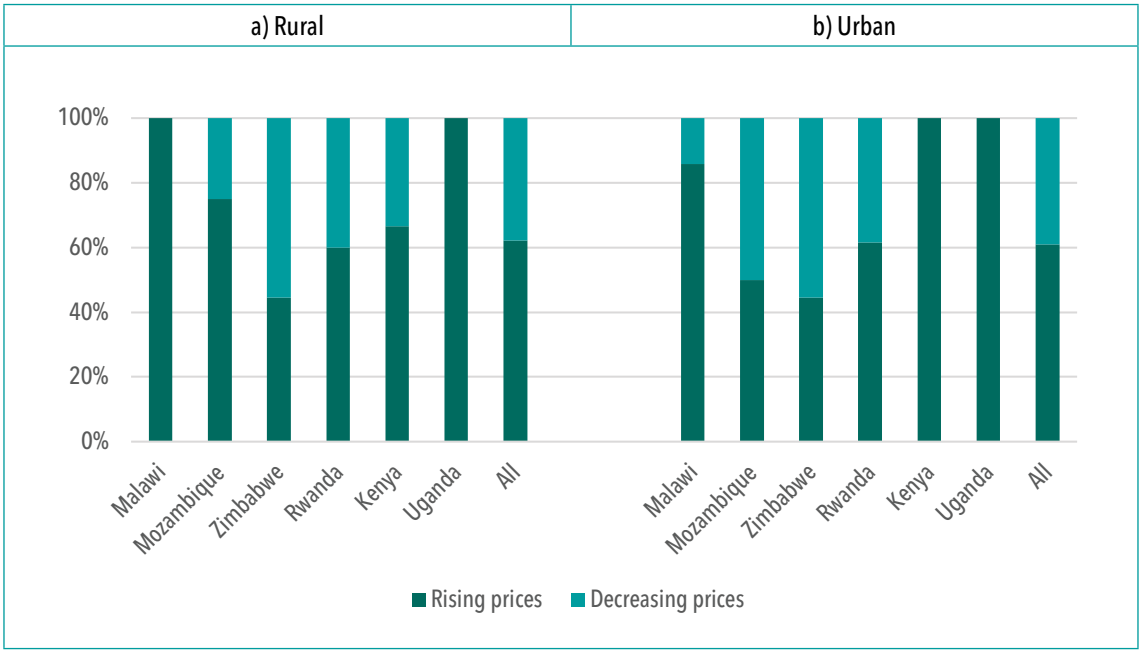
The subsections below present local market price changes for selected commodities and for selected countries following the onset of the Russia-Ukraine war. The choice of countries and commodities used to evaluate the war's impact was determined by the availability of data at the time of the study.

Figure 5.16 summarizes the weekly-observed negative and positive price changes in local rural and urban markets of six African countries where sufficient data were available, namely Malawi, Mozambique, Zimbabwe, Rwanda, Kenya, and Uganda. From a theoretical perspective, the effects of the Russia-Ukraine war may be transmitted into local markets for various commodities

7 The Rural Investment and Policy Analysis (RIAPA) data and modeling system is IFPRI's primary tool for forward-looking, economy-wide country-level analysis, serving as a simulation laboratory for experimenting with policies, investments, or economic shocks. Information on the RIAPA data and modeling system can be found here (https://www.ifpri.org/project/riapa-model).

in other countries through its impact on terms of trade as well as exchange rates. The scarcity created by the war for some commodities including wheat, cooking oils, and fuels increases import costs for net importers (although it may improve terms of trade for net exporters). African countries are dependent on international markets to meet a large portion of their wheat, vegetable oils, and fuels demand and are thus expected to experience inflationary effects of the war. These effects would differ between urban and rural markets depending on the combined effects of local production in rural areas and higher urban incomes. It is clear from Figure 5.16 that prices increased more often than they decreased in both urban and rural markets in all countries except Zimbabwe, where the frequency of increasing prices was below 50 percent. Malawi, Uganda, and Kenya experienced the most frequent wheat price increases in both rural and urban markets, followed by Mozambique and Rwanda (see Matchaya 2022a, 2022b; Guthiga 2022a, 2022c).

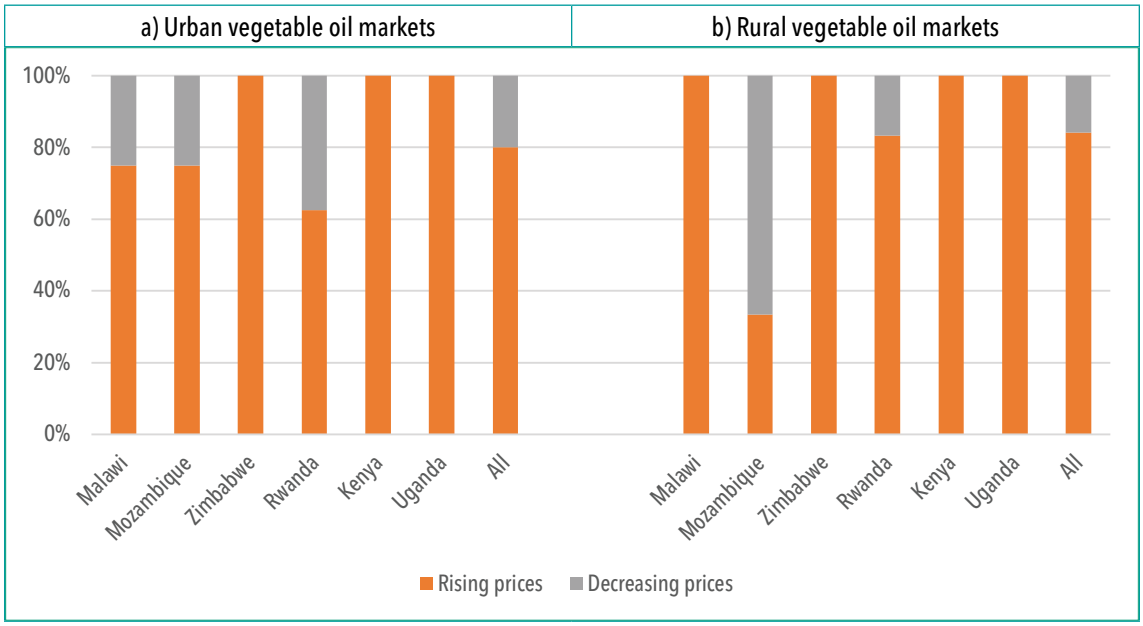
Figure 5.16 Frequency of episodes of increasing and decreasing wheat prices in local urban and rural markets



Source: Constructed using data from the Ministry of Agriculture, Malawi (2022); Ministry of Agriculture, Mozambique (2022); Ministry of Agriculture, Zimbabwe (2022); National Institute of Statistics and Ministry of Agriculture and Animal Resources, Rwanda (2022); Bureau of Statistics, Uganda (2022); and Ministry of Agriculture, Livestock, Fisheries, and Co-operatives, Kenya (2022).

Through international contagion effects and the impact of the Russia-Ukraine war on international markets for sunflower seed oil and other cooking oils, other countries experienced increasing prices as well, depending on whether they were net importers or exporters of cooking oils. Figure 5.17 shows that prices for cooking oils increased frequently in many rural and urban markets, with episodes of increases being more frequent than decreases in Zimbabwe, Kenya, Uganda, and Malawi; the only exception is the rural markets of Mozambique, where prices fell more often than they rose. The price increases in cooking oils were directly related to the scarcity created by the Russia-Ukraine war, since the share of sunflower oil trade by Russia and Ukraine was significant at the beginning of the war, and many of the cooking oils consumed in Africa were vegetable based, and as ready substitutes also saw price increases. Guthiga (2022a) observed that in many of Kenya's markets, cooking oil prices rose by around 27 percent, while the increase was around 30 percent in Uganda between February and June 2022.

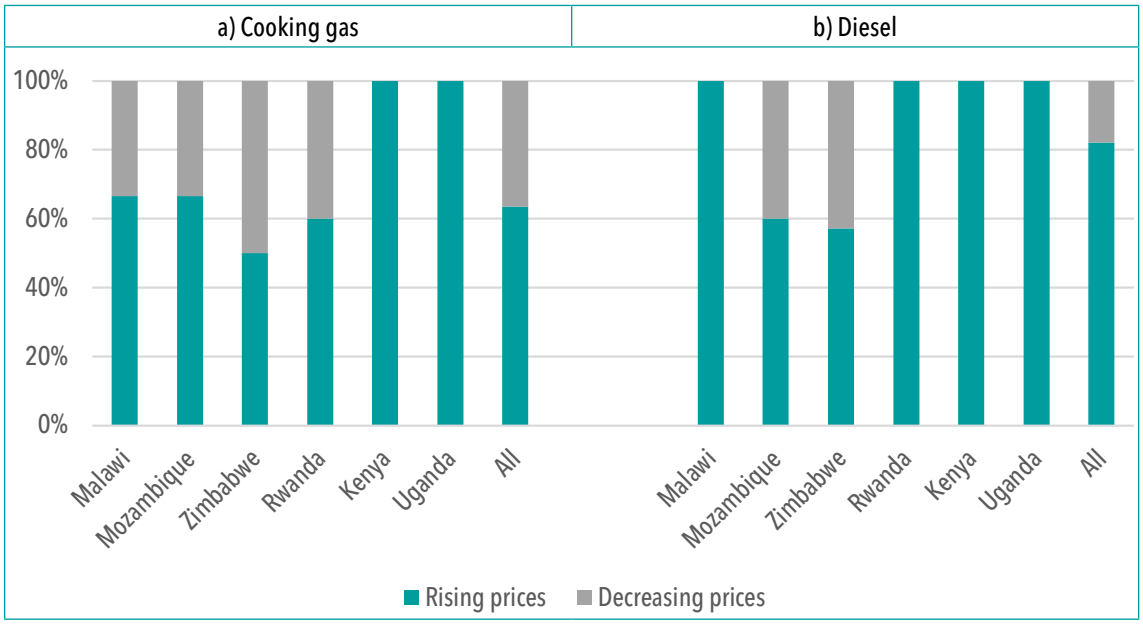
Figure 5.17 Frequency of episodes of increasing and decreasing cooking oil prices in local urban and rural markets



Source: Constructed using data from the Ministry of Agriculture, Malawi (2022); Ministry of Agriculture, Mozambique (2022); Ministry of Agriculture, Zimbabwe (2022); National Institute of Statistics and Ministry of Agriculture and Animal Resources, Rwanda (2022); Bureau of Statistics, Uganda (2022); and Ministry of Agriculture, Livestock, Fisheries, and Co-operatives, Kenya (2022).

Compared with cooking gas, which has substitutes such as wood and wind, solar, and water-based energy systems, diesel and petrol have limited ready substitutes. This may explain why diesel and petrol prices increased more often than cooking gas prices as the war created international scarcity, as shown in Figure 5.18. Some countries including Zimbabwe, Malawi, and Kenya implemented subsidy programs to limit the price increase for some commodities including fuels and cooking oils (see Matchaya 2022a, 2022c; Guthiga 2022a). These subsidy programs limited the increase in fuel prices and thus limited the negative consequences that such price increases would have had on the economies, including on employment, consumption, economic growth, poverty, and general price increases. This echoes the finding that changes in energy prices in Malawi (fuel), Mozambique (cooking gas and diesel), and Rwanda (cooking gas) were similar to changes in global energy prices during the early stages of the war, which in turn supports the deduction that the observed price changes resulted from the Russia-Ukraine crisis (also see Guthiga 2022a, 2022b, 2022c; Matchaya 2022a, 2022b, 2022c). On the other hand, changes in cooking gas prices were up to three times higher in Malawi and Zimbabwe than would have been expected over the February to May period (Badiane et al. 2022b).

Figure 5.18 Frequency of episodes of increasing and decreasing cooking gas and diesel prices in local markets



Source: Constructed using data from the Ministry of Agriculture, Malawi (2022); Ministry of Agriculture, Mozambique (2022); Ministry of Agriculture, Zimbabwe (2022); National Institute of Statistics and Ministry of Agriculture and Animal Resources, Rwanda (2022); Bureau of Statistics, Uganda (2022); and Ministry of Agriculture, Livestock, Fisheries, and Co-operatives, Kenya (2022).

The next section focuses on effects of the crisis on poverty and the cost of a healthy diet, which are long-term challenges for a large share of Africa's population.

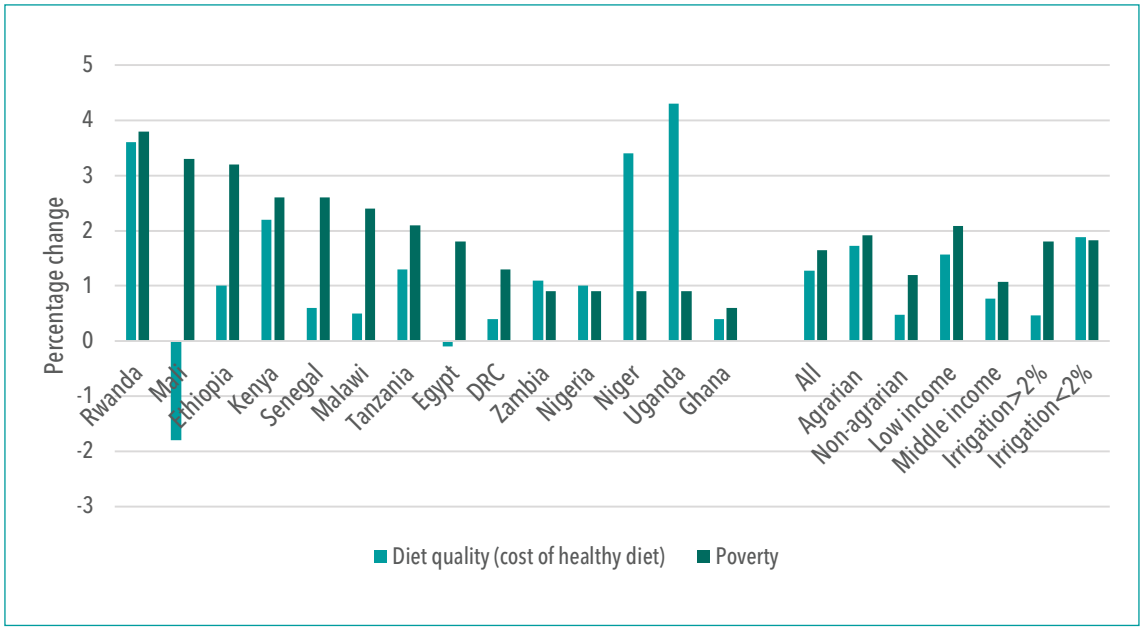
Poverty and the cost of a healthy diet

The Russia-Ukraine war has contributed to global market disruptions, which, along with other factors, have affected terms of trade and real exchange rates of other countries, with ramifications throughout their economies (Badiane, Fofana, and Sall 2022). The impacts on employment and economic growth affect household incomes and their distribution, and in turn, affect local commodity prices.

The impacts presented in Figure 5.19 and Figure 5.20 were drawn from IFPRI's Ukraine crisis briefs for each country (Diao et al. 2022a–2022i). They were calculated using simulations after implementing economywide analysis of each country using IFPRI's RIAPA model to estimate the domestic impacts of the global price shocks on all sectors, workers, and households. The RIAPA model makes it possible to capture a range of factors to measure the overall impact of the crisis for each country.

Figure 5.19 presents the impact of the global market disruptions on poverty as well as the cost of a healthy diet.[8]

Figure 5.19 Impact of the Russia-Ukraine shock on poverty and the cost of a healthy diet



Source: Author's construction with data from Abay et al. 2022; Andam et al. 2022; Badiane, Fofana, and Sall 2022a, 2022b; Breisinger et al. 2022; Diao et al. 2022a–2022j; and Chapoto et al. 2022.

Egypt experienced little change in the cost of a healthy diet during the study period. The small decline in cost was driven by the fact that increasing prices for edible oils and for wheat pushed up their costs, while falling incomes reduced demand for fruits, dairy, and protein foods, and so lowered the cost of these nutritious foods (Abay et al. 2022). The size of these price increases and decreases was generally similar, and thus they essentially cancelled each other out. For Mali, these two opposite factors led to a greater decline in real costs of a healthy diet, although this should not be interpreted as a real gain since most of the fall was due to low demand as incomes fell (Diao et al. 2022e). Uganda, Niger, and Rwanda experienced large increases in the cost of a healthy diet, which likely led to declines in consumption of high-quality foods, especially in Rwanda where poverty rates also increased significantly.

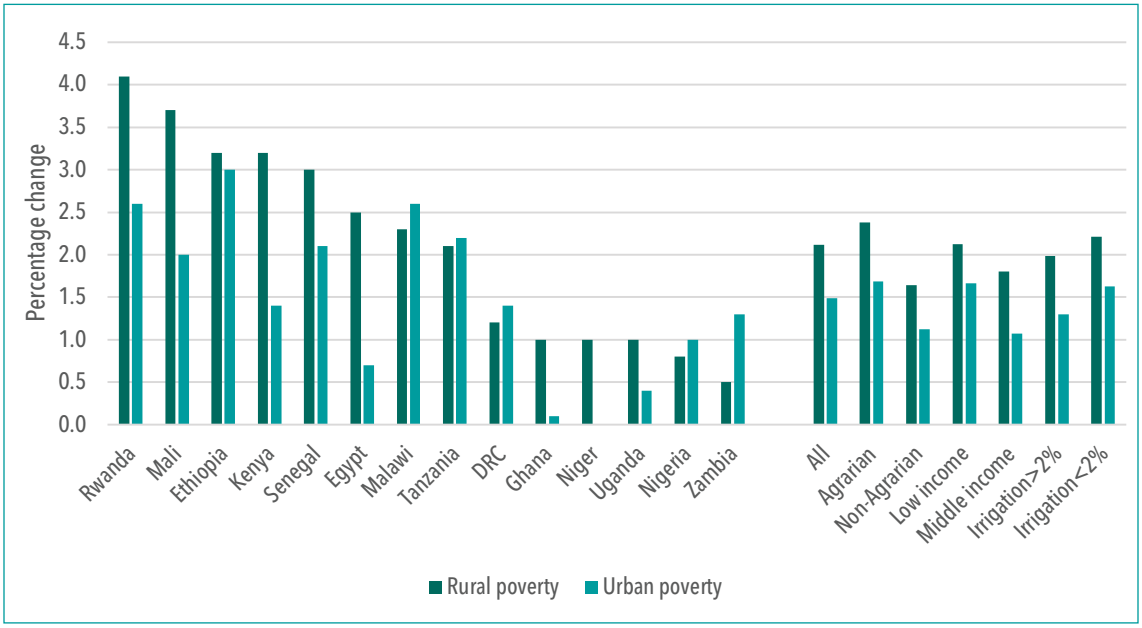
Economies that were predominantly agrarian appear to have experienced the largest increases in poverty (2 percent) and the cost of a healthy diet (1.8 percent). In contrast, economies where agriculture accounts for a smaller share of GDP experienced an increase in the cost of a healthy diet of less than 0.5 percent and poverty increases of just around 1 percent. These different effects may reflect the fact that agrarian economies tend to lack diversification of economic activities, so when there is a disruption to the agricultural market, sources of income dry up for many people. The countries with low rates of agriculture irrigation (irrigating less than 2 percent of arable land) appear to have experienced higher costs of healthy diets and greater increases in poverty, which implies that increasing irrigation might help to cushion economies from the effects of international food price spikes.

8 The cost of a "healthy" reference diet (CoRD) is tracked with six food crops as defined by the EAT-*Lancet* Commission (https://eat-forum.org/eat-lancet-commission/) (see Diao et al. 2022e). Poverty headcounts are calculated as the population that lives below the poverty line of $1.90 per day (Diao et al. 2022e).

Location and the distribution of the Russia-Ukraine shock

For appropriate policy formulation and implementation, it is often useful to understand the spatial distribution of impacts of crises. Hence, understanding any differential impacts of the global market disruptions in rural and urban areas can be useful for intervention planning and implementation. Global market disruptions affect rural and urban areas differently because the two are characterized by different population densities, incomes, and production patterns. Incomes and import dependency tend to be higher in urban centers than rural areas. In addition, rural and urban areas usually face different regimes of transaction costs to access markets. For instance, urban centers are generally well connected to commodity markets and are the landing points for imports, though they also are rarely self-sufficient and must import food from rural areas.

Figure 5.20 Impact of the Russia-Ukraine shock on rural and urban poverty



Source: The data used to construct this graph were extracted from the following briefs developed by AKADEMIYA2063 and IFPRI to provide insights into the implications of the Russia-Ukraine war on economies: Abay et al. 2022; Andam et al. 2022; Badiane, Fofana, and Sall 2022a, 2022b; Breisinger et al. 2022; Diao et al. 2022a–2022j; and Chapoto et al. 2022.

Figure 5.2 shows that the impact of the Russia-Ukraine crisis on poverty in rural areas has generally differed from the impact in urban areas. In the sample of countries, rural poverty increased by 2.1 percent, on average, while urban poverty increased by 1.5 percent over the study period. Considering the rural dependency on fertilizers for production and agriculture for jobs, it is perhaps no surprise that the crisis hit rural areas the hardest. As import prices for fertilizers and food rose and incomes generally declined, rural areas bore the brunt of the crisis.

The countries that saw the largest increases in rural poverty include Rwanda (4.1 percent), Mali (3.7 percent), Ethiopia and Kenya (3.2 percent), and Senegal (3.0 percent), while the least affected countries include Zambia (0.5 percent), Nigeria (0.8 percent), and Uganda, Niger, and Ghana, each with a rural poverty increase of just 1 percent. In contrast, urban poverty increased the most in Ethiopia (3.0 percent), Malawi and Rwanda (2.6 percent), Tanzania (2.2 percent), as well as Senegal and Mali (2.1 percent). In Egypt, gains from increasing fuel prices helped reduce urban poverty, but food prices increased in both rural and urban centers, increasing

poverty, perhaps because diesel prices are a major cost of production and food commodities are sensitive to fuel prices (Abay et al. 2022). Overall, low-income countries experienced a larger increase in rural poverty (2.1 percent) than low-middle-income counties (1.8 percent). Clearly, the Russia-Ukraine war contributed to these increases in poverty, though the impact may vary by country depending on other factors affecting the poverty impact. For example, Mozambique benefited from higher prices (Badiane, Fofana, and Sall 2022a) through the mining and energy industries, but these gains did not lead to immediate gains in employment or consumption across Mozambique because such industries are not labor intensive. Moreover, Mozambique was undergoing other internal crises, including the unrest in Cabo Delgado and massive floods. As a result, the effects of the Russia-Ukraine war made the situation worse. Similarly, in Ethiopia where a state of a civil war and a drought were occurring during the study period, rural poverty increased dramatically following the onset of the Russia-Ukraine war. These examples serve to highlight the importance of other local shocks within countries in shaping the final impacts of external crises.

Highlighted national policy responses

This section highlights the policy responses put in place in Africa to cushion the impact of the shock. The insights from the section will contribute to the policy recommendations in the conclusion of the chapter.

Trade bans: Following the onset of the war and the initial episodes of commodity price increases, various countries began responding.[9] Some African countries, including Algeria, Burkina Faso, Cameroon, Morocco, Tunisia, and Uganda, implemented trade bans on various food commodities, including sugar, vegetable oils, wheat derivatives (Algeria), millet, sorghum, maize (Burkina Faso), cereals, vegetable oils (Cameroon), tomatoes, potatoes (Morocco), as well as maize, soybeans and rice (Uganda) and fruits and vegetables (Tunisia) (World Bank 2023). Such food trade bans are likely to slow the rate of recovery of prices from the Russia-Ukraine war and should thus be avoided. These bans also tend to damage the private sector's confidence in investing in the regional trade network, especially those investments aiming to promote value addition. Indeed, one export ban at a specific stage of the value chain will disrupt all upstream and downstream activities.

Subsidies: Tanzania, Namibia, Malawi, Mozambique, Zimbabwe, and Botswana embarked on initiatives to improve food security in early 2022. Tanzania has moved to subsidize fertilizers in order to improve maize, rice, and wheat yields. It has also put in place import substitution strategies to increase domestic production of sunflowers, wheat, and palm oil and has revived the government-owned estate farms for wheat in Arusha. Similarly, Namibia moved to subsidize some commodities to reduce price increases, and embarked on agricultural productivity improvement programs under the UN Joint Programme Namibia. Under this program, Namibia intensified activities at two Green Scheme irrigation projects (Shadikongoro and Sikondo) by planting them with wheat, and further, the government planned to increase agriculture funding, reduce trade restrictions, invest in oil seeds, and subsidize other agriculture inputs (Namibia Agronomic Board 2022).

Tax reduction: Mozambique also took several steps to reduce price increases for food commodities and to enhance future agricultural production. For example, the government reduced the taxes (VAT) on agricultural inputs (seeds, pesticides, and fungicides), agricultural

9 Although the focus here is on national initiatives, some regional actions have also been triggered and are worth mentioning. These include the Africa Trade Exchange (ATEX) platform, initially designed by UNECA and Afreximbank under the AfCFTA and in the wake of the COVID-19 crisis, to procure cereals, vegetable oils, and fertilizers at a reduced cost.

machinery, and fertilizers, and together with the Mozambique Institute of Agricultural Research (IIAM), will increase wheat production in Nissa province, where wheat potential is highest. Similar efforts were also made in the livestock subsector, where subsidies targeted national feed production and national production of chicks, as well as mandatory vaccines for livestock.

Loans, interest rates, and social protection programs: Some countries, including Egypt, have launched fiscal and monetary policy instruments that include interest rate increases to curb future inflation and limit the crises' adverse effects. Egypt has also expanded its social protection programs targeting the poor, and announced a price cap on unsubsidized bread while also increasing planned wheat procurement from the domestic market through a combination of offering higher prices and other incentives to wheat farmers (Enterprise 2022). The government of Botswana introduced soft loans to support emerging and commercial farmers to produce more grains and venture into seed production. The government has also sought to provide targeted free seeds, fertilizers, and services for ploughing, harrowing, and planting to some farmers. Malawi is subsidizing cooking oils and has reduced taxes on fuel imports, and Zimbabwe put a cap on fuel prices in early 2022.

Conclusion and Recommendations

The Russia-Ukraine war has added to the disruption in already turbulent global markets. The impacts of the crisis on African countries could be substantial as a significant number of them are highly exposed, directly or indirectly, through their dependence on imports of food and fertilizers. The impact of this shock on African economies depends on the size of the shock, the overall degree of dependence of the country on imports, the share of Russia, Ukraine and Belarus in the country's imports, and on the measures put in place to mitigate the effects. Findings discussed in this chapter show that the magnitude of the shock has been significant: observed price increases have been substantial and quantity disruptions significant, especially for fertilizers and to a lesser extent for food products, particularly wheat and vegetable oils. For these two sectors, several African countries are highly exposed, raising concerns about the coming crop years and the food security situation in the continent, which is already set back by the COVID-19 pandemic. It is worth noting though that on the export side, African countries are much less dependent on Ukraine and Russia.

In a world still recovering from the pandemic, climatic and geopolitical shocks have put substantial pressure on global markets, countries, and households. Unfortunately, policy responses from key players in agricultural and fertilizer trade added to the problem, reducing supply and increasing prices and volatility. Indeed, beggar-thy-neighbor policies put in place by major food and fertilizer exporters through various trade restriction measures have contributed to keeping additional pressure on markets and threatening food security in least developed countries. The restrictions imposed are of the same magnitude as those in force during the 2008 food crisis, suggesting that no lesson was learned from that experience, and that countries that are small and net importers remain exposed because of the lack of cooperation on global markets. As the war continues and to prevent future crisis, several short-term and long-term options and policy recommendations are worth mentioning here for both African countries and the international community.

In the short to medium term, establishing social safety net programs can be one way of building the resilience of vulnerable households in the current circumstances (see Badiane, Fofana, and Sall 2022b). Smallholders facing fertilizer shortages should be identified and given safety nets to compensate for expected production losses. Where possible, governments should work with

other stakeholders to ensure that some of the most affected commodities receive subsidies or tax reductions to limit the extent to which prices rise during global market disruptions. However, fertilizer subsidies should be temporary and targeted and should not compete with private sector distribution. In the long run, domestic fertilizers should be produced on the continent to minimize fertilizer import dependency. In addition, scaling up extension services to optimize fertilizer use through the 4R approach (right source, right rate, right time, right place) is paramount.

On the international trade side, three measures could be taken in the short run. First, export restrictions should be removed to the extent possible. Second, the consultation and notification process at WTO should be improved to ensure timely and transparent notifications of restrictions. Unfortunately, countries barely notify the trade restriction measures they put in place and when they do so, it is not done on a timely basis.[10] Moreover, when markets panic, other countries tend to follow the lead of those imposing restrictions. In the medium term, exemptions on export restrictions should be extended to all least developed countries and insular economies. At the WTO level, an operational definition of a critical food shortage situation should be developed that could justify implementing an export-restricting measure. At the regional level, the African Continental Free Trade Area (AfCFTA) Agreement represents a timely opportunity to increase intra-African trade and mitigate the negative impacts of a global crisis. Studies have showed that when fully implemented, the agreement can significantly reduce the negative effects of global trade tensions and even represent an opportunity for some countries (Bouet et al. 2019). In this context, African countries should limit to the maximum extent possible the use of export restrictions among AfCFTA members.

In the long run, economic diversification is key. First, African countries should try to diversify their import sources as much as possible by developing existing African potential based on the opportunities provided by the continent's natural endowments and the use of new, and greener, technologies. For fertilizers, although the high concentration of the market for phosphates and potash makes it difficult, there are opportunities to be seized for nitrogenous fertilizers. The new production capacities coming in Nigeria could fill a significant gap for West Africa and beyond. For potash, things are more challenging in the near future although some deposits are present in the DRC, Ethiopia, and Republic of Congo.

More broadly, countries must endeavor to develop broad-based economies where agriculture, agri-business, manufacturing, mining, and other sectors contribute significantly to total GDP. In countries where it is clear that some sectors are being impacted negatively while others are gaining from the crisis, efforts should be made to improve income redistribution from winners to losers to minimize impacts for households that depend on the sectors that are directly hit. At the same time, to increase chances of adapting to the impacts of the crisis, countries that have suffered heavy foreign exchange and GDP losses should explore debt restructuring programs as well as debt cancellation opportunities with their creditors to avoid being caught up in deeper financial crises as unpaid debt interest accumulates.

10 Only 14 percent of the restriction measures put in place since the beginning of the war were notified to the WTO (WTO 2023).

References

Abay, K.A., F. Abdelradi, C. Breisinger, X. Diao, P. Dorosh, K. Pauw, J. Randriamamonjy, M. Raouf, and J. Thurlow. 2022. *Egypt: Impacts of the Ukraine and Global Crises on Poverty and Food Security.* Global Crisis Country Series, Country Brief 18. Washington, DC: International Food Policy Research Institute (IFPRI).

Andam, K., X. Diao, P. Dorosh, A. Pradesha, and J. Thurlow. 2022. *Nigeria: Impacts of the Ukraine and Global Crisis on Food Systems and Poverty.* Global Crisis Country Series, Country Brief 4. Washington, DC: IFPRI.

Badiane, O., I. Fofana, and L.M. Sall. 2022a. *Poverty and Food Security Effects among Selected African Countries.* AKADEMIYA2063 Ukraine Crisis Brief Series, No. 006. Kigali: AKADEMIYA2063.

Badiane, O., I. Fofana, and L.M. Sall. 2022b. *Impacts on Trade, Growth, Poverty, Employment, and Food Security: Summary of Findings and Policy Implications.* AKADEMIYA2063 Ukraine Crisis Brief Series, No. 12. Kigali: AKADEMIYA2063.

Badiane, O., I. Fofana, L.M. Sall, and B. Ceesay. 2022c. *Contagion and Exposure of African Countries to Global Wheat Trade Disruptions*. Ukraine Crisis Brief Series No. 001, AKADEMIYA2063, Kigali.

Badiane, O., I. Fofana, L. M. Sall, and W. Tefara. 2022d. *Contagion and Exposure of African Countries to Global Fertilizer Trade Disruptions*. Ukraine Crisis Brief Series No. 008, Akademiya2063, Kigali.

Bouet, A., D. Laborde, and F. Traore. 2019. "A Global Trading System in Turmoil: What Is at Stake for Africa?" In *Africa Agriculture Trade Monitor Report 2019*, eds. A. Bouët and S. Odjo, 109–130. Washington, DC: IFPRI.

Breisinger, C, X. Diao, P. Dorosh, J. Mbuthia, L. Omune, E.O. Oseko, A. Pradesha, J. Smart, and J. Thurlow. 2022. *Kenya: Impacts of the Ukraine and Global Crisis on Poverty and Food Security.* Global Crisis Country Series, Country Brief 1. Washington, DC: IFPRI.

Chapoto, A., X. Diao, P. Dorosh, M. Ellis, K. Pauw, J. Smart, M. Subakanya, and J. Thurlow. 2022. *Zambia: Impacts of the Ukraine and Global Crises on Poverty and Food Security*. Global Crisis Country Series, Country Brief 15. Washington, DC: IFPRI.

Diao, X., P. Dorosh, K.Pauw, J. Randriamamonjy, J. Thurlow, and J. Ulimwengu. 2022a. *Congo: Impacts of the Ukraine and Global Crises on Poverty and Food Security.* Global Crisis Country Series, Country Brief 17. Washington, DC: IFPRI.

Diao. X., P. Dorosh, M.K. Jemal, J. Smart, A.S. Taffesse, and J. Thurlow. 2022b. *Ethiopia: Impacts of the Ukraine and Global Crises on Poverty and Food Security.* Global Crisis Country Series, Country Brief 2. Washington, DC: IFPRI.

Diao, X., P. Dorosh, K. Pauw, J. Smart, J. Thurlow, S. Asante, and P. Pati. 2022c. *Ghana: Impacts of the Ukraine and Global Crises on Poverty and Food Security*. Global Crisis Country Series, Country Brief 9. Washington, DC: IFPRI.

Diao, X., P. Dorosh, J. Duchoslav, K. Pauw, J. Smart, and J. Thurlow. 2022d. *Malawi: Impacts of the Ukraine and Global Crises on Poverty and Food Security.* Global Crisis Country Series, Country Brief 10. Washington, DC: IFPRI.

Diao, X., P. Dorosh, J. Randriamamonjy, J. Smart, and J. Thurlow. 2022e. *Mali: Impacts of the Ukraine and Global Crises on Poverty and Food Security.* Global Crisis Country Series, Country Brief 7. Washington, DC: IFPRI.

Diao, X., P. Dorosh, J. Randriamamonjy, and J. Thurlow. 2022f. *Niger: Impacts of the Ukraine and Global Crisis on Food Systems and Poverty.* Global Crisis Country Series, Country Brief 6. Washington, DC: IFPRI.

Diao, X., P. Dorosh, J. Thurlow, D. Spielman, G. Benimana, S. Mugabo, and G. Rosenbach. 2022g. *Rwanda: Impacts of the Ukraine and Global Crisis on Food Systems and Poverty.* Global Crisis Country Series, Country Brief 5. Washington, DC: IFPRI.

Diao, X., P. Dorosh, J. Randriamamonjy, J. Smart, J. Thurlow. 2022h. *Senegal: Impacts of the Ukraine and Global Crisis on Food Systems and Poverty.* Global Crisis Country Series, Country Brief 8. Washington, DC: IFPRI.

Diao, X., P. Dorosh, M. Ellis, K. Pauw, and J. Thurlow. 2022i. *Tanzania: Impacts of the Ukraine and Global Crisis on Food Systems and Poverty.* Global Crisis Country Series, Country Brief 11. Washington, DC: IFPRI.

Diao, X., P. Dorosh, M. Ellis, K. Pauw, J. Smart, and J. Thurlow. 2022j. *Uganda: Impacts of the Ukraine and Global Crises on Poverty and Food Security.* Global Crisis Country Series, Country Brief 12. Washington, DC: IFPRI.

Enterprise. 2022. "Carrots + Sticks for Local Wheat Farmers to Up Supply." *Enterprise*, March 17.

Laborde Debucquet, D., and A. Mamun. 2022. "Documentation for Food and Fertilizers Export Restriction Tracker: Tracking Export Policy Responses Affecting Global Food Markets during Crisis." Food and Fertilizer Trade Policy Tracker Working Paper 2. IFPRI, Washington, DC.

Glauber, J., and D. Laborde. 2022. *How Russia's Invasion of Ukraine Is Affecting Global Agricultural Markets*. Washington, DC: American Enterprise Institute).

Glauber, J., D. Laborde, and A. Mamun. 2022. "The Impact of the Ukraine Crisis on the Global Vegetable Oil Market." *IFPRI Blog,* May 3.

Glauber, J., D. Laborde, and A. Mamun. 2023. "Food Export Restrictions Have Eased as the Russia-Ukraine war Continues, but Concerns Remain for Key Commodities." *IFPRI Blog*, January 23.

Guthiga, P. 2022a. *The Russia-Ukraine Conflict: Impacts on Commodity Markets in Kenya.* AKADEMIYA2063 Ukraine Crisis Brief Series, No. 18. Kigali, Rwanda: AKADEMIYA2063.

Guthiga, P. 2022b. *Impacts of the Ukraine -Russia Crisis on Commodity Prices in Local Markets in Rwanda.* AKADEMIYA2063 Ukraine Crisis Brief Series, No. 13. Kigali, Rwanda: AKADEMIYA2063.

Guthiga, P. 2022c. *The Russia-Ukraine Conflict: Impacts on Commodity Markets in Uganda.* AKADEMIYA2063 Ukraine Crisis Brief Series, No. 19. Kigali: AKADEMIYA2063.

Hebebrand, C., and D. Laborde. 2022. "High Fertilizer Prices Contribute to Rising Global Food Security Concerns." *IFPRI Blog*, April 25.

Matchaya, G., 2022a. *The Russia-Ukraine Conflict: Impacts on Commodity Markets in Malawi*. AKADEMIYA 2063 Ukraine Crisis Brief Series, No. 10. Kigali: AKADEMIYA2063.

Matchaya, G., 2022b. *The Russia-Ukraine Conflict: Impacts on Commodity Markets in Mozambique*. AKADEMIYA2063 Ukraine Crisis Brief Series, No. 15. Kigali: AKADEMIYA2063.

Matchaya, G., 2022c. *The Russia-Ukraine Conflict: Impacts on Commodity Markets in Zimbabwe*. AKADEMIYA2063 Ukraine Crisis Brief Series, No. 16. Kigali: AKADEMIYA2063.

Namibia Agronomic Board. 2022. *The Impact of the Russia-Ukraine War on Namibia's Crop Industry*. Policy Brief No:03. Windhoek: Namibian Agronomic Board.

World Bank. 2023. *Food Security Update*. Washington, DC: World Bank.

World Bank. 2022. Commodity Price Data (The Pink Sheet). https://www.worldbank.org/en/research/commodity-markets

WFP (World Food Programme). 2022. *Implications of the Conflict in Ukraine on Food Access and Availability in the East Africa Region - Update #3*. Rome.

WTO (World Trade Organization). 2023. *A Year of Turbulence on Food and Fertilizers Markets*. Trade Monitoring Updates. Washington, DC.

CHAPTER
SIX

Agricultural Trade and Trade Integration in the East African Community

Antoine Bouët
and Nicodème Nimenya

Introduction

The East African Community (EAC) is a regional intergovernmental organization of seven partner states, comprising Burundi, Democratic Republic of the Congo (DRC), Kenya, Rwanda, South Sudan, Tanzania, and Uganda, with its headquarters in Arusha, Tanzania. Like other regional trade agreements (RTAs), the EAC pursues economic and political objectives through regional integration.

As Eken (1979) explains, there are two main justifications for regional integration, especially for developing countries. First, for economic reasons, regional integration may provide an important instrument of economic growth. Removing barriers to the free movement of goods, labor, and capital between countries leads to the expansion of trade, and therefore of incomes and employment. Large economic entities with their larger markets (people and space) should permit economies of scale in production, leading to an efficient allocation of resources (capital and labor) and attracting substantial foreign direct investment. Second, for political purposes, establishing regional economic communities (RECs) strengthens collective self-reliance and is therefore expected to reinforce the political independence of groups of countries and enlarge their economic and political role in international relations, a point especially important for developing countries.

This chapter addresses five main issues concerning the EAC. It first presents the EAC's origin and main achievements, and then highlights the EAC's agricultural trade performance relative to other RECs in Africa by comparing agricultural trade indicators, assessing the composition of trade, and identifying the main destinations/origins of agricultural exports/imports across RECs. This section also compares the level of trade integration in the EAC to that of other African RECs to determine its main agricultural comparative advantages. The same analysis is then repeated at the country level. The following section assesses the magnitude of formal (registered) and informal cross-border agricultural trade within the EAC, discusses the factors of trade integration, and highlights the role of tariff and nontariff measures (NTMs), logistic performance, and exchange rates. The final section offers conclusions.

Origins and Main Achievements of the EAC

The EAC's initial membership comprised Kenya, Tanzania, and Uganda. These countries have enjoyed a long history of cooperation under successive regional arrangements, including: (1) the Customs Union between Kenya and Uganda in 1917, later joined by Tanganyika (currently known as Tanzania) in 1927; (2) the East African High Commission (1948–1961); (3) the East African Common Services Organisation (1961–1967); (4) the East African Community (1967–1977); and (5) the East African Cooperation (1993–2000).

First established in 1967, the EAC was dissolved in 1977 due to Kenya's request for more seats in decision-making bodies, disagreements between members, and ideological gaps between Kenya and Tanzania.[1] It was reestablished in July 2000 by the original three member states. Before the treaty for reestablishment was signed on November 30, 1999, and entered into force on July 7, 2000, the agreement for the Establishment of the Permanent Tripartite Commission for East African Cooperation was signed on November 30, 1993, and launched on March 14, 1996. It stated that any foreign country could apply to join, participate in, or be associated with the community (Kaahwa 2003).

1The failure to implement the Kampala Agreement of 1964, which provided quotas for intra-EAC trade to limit trade imbalances, led to the imposition of quantitative restrictions by Uganda and Tanzania (Eken 1979). This weakened the effectiveness of the Common Market and led to dissolution of the Common Monetary Area. Other disagreements among the three countries arose over the distribution of benefits, while some were based on ideological differences between Tanzania (which was establishing its policy of socialism and self-reliance) and Kenya (which was promoting private and foreign investment) (Eken 1979).

On June 18, 2007, the Republics of Burundi and Rwanda acceded to the EAC treaty. The Republic of South Sudan acceded on April 15, 2016. More recently, the DRC acceded on April 8, 2022.

The EAC covers a physical area of 4.8 million square kilometers including water, serving a total population estimated at 295 million people in 2021. The EAC's gross domestic product (GDP) at current market prices was estimated at US$299.9 billion in 2021. Table 6.1 shows the region's socioeconomic variables by country (EAC 1999–2022).

Table 6.1 Key socioeconomic variables across countries in the EAC, 2021

Country	Area (sq. km)	Population (millions)	GDP (US$ billions, current prices)	GDP/capita (US$, constant prices)
Burundi	27,834	12.55	2.78	261.02
DRC	2,345,410	95.89	55.35	501.24
Kenya	582,846	53.00	110.35	1,705.00
Rwanda	26,338	13.46	11.07	890.19
Uganda	241,038	45.85	40.53	920.55
South Sudan	644,327	10.75	12.00*	364.00
Tanzania	945,087	63.59	67.84	1,039.60
EAC	4,812,880	295.10	299.91	

Source: World Development Indicators database (World Bank) and Perspective Monde (Sherbrooke University).
Note: * indicates data from 2015.

In terms of regional integration commitments, the EAC has already implemented all stages except the monetary union requirements, which are still in progress,[2] as well as the political federation. According to Article 5(2) of the treaty establishing the EAC, the first stage of integration was the customs union, skipping the earlier stages of preferential trade area (PTA) and free trade area (FTA). The customs union came into force in January 2005 with four requirements: (1) creation of a common external tariff (CET); (2) establishment of the EAC Rules of Origin (RoO) criteria, including certificates of origin and simplified certificates of origin;[3] (3) internal elimination of tariffs for goods meeting the EAC's RoO criteria; and (4) elimination of nontariff barriers (NTBs). The protocol for establishment of the EAC Common Market was signed on November 20, 2009; the protocol for establishment of the EAC Monetary Union was signed on November 30, 2013.[4]

Furthermore, the EAC committed to form a Tripartite Free Trade Area (TFTA) with the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC) to facilitate free trade (Mutambara and Bhebhe 2019); according to analysts, the EAC is engaging on numerous fronts (Makame 2012). The TFTA was initiated in October 2008 and launched in June 2015 (Mutambara and Bhebhe 2019) to address inconsistencies

2 The EAC Monetary Affairs Committee (MAC) met in March 2023 in Bujumbura (Burundi), where the Governors of the Central Banks signed the Addendum of the Memorandum of Understanding on currency convertibility, an important achievement in enhancing transactions across the region per implementation of the Protocol of Monetary Union.
3 RoOs are not necessary in a fully implemented customs union or when the payment of border taxes is processed when a good enters the customs union. However, they are needed in a customs union when the payment of border taxes is processed when a good enters the destination country.
4 The Treaty provides that the customs union shall be followed first by a Common Market, then by a Monetary Union, and subsequently by a Political Federation.

stemming from the confusing combination of overlapping and sometimes incompatible preferential trade regimes due to countries' membership in other RECs (Willenbockel 2014).[5]

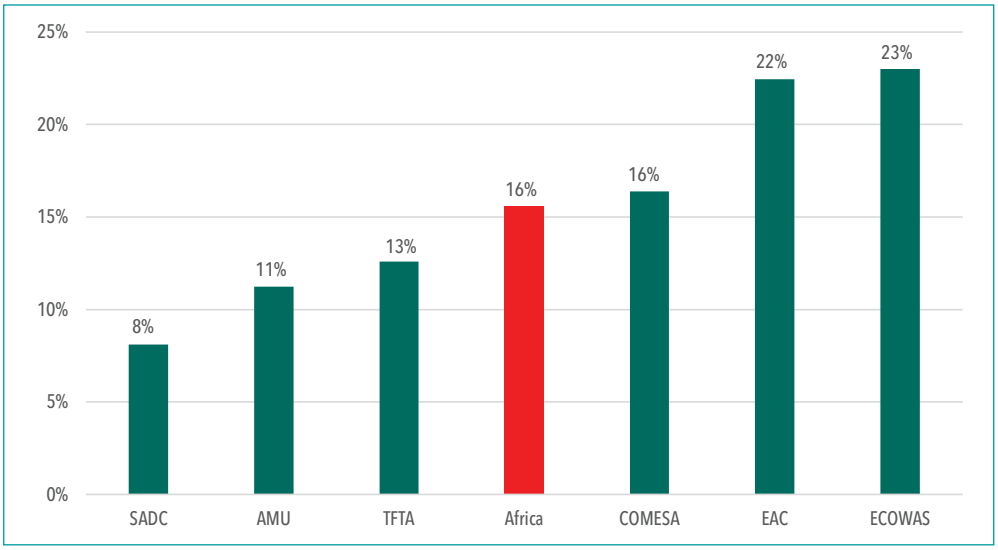
Despite the progress in regional integration implementation, some challenges related to the EAC Common Market still need to be addressed. Basnett (2013) examines how the EAC's common (labor) market protocol promotes free labor movement. He finds that the EAC's work-permit regime is in conflict with the free movement of workers; instead, it reinforces existing immigration rules and regulations. Furthermore, Basnett notes the lack of regional preference, a biased implementation of the work-permit regime, and a lack of mutual recognition of workers' qualifications, all of which limit the advantages of the EAC Common (labor) Market. A study conducted by Samuel Hall, Maastricht University, and the University of Oxford (2017) finds that the Common Market Protocol only applies to the formal labor market, which represents less than 20 percent of employment in the EAC. Migration flows in the EAC are often irregular, and the region is characterized by significant refugee flows. To address these issues of weak labor movement in the EAC, country members are encouraged to: (1) harmonize labor las; (2) enhance the use of information and communication technology in the collection, analysis, and dissemination of labor market information, data, and statistics on migrants; and (3) improve the provision of necessary consular assistance and protection of the social, economic, labor, and human rights of EAC migrant workers. These issues may be addressed in the negotiations currently underway on mutual recognition of qualifications in various professions.

The EAC Compared to Other RECs

We first construct trade indicators by REC and compare those of the EAC with five other RTAs on the African continent: the Arab Maghreb Union (AMU),[6] ECOWAS, COMESA, SADC, and TFTA.

shows the share of agriculture in GDP for the six RECs. It also shows this statistic for all of Africa as a benchmark.

Figure 6.1 Share of agriculture in GDP, 2019–2021 (average)



Source: World Development Indicators; accessed February 15, 2023.

Note: The bars represent the ratio of value added in agriculture, forestry, and fishing in current US$ over GDP in current US$.

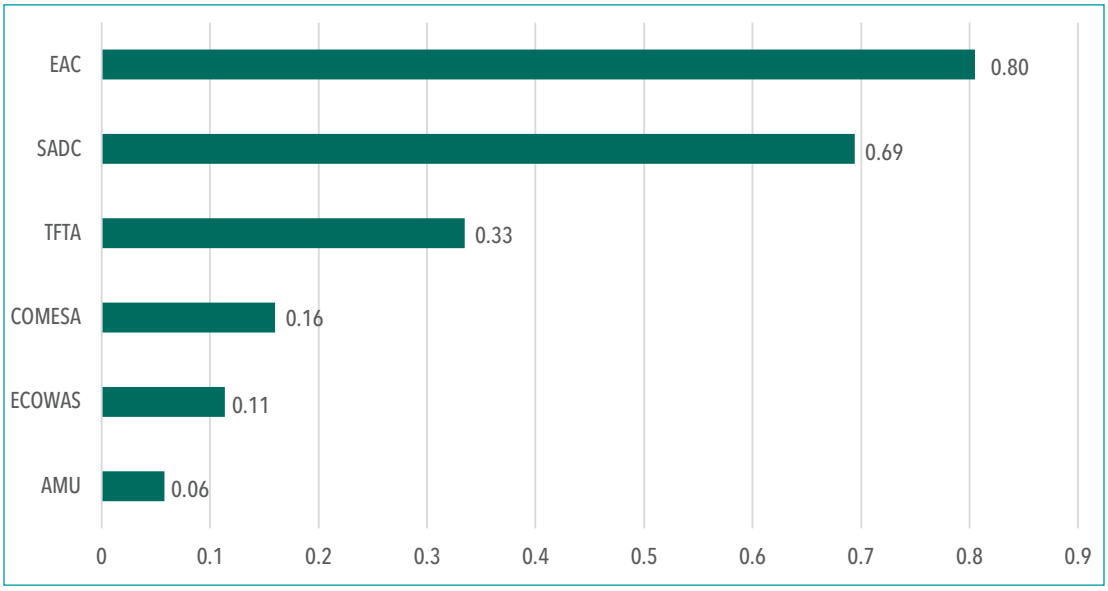
5 The TFTA is not in force yet. To enter into force, the TFTA requires a minimum of 14 ratifications by member states. The TFTA comprises 27 countries: Angola, Botswana, Burundi, Comoros, Djibouti, DRC, Egypt, Eritrea, Eswatini, Ethiopia, Kenya, Lesotho, Libya, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Seychelles, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, and Zimbabwe. By the end of 2021, 11 countries had ratified the TFTA.

6 The AMU is an economic and political organization bringing together Algeria, Libya, Morocco, Tunisia, and Mauritania, with the aim of promoting the free movement of goods. Although this objective has not yet been achieved, we consider it to be a trade agreement.

Agricultural activity is important in Africa, accounting for more than 15 percent of total economic activity. In ECOWAS and the EAC, agriculture is particularly important relative to the continental benchmark, and less important in TFTA, AMU, and especially SADC, where it represents only 8.1 percent of total economic activity.

The intensity of intraregional agricultural trade is another informative measure, often captured by the share of intraregional trade in total trade. While interesting for a region over time, this indicator does not allow for a comparison of several RECs in terms of trade integration on a given date. Indeed, this indicator varies with the economic weight of each member country and the number of member countries. As such, it reflects not only the degree of integration of a REC, but also factors related to economic activity and geography. A better indicator is the Regional Trade Introversion Index. When benchmarking the share of regional trade in total trade, this index takes the rest of the world as a reference, not the whole world, which removes the bias associated with RECs of different sizes. This indicator is symmetric around 0, is independent of the size of the region, and increases only if intraregional (agricultural) trade grows faster than extraregional trade. A positive statistic indicates that the region is more trade-introverted than trade-extraverted. shows this indicator for the six RECs, wherein trade flows are averaged over the period 2016–2021. The EAC is clearly the most trade-introverted of the six RECs.

Figure 6.2 Regional Trade Introversion Index by REC, 2016–2021 (average)



Source: 2023 AATM database and authors' calculations.

Table 6.2 shows the top 10 agricultural products (at the 6-digit Harmonized System level) exported by each of the six RECs.

Table 6.2 Top 10 agricultural exports and their share in total agricultural trade by REC, 2019–2021 (average)

AMU		COMESA		EAC	
Description	Share	Description	Share	Description	Share
Tomatoes	15.4%	Coffee, not roasted or decaff.	8.2%	Tea, black	21.0%
Olive oil	9.8%	Tobacco, semiprocessed	7.1%	Coffee, not roasted or decaff.	15.4%
Mandarins	7.1%	Tea, black	5.8%	Flowers, cut; flowers and buds	10.4%
Raspberries, blackberries	5.6%	Sesamum seeds	4.8%	Cashew nuts	4.4%
Dates	4.8%	Oranges	4.5%	Tobacco, semiprocessed	3.6%
Sucrose, chemically pure	4.8%	Flowers, cut; flowers and buds	4.1%	Sesamum seeds	3.3%
Beans	4.1%	Vanilla	3.3%	Avocados	3.1%
Cranberries, bilberries, and other	3.9%	Olive oil	3.0%	Cocoa beans, unprocessed	2.6%
Fruits, genus capsicum, or pimenta	2.8%	Groundnuts, unprocessed	1.8%	Beans	1.9%
Watermelons, fresh	2.4%	Cotton, not carded or combed	1.7%	Plants, live; unrooted	1.8%
ECOWAS		**SADC**		**TFTA**	
Description	Share	Description	Share	Description	Share
Cocoa beans, unprocessed	37.8%	Tobacco, semiprocessed	12.0%	Oranges	6.8%
Cashew nuts	12.6%	Oranges	7.2%	Tobacco, semiprocessed	6.4%
Cotton, unprocessed	8.8%	Grapes, fresh	6.1%	Coffee, not roasted or decaff.	6.3%
Cocoa, paste	7.6%	Vanilla	4.2%	Sesamum seeds	4.4%
Sesamum seeds	5.8%	Cane sugar, raw	3.6%	Tea, black	4.1%
Cocoa, butter	5.2%	Mandarins	3.1%	Grapes, fresh	4.1%
Bananas	2.4%	Lemons	2.9%	Flowers, cut; flowers and buds	2.9%
Cocoa, defatted paste	1.8%	Wine	2.8%	Vanilla	2.3%
Groundnuts, unprocessed	1.7%	Apples	2.7%	Mandarins	2.0%
Soya beans, unprocessed	1.5%	Maize (corn)	2.4%	Lemons	1.8%

Source: 2023 AATM database and authors' calculations.

Five of the six communities (AMU is not included in this group) mostly export Africa's traditional export products: coffee, cocoa, tea, tobacco, and cotton. Two RECs have a high concentration of exports in three products: black tea, unroasted coffee, and cut flowers account for nearly 47 percent of the EAC's agricultural exports; unprocessed cocoa beans, cashew nuts, and unprocessed cotton account for more than 59 percent of ECOWAS's agricultural exports. Among these top 10 exported agricultural products, unprocessed products predominate, especially in ECOWAS.

Table 6.3 shows the top 10 products (at the 6-digit Harmonized System level) imported by each of the six RECs.

Table 6.3 Top 10 agricultural imports and their share in total agricultural trade by REC, 2019–2021 (average)

AMU		COMESA		EAC	
Description	Share	Description	Share	Description	Share
Wheat and meslin	14.9%	Wheat and meslin	13.9%	Wheat and meslin	18.0%
Maize (corn)	8.0%	Wheat and meslin. durum wheat	9.1%	Palm oil, crude	14.7%
Cane sugar, raw	6.0%	Maize (corn)	7.3%	Palm oil, other than crude	7.9%
Soya bean oil	5.4%	Palm oil. other than crude	5.2%	Rice, semimilled or wholly milled	6.8%
Wheat and meslin, durum wheat	4.3%	Rice, semimilled or wholly milled	4.2%	Sucrose, chemically pure	6.1%
Milk and cream, concentrated	4.2%	Soya beans	4.2%	Food preparations; n.e.c.	2.9%
Cigarettes	3.6%	Sucrose, chemically pure	3.9%	Cane sugar, raw	2.8%
Cereals; barley, other than seed	2.9%	Cigarettes	3.3%	Meat and edible offal of fowls, frozen	1.3%
Oilcake and other solid residues	2.8%	Meat; of bovines, boneless cuts, frozen	2.9%	Nonalcoholic beverages	1.3%
Soya beans	2.5%	Palm oil, crude	2.6%	Meat and edible offal of fowls, not cut, frozen	1.3%
ECOWAS		**SADC**		**TFTA**	
Description	Share	Description	Share	Description	Share
Wheat and meslin	11.8%	Rice, semimilled or wholly milled	10.7%	Wheat and meslin	14.2%
Rice, semimilled or wholly milled	11.5%	Wheat and meslin	9.2%	Wheat and meslin, durum wheat	8.0%
Wheat and meslin, durum wheat	7.1%	Palm oil, other than crude	8.7%	Palm oil, other than crude	6.7%
Rice, broken	5.2%	Meat and edible offal of fowls, frozen	4.2%	Cereals; maize (corn), other than seed	5.7%
Food preparations; of flour	4.6%	Food preparations, n.e.c.	2.5%	Rice, semimilled or wholly milled	5.5%
Palm oil, other than crude	4.5%	Sucrose, chemically pure	2.2%	Sucrose, chemically pure	3.2%
Cane sugar, raw	3.6%	Palm oil, crude	2.1%	Soya beans	3.2%
Sucrose, chemically pure	3.2%	Meat and edible offal of fowls, not cut, frozen	1.9%	Meat of bovines, boneless cuts, frozen	2.7%
Food preparations, n.e.c.	2.7%	Wheat and meslin, durum wheat	1.8%	Palm oil, crude	2.7%
Milk and cream, concentrated	2.5%	Oilcake and other solid residues	1.5%	Food preparations; n.e.c.	1.9%

Source: 2023 AATM database and authors' calculations.

Note: n.e.c. = not elsewhere classified; decaff. = decaffeinated.

Three of the four major cereals (wheat, maize, rice) are the main products imported in all six RECs. These three cereals account for almost 35 percent of agricultural imports for COMESA and ECOWAS, and 30–35 percent for TFTA and AMU. The share is lower for the EAC at about 25 percent, and even lower for SADC (slightly above 20 percent). Two other African products that are significantly imported in all six regions are vegetable oils and sucrose, both high-calorie food products. The EAC is no exception: palm oil accounts for 22.6 percent of its agricultural imports and sucrose and cane sugar for almost 9 percent.

Table 6.4 indicates the top 10 destinations of each REC's agricultural exports, where it is clear that large proportions of agricultural exports are directed to Europe. This is particularly the case for AMU: more than 57 percent of its agricultural exports go to Europe, with 40 percent to France and Spain. This share is 20–30 percent for the other RECs, with ECOWAS close to 30 percent, COMESA close to 20 percent, and the EAC at 23 percent.[7] China is becoming a key destination for African agricultural products, except for those of AMU. Asia is an important destination for the EAC's agricultural products: Pakistan, India, China, and Viet Nam account for one-quarter of its exports. The Netherlands is frequently listed, but its importance as a destination for African agricultural products is overestimated as it is a major reexporting center.

The destinations of African agricultural exports are likely explained by preferences given through nonreciprocal trade preferences (like the Everything But Arms agreement of the European Union and the African Opportunity Act of the United States), by the GDP of importing countries, and by geographic distance and history (for example, colonial links; see Head, Mayer, and Ries 2011).

Table 6.4 Top 10 destinations of agricultural exports and their share in total agricultural trade by REC, 2019–2021 (average)

AMU		COMESA		EAC	
Destination	Share	Destination	Share	Destination	Share
France	20.5%	China	9.0%	Netherlands	10.6%
Spain	19.4%	Saudi Arabia	7.1%	Pakistan	9.6%
Germany	7.4%	US	6.6%	India	7.9%
US	6.6%	Netherlands	5.9%	UK	6.8%
Italy	5.4%	Germany	5.4%	Germany	5.5%
UK	4.9%	UK	4.2%	US	4.5%
Netherlands	4.5%	UAE	4.0%	UAE	4.0%
Russian Fed.	3.7%	France	3.8%	China	3.7%
Canada	2.6%	India	3.6%	Viet Nam	3.7%
Small countries	2.2%	Russian Fed.	3.4%	Egypt	3.4%
ECOWAS		**SADC**		**TFTA**	
Destination	Share	Destination	Share	Destination	Share
Netherlands	14.9%	China	10.7%	China	9.8%
Viet Nam	8.8%	Netherlands	8.5%	Netherlands	8.1%
US	7.8%	UK	7.3%	UK	6.4%
India	7.7%	Germany	6.6%	Germany	6.1%
China	7.5%	US	6.3%	Saudi Arabia	5.7%
France	7.0%	India	5.8%	US	5.6%
Germany	4.9%	UAE	3.5%	India	5.0%
Malaysia	4.4%	France	3.2%	UAE	4.2%
UK	3.0%	Russian Fed.	3.2%	Russian Fed.	3.6%
Türkiye	3.0%	Kenya	2.7%	France	2.7%

Source: 2023 AATM database and authors' calculations.
Note: UAE = United Arab Emirates; UK = United Kingdom; US = United States; Fed. = Federation. "Small countries" is an aggregation of non-African small economies and undesignated zones not explicitly specified in the database.

7 Note the overlap of EAC and COMESA: all EAC countries also belong to COMESA.

Table 6.5 shows the top 10 origins of agricultural imports for the six RECs.

Table 6.5 Top 10 origins of agricultural imports and their share in total agricultural trade by REC, 2019–2021 (average)

AMU		COMESA		EAC	
Origin	Share	Origin	Share	Origin	Share
France	11.4%	Russian Fed.	11.2%	Indonesia	13.2%
Brazil	10.6%	India	8.5%	Malaysia	9.5%
Argentina	10.1%	Ukraine	7.9%	Russian Fed.	7.4%
Spain	6.2%	US	7.2%	Zambia	6.0%
Ukraine	5.2%	Brazil	6.3%	India	5.3%
US	4.8%	UAE	5.1%	Pakistan	3.8%
Canada	4.2%	Indonesia	4.9%	Argentina	3.7%
Germany	3.5%	Argentina	4.4%	South Africa	3.5%
Türkiye	3.3%	Türkiye	4.0%	US	3.3%
UAE	3.0%	South Africa	3.8%	Egypt	2.7%
ECOWAS		**SADC**		**TFTA**	
Origin	Share	Origin	Share	Origin	Share
India	9.0%	Malaysia	6.9%	Russian Fed.	10.8%
Brazil	7.8%	Brazil	6.6%	India	7.8%
France	6.7%	India	5.9%	US	7.2%
China	6.4%	Thailand	5.9%	Brazil	6.7%
US	6.0%	Indonesia	5.6%	Ukraine	6.4%
Russian Fed.	4.8%	Argentina	4.9%	Indonesia	5.9%
Malaysia	4.7%	US	4.7%	Argentina	4.9%
Netherlands	4.6%	France	4.5%	Malaysia	4.7%
Viet Nam	3.5%	China	3.7%	Türkiye	3.7%
Germany	3.0%	Netherlands	3.6%	UAE	3.2%

Source: 2023 AATM database and authors' calculations.

Note: UAE = United Arab Emirates; US = United States; Fed. = Federation.

The world's major producers of cereals, vegetable oils, and sugar are among the top exporters to Africa, reflecting its large imports of these products. The major cereal producers are Russia, Ukraine, Brazil, Argentina, and the United States; the main vegetable oil producers are Indonesia, Malaysia, Russia, and Argentina; and the main sugar producers are Brazil, India, China, and the United States.

In sum, the EAC is a relatively trade-introverted REC with strong agricultural activity. Like other African RECs, it exports not only many of the products traditionally exported by African countries (tea, coffee, tobacco) but also a lot of cut flowers. Like other African RECs, it imports a lot of cereals, vegetable oils, and sugar, and its main trading partners are European countries and the United States.

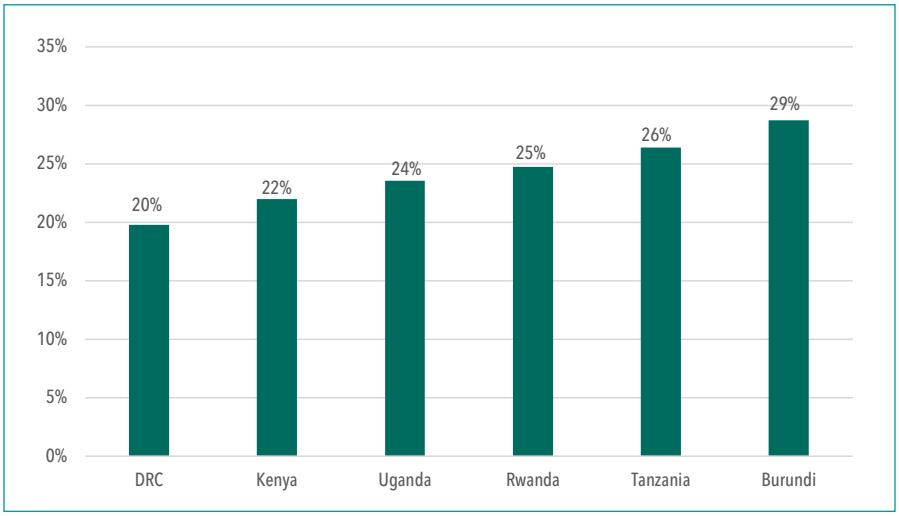
EAC Agricultural Trade at the Country Level

This section presents a series of trade indicators for each EAC country. We first focus on formal (registered) agricultural trade, and then on informal agricultural cross-border trade.

Key formal trade patterns of EAC countries

We present trade indicators constructed at the national level for six of the seven EAC countries. Figure 6.3 indicates the average share of agriculture, forestry, and fishing in GDP in six EAC countries over the period 2019–2021.

Figure 6.3 Share of agriculture, forestry, and fishing in GDP (%) by EAC country, 2019–2021 (average)

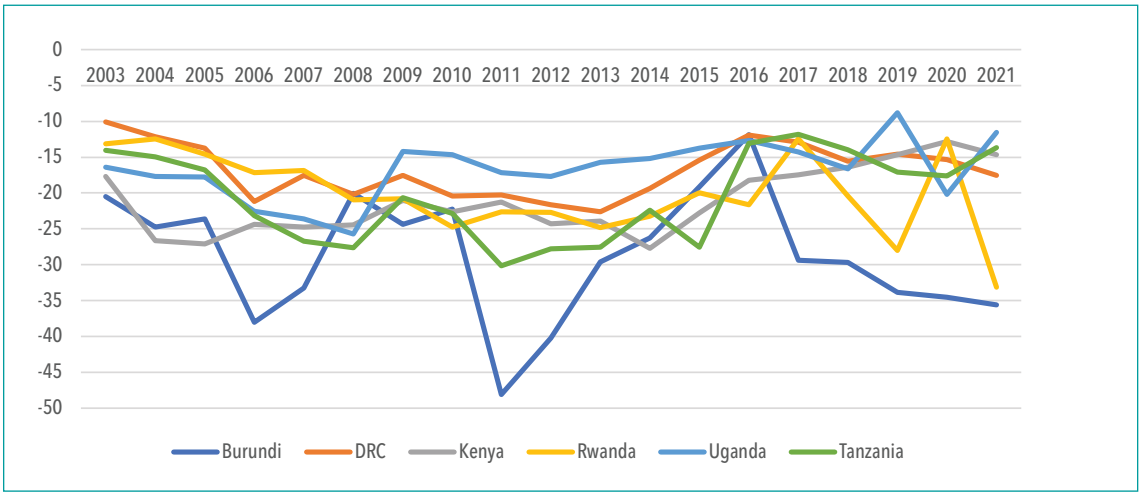


Source: World Development Indicators.

Agriculture represents 20–30 percent of GDP in these countries, significantly higher than its 4 percent share worldwide, indicating the importance of agriculture in the EAC. Burundi has the largest share of agriculture in GDP (28.7 percent), while DRC has the smallest share (19.8 percent).

Figure 6.4 indicates the trade balance in agriculture over GDP from 2003 to 2021 in the six EAC countries for which long-term statistical data are available. Substantial trade deficits in the agriculture sector of at least 10 percent of GDP each year can be seen in all six countries (and up to 45 percent in Burundi).

Figure 6.4 Trade balance in agriculture as a share of GDP by country, 2003–2021

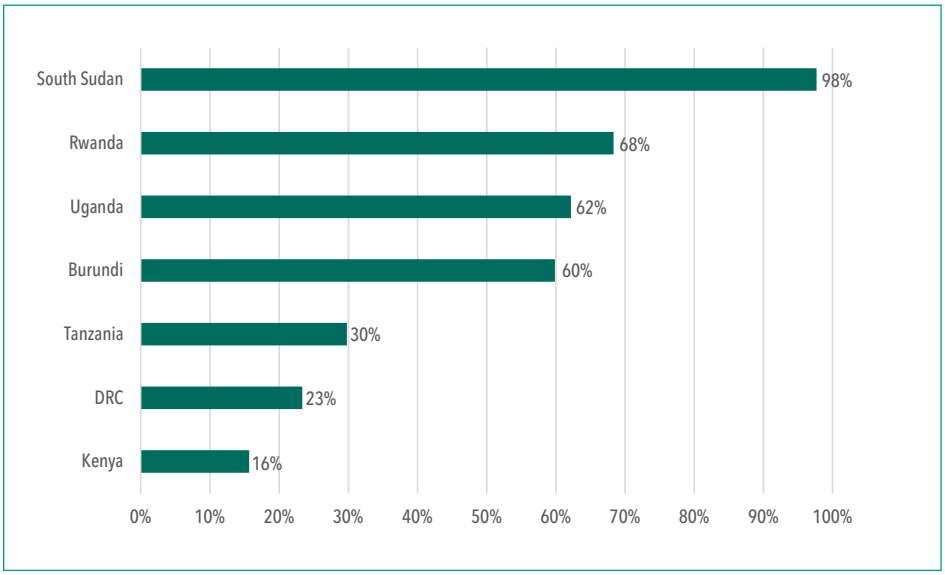


Source: Authors' construction from 2023 AATM database and World Development Indicators.

One possible explanation for this external deficit could be a "Dutch disease" mechanism: these countries have abundant natural resources, including not only gold (Burundi, Rwanda, South Sudan, Tanzania, Uganda) and oil (DRC, Kenya, Rwanda, South Sudan, Tanzania), but also copper, cobalt, diamonds (DRC), rare earth metals (Burundi), titanium (Kenya), and tin (Rwanda). The influx of foreign currency linked to these exports could have caused these countries' currencies to appreciate, rendering other sectors uncompetitive, particularly agriculture. Other possible explanations include inadequate access to fertilizer and credit, high domestic insecurity, and weak institutions.

Figure 6.5 indicates the share of intra-EAC agricultural trade in total agricultural trade for all EAC countries over the period 2019–2021.

Figure 6.5 Share of intra-EAC agricultural trade in total agricultural trade by country, 2019–2021 (average)



Source: 2023 AATM database and authors' calculations.

The share of intra-EAC agricultural trade in total agricultural trade differs significantly across countries ( ). Smaller countries such as Burundi, Rwanda, and South Sudan have a large share of intra-EAC agricultural trade; larger countries such as DRC, Kenya, and Tanzania have a smaller share. Trade with the rest of the world is easier for the latter three countries because they have maritime access, whereas the three smaller countries are landlocked, as is Uganda. A country's cost of trade with the rest of the world is higher when it is landlocked: products have to transit through other countries, imposing additional costs related to transportation, border crossings, and corruption. Infrastructure has been shown to be a key determinant of transport costs, especially for landlocked countries, and African countries tend to have poor infrastructure (Limão and Venables 2001; Cameron and Viviers 2017).

In which products are EAC countries competitive? Table 6.6 shows the 10 products for which each country has the highest revealed comparative advantage indicator in agriculture. A revealed comparative advantage indicator is constructed as the ratio of the share of that product in the country's total exports to its share in world trade. For example, an indicator of 5 means that the product in question accounts for five times more of the country's exports than of world exports.

Table 6.6 Top 10 revealed comparative advantages by EAC country, 2019–2021 (average)

Burundi		DRC		Kenya		Rwanda	
Description	RCA	Description	RCA	Description	RCA	Description	RCA
Tea, black	12350	Bran, sharps and other resid.	25416	Tea, black	15325	Flour of sago or of root	60829
Coffee; not roasted	4728	Cocoa beans; raw	7980	Nuts, edible; macadamia	9791	Bran, sharps and other resid.	9634
Bran, sharps and other resid.	3149	Vegetable products; n.e.c.	5791	Flowers, cut; roses	9664	Tea, black	8685
Coffee; husks and skin	2330	Plants and parts n.e.c.	3325	Meat; of goats	7330	Coffee; husks and skin	6084
Wheat or meslin flour	2112	Birds; live	2190	Plants, live; unrooted	5549	Cereal flour; of maize	4880
Coffee; decaff., not roasted	1108	Fruit, nuts and others	2055	Veg., leguminous; beans	4994	Juice; grapefruit	4548
Cigars, cigarillos and cheroots	934	Reptiles; live	1832	Vegetable prep.; beans	4970	Yeasts; active	3747
Liqueurs and cordials	780	Coffee; husks and skins	1795	Veg., leguminous; peas	3289	Resinoids	3600
Beverages, fermented	739	Vegetable saps and extracts	1746	Baking powders	2224	Wheat or meslin flour	2231
Beer; made from malt	673	Coffee; not roasted or decaff.	1472	Pineapples, prepared or preser.	2029	Vegetables, leguminous; beans	2080

South Sudan		Tanzania		Uganda	
Description	RCA	Description	RCA	Description	RCA
Lucerne (alfalfa) meal and pellets	265569	Pigeon peas	24498	Plants, live; unrooted	10268
Meat; of sheep	16078	Cashew nuts in shell	12894	Vanilla	6662
Natural gums and resins	14622	Cloves neither crushed nor gr.	9087	Plants, live; roses	5155
Gum Arabic	5060	Oil-cake and other solid resid.	7263	Coffee; not roast. or decaff.	3595
Lucerne (alfalfa) seeds	4851	Sesamum seeds	6142	Cotton; carded or combed	3210
Cereals; n.e.c.	4384	Chickpeas	5441	Cereal flour; of maize (corn)	3157
Veg.; onions and shallots	4314	Flour, meal and powder	4536	Sesamum seeds	1931
Sesame oil	2624	Hides and skins; raw	3651	Germ of cereals	1872
Leguminous o.t. peas, beans	1901	Millet	2821	Pigeon peas	1760
Offal of sheep, goats, horses	1694	Waxes, other than vegetable	2813	Dairy produce; milk and cream	1744

Source: 2023 AATM database and authors' calculations.

The most mentioned product (six times) among these national rankings is "Coffee, neither roasted nor decaffeinated" (HS 090111). Tea is the second most cited product, along with sesame seeds and raw cotton. The difference between tea and coffee in this region of Africa, known for the export of both stimulants, is that the value chain for tea is relatively short: tea leaves require rapid initial processing (fermentation and drying), without which the leaves lose all their quality. Coffee's value chain is more complex than that of tea (but less than that of chocolate). Processing of coffee beans is rarely done in Africa. African countries therefore export fermented or partially fermented tea and unprocessed coffee (neither roasted nor decaffeinated) (Aboushady, Roy, and Zaki 2022).

Another characteristic of the agricultural products exported by African countries is their small share in the global market. Many of the products exported by the seven EAC countries reflect this. Bouët and Sall (2021) show that over the period 2017–2019, the 30 agricultural products for which Africa has the highest revealed comparative advantage index are all characterized by a world market of limited magnitude (less than US$1.2 billion). For illustration, Africa has a significant comparative advantage in fonio but the world market for this cereal is only US$527 million, while it is US$63 billion for soya beans.

Table 6.7 provides another way to identify the products for which the EAC countries are performing: it presents each country's top 10 agricultural exports and the share of total agricultural exports. Black tea and unroasted coffee still appear as key export products for Burundi (76.7 percent of its total exports), Kenya (36.5 percent), Rwanda (35.6 percent), and Uganda (unroasted coffee represents almost 40 percent of total agricultural exports). The table reveals the high concentration of these countries' agricultural exports. South Sudan is an extreme case – 82.4 percent of its agricultural exports are concentrated in two products: alfalfa and onions/scallions. Burundi's first five products account for 93 percent of its exports. DRC's top three products comprise 74.9 percent of exports, while Kenya's top four export products account for 56.6 percent. This reveals these countries' strong dependence on a few products, which can create macroeconomic instability in the event of volatility in their world prices.

Table 6.7 Top 10 agricultural exports by EAC country as a share of total agricultural trade, 2019–2021 (average)

Burundi		DRC		Kenya		Rwanda	
Description	Share	Description	Share	Description	Share	Description	Share
Coffee; unproc.	52.3%	Cocoa beans; raw	43.5%	Tea, black	30.3%	Coffee; unproc.	18.4%
Tea, black	24.4%	Coffee; unproc.	16.3%	Roses, flowers and buds	15.8%	Tea, black	17.2%
Wheat or meslin flour	5.8%	Bran, sharps & other resid.	15.1%	Coffee; unproc.	6.2%	Palm oil	6.6%
Beer; made from malt	5.4%	Plants for perfum., pharm	3.6%	Avocados, fresh or dried	4.3%	Wheat or meslin flour	6.1%
Cigarettes	5.1%	Fruit, nuts; prep. or preserv.	3.5%	Beans shelled or unshelled	2.8%	Rice, semi or wholly milled	5.6%
Liqueurs and cordials	1.5%	Vegetable products	3.5%	Cigarettes	2.6%	Flour, meal	5.1%
Avocados, fresh or dried	0.7%	Palm oil	2.9%	Flowers for ornam. purposes	2.5%	Sucrose, chemically pure	3.5%
Beverages, fermented	0.6%	Vegetable saps and extracts	2.3%	Nuts, edible; macadamia	2.1%	Flour of sago, roots or tubers	3.5%
Coffee; decaff.	0.5%	Tobacco	1.4%	Plants, live; unrooted	1.7%	Yeasts; active	3.1%
Bran, sharps & other resid.	0.4%	Flour, meal	1.2%	Palm oil	1.6%	Bran, sharps & other resid.	2.1%

South Sudan		Tanzania		Uganda	
Description	Share	Description	Share	Description	Share
Lucerne alfalfa meals	74.5%	Cashew nuts	14.3%	Coffee; unproc.	39.8%
Onions and shallots	7.9%	Tobacco stemmed	9.6%	Cocoa beans; raw	6.1%
Natural gums, resins	4.2%	Sesamum seeds	9.0%	Milk and cream	5.0%
Meat of sheep	3.1%	Coffee; unproc.	7.8%	Sucrose, chemically pure	3.3%
Sesamum seeds	1.6%	Rice, semi or wholly milled	7.0%	Plants, live; unrooted	3.1%
Gum Arabic	1.1%	Pigeon peas	4.9%	Sesamum seeds	2.8%
Lucerne (alfalfa) seeds	0.8%	Chickpeas	3.9%	Cotton; unproc.	2.5%
Cotton; unproc.	0.6%	Maize (corn)	3.9%	Roses, flowers and buds	2.3%
Meat of bovine animals	0.6%	Cotton; unproc.	3.7%	Tobacco, raw	2.2%
Watermelons	0.6%	Soya beans	2.1%	Vanilla, unproc.	2.0%

Source: 2023 AATM database and authors' calculations.

Table 6.8 Top 10 agricultural imports by EAC country as a share of total agricultural trade, 2019–2021 (average)

Burundi		DRC		Kenya		Rwanda	
Description	Share	Description	Share	Description	Share	Description	Share
Wheat and meslin	17.3%	Rice, semi or wholly milled	6.6%	Palm oil	25.0%	Palm oil	13.1%
Sucrose, chemically pure	13.4%	Wheat and meslin	6.1%	Wheat and meslin	17.6%	Sucrose, chemically pure	11.9%
Husked (brown) rice	7.0%	Meat of fowls, cut	5.4%	Rice, milled	8.8%	Rice milled	9.7%
Cane sugar, raw	5.1%	Meat of fowls, not cut	4.9%	Sucrose, chemically pure	4.9%	Wheat and meslin	9.0%
Food preparations, n.e.c.	4.8%	Non-alcoholic beverages; n.e.c.	4.8%	Food preparations, n.e.c.	2.7%	Vegetable fats and oils	3.3%
Malt; not roasted	3.3%	Cane sugar, raw	4.2%	Maize (corn)	2.6%	Cane sugar, raw	3.1%
Palm oil	3.2%	Palm oil	4.0%	Milk and cream	2.1%	Malt; not roasted	2.9%
Meat prep. of bov. animals	2.7%	Wheat or meslin flour	3.1%	Palm oil	2.1%	Maize (corn)	2.3%
Malt; roasted	2.6%	Sweet biscuits	2.9%	Cane sugar, raw	2.1%	Tomato sauces	2.2%
Tobacco	2.4%	Food prep. of flour	2.9%	Grain sorghum	1.4%	Sunflower seed	2.1%
South Sudan		**Tanzania**		**Uganda**			
Description	Share	Description	Share	Description	Share		
Food preparations, n.e.c.	15.2%	Palm oil	25.8%	Palm oil	19.6%		
Grain sorghum	10.0%	Wheat and meslin	19.4%	Wheat and meslin	15.8%		
Beer; made from malt	7.0%	Sucrose, chemically pure, n.e.c.	8.1%	Cereals; rice, milled	11.5%		
Sucrose, chemically pure	4.6%	Rice, semi or wholly milled	5.5%	Sucrose, chemically pure	4.7%		
Palm oil	3.8%	Cane sugar, raw	2.5%	Vegetable oils; palm oil	4.3%		
Wheat or meslin flour	3.5%	Food preparations, n.e.c.	2.3%	Food preparations; n.e.c.	2.0%		
Peas shelled, dried	3.2%	Oil-cake from soya-bean	1.8%	Sugar confectionery	2.0%		
Cereal flour; of maize (corn)	3.1%	Malt; not roasted	1.7%	Yeasts; active	2.0%		
Rice, semi or wholly milled	2.8%	Maize (corn)	1.5%	Margarine	1.9%		
Food prep. of flour	2.6%	Sucrose, chemically pure	1.2%	Sauces and prep.	1.8%		

Source: 2023 AATM database and authors' calculations.

Table 6.8 shows the 10 most imported agricultural products by country. At the country level, we find what was already apparent at the REC level: these countries import a lot of three of the four major cereals (wheat, maize, rice), but they also buy a lot of calories (sugar, vegetable oils) from the rest of the world. In Kenya, Tanzania, and Uganda, three products (including palm oil and wheat) account for more than 50 percent of agricultural imports (47 percent in the case of Uganda).

Table 6.9 shows the top 10 destinations of all seven EAC countries' agricultural exports, while the top 10 origins of agricultural imports are shown in Table 6.10.

South Sudan is a special case as it exports 98.5 percent of its agricultural exports (lucerne, onions/scallions, and natural gum; Table 6.9) to the United Arab Emirates. The other EAC countries have fairly good geographic diversification of their agricultural exports, although this is somewhat less true for Rwanda: 52.3 percent of its agricultural exports go to three countries (DRC, Pakistan, and the United States).

Table 6.9 Top 10 destinations of agricultural exports by EAC country as a share of total agricultural trade, 2019–2021 (average)

Burundi		DRC		Kenya		Rwanda	
Destination	Share	Destination	Share	Destination	Share	Destination	Share
DRC	11.3%	US	16.2%	Netherlands	13.5%	DRC	36.6%
Pakistan	11.2%	Morocco	11.0%	Pakistan	11.3%	Pakistan	8.4%
Germany	10.8%	India	10.6%	UK	9.4%	US	7.3%
Uganda	8.1%	Belgium	10.3%	Egypt	5.0%	Uganda	7.2%
US	5.9%	Indonesia	9.8%	Uganda	5.0%	UK	5.3%
Oman	5.6%	France	5.2%	UAE	4.5%	Kenya	5.3%
Sudan	5.3%	Kenya	4.4%	Germany	3.9%	Ethiopia	3.4%
Belgium	4.1%	Netherlands	4.3%	US	3.4%	Germany	2.4%
China	4.0%	Türkiye	3.1%	France	2.6%	South Sudan	2.4%
Sweden	3.9%	Rwanda	3.0%	Russian Fed.	2.6%	Netherlands	1.9%

South Sudan		Tanzania		Uganda	
Destination	Share	Destination	Share	Destination	Share
UAE	98.5%	India	19.8%	Kenya	16.3%
Egypt	0.5%	Viet Nam	10.5%	Italy	12.1%
Netherlands	0.4%	Kenya	8.9%	Germany	8.7%
France	0.3%	China	8.6%	Netherlands	6.3%
Czech Rep.	0.2%	Uganda	5.0%	US	6.1%
Uganda	0.2%	Pakistan	4.1%	South Sudan	5.9%
Botswana	0.0%	Japan	3.8%	India	3.3%
Japan	0.0%	Rwanda	3.7%	Spain	3.2%
Mozambique	0.0%	Germany	3.7%	China	2.7%
Poland	0.0%	Netherlands	2.6%	Pakistan	2.7%

Source: 2023 AATM database and authors' calculations.
Note: UAE = United Arab Emirates; UK = United Kingdom; US = United States.

Table 6.10 Top 10 origins of agricultural imports by EAC country as a share of total agricultural trade, 2019–2021 (average)

Burundi		DRC		Kenya		Rwanda	
Exporter	Share	Exporter	Share	Exporter	Share	Exporter	Share
Uganda	10.2%	Zambia	17.7%	Indonesia	14.4%	Tanzania	15.9%
Tanzania	9.2%	Rwanda	10.9%	Malaysia	12.3%	Kenya	10.8%
Kenya	8.0%	Russian Fed.	6.1%	Uganda	7.0%	Indonesia	9.4%
Zambia	7.7%	Belgium	5.2%	Tanzania	6.3%	India	8.3%
Belgium	7.5%	Brazil	4.9%	Argentina	4.7%	Russian Fed.	5.3%
Russian Fed.	6.4%	Netherlands	4.9%	Russian Fed.	4.7%	Malawi	4.8%
China	6.3%	Kenya	4.6%	Pakistan	4.6%	Malaysia	4.4%
Malawi	4.9%	US	4.5%	India	3.4%	Belgium	3.9%
UK	4.9%	South Africa	4.2%	Egypt	3.3%	Egypt	3.8%
US	3.7%	France	4.2%	Australia	2.8%	Pakistan	3.6%
South Sudan		**Tanzania**		**Uganda**			
Exporter	Share	Exporter	Share	Exporter	Share		
Kenya	32.4%	Indonesia	17.5%	Kenya	28.3%		
Uganda	28.5%	Russian Fed.	11.4%	Tanzania	13.7%		
UAE	8.4%	Malaysia	9.2%	Indonesia	7.8%		
US	8.2%	India	6.1%	Argentina	5.8%		
Rwanda	3.6%	UAE	5.1%	Russian Fed.	4.6%		
Ethiopia	2.7%	South Africa	4.6%	India	4.4%		
China	2.5%	Pakistan	4.2%	Malaysia	4.3%		
India	2.5%	Kenya	3.7%	Rwanda	3.8%		
Brazil	1.5%	Zambia	2.9%	Egypt	2.8%		
Türkiye	1.4%	Türkiye	2.5%	China	2.1%		

Source: 2023 AATM database and authors' calculations.
Note: UAE = United Arab Emirates; UK = United Kingdom; US = United States; Fed. = Federation.

In summary, the EAC countries have trade characteristics similar to those of many African countries: tea, coffee, cocoa, and cotton are important exports; cereals, sugar, and vegetable oils are important imports. Yet they also have strong specificities, such as the importance of intracommunity trade.

Key informal trade patterns of EAC countries

Formal trade statistics underestimate actual trade patterns, so it is important to take informal trade into account.[8] It is well known that informal trade is substantial in Africa, and the EAC countries are no exception. To the best of our knowledge, there are three initiatives in the EAC aimed at measuring the magnitude and composition of informal trade in the regional economic community.

8 It is also worth mentioning that agricultural trade in the EAC is sometimes subject to border closures, import bans, and other restrictions; for example, the trade of poultry and sugar between Uganda and Kenya.

The Ugandan initiative

Surveys of informal cross-border trade (ICBT) in Uganda started in 2005 and are ongoing. They are operated and financed by the Uganda Bureau of Statistics (UBOS) and the Bank of Uganda, which publish an ICBT Survey report every year. These surveys aim to assess the volume and value of informal trade between Uganda and its neighbors (DRC, Kenya, Rwanda, South Sudan, and Tanzania). The goal is to provide an estimate of informal cross-border (ICB) exports and imports, primarily of agricultural and food commodities.

In 2019, the Uganda survey covered 20 border posts and 4 bus terminals; two enumerators were stationed at each point to observe trade and, when necessary, to interview traders, clearing agents, and revenue officers. Selection of the monitoring sites was primarily based on the significance of trade flows through the border post.

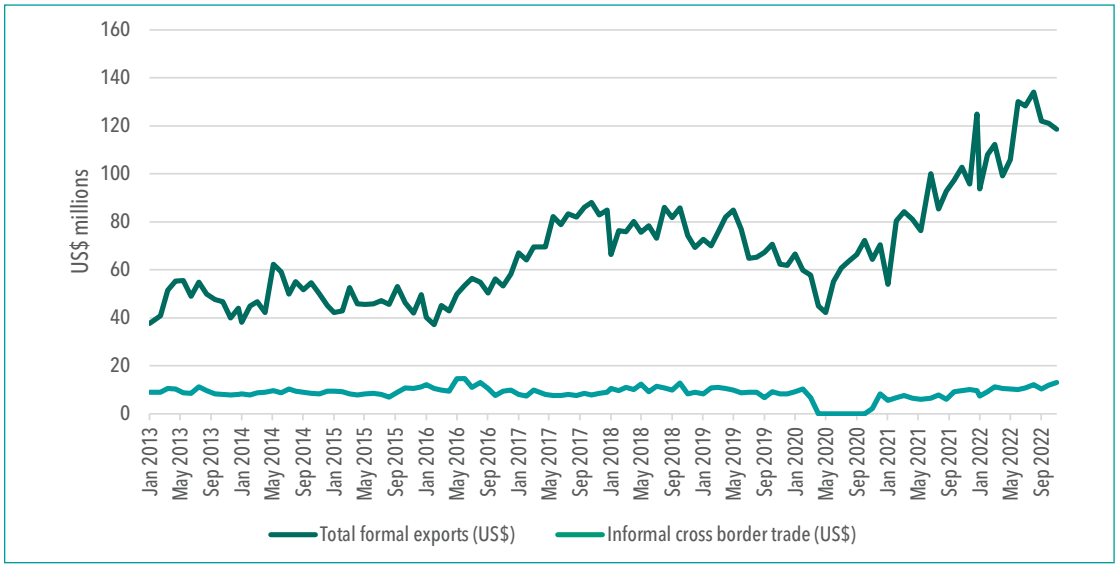
Data collected at the monitored posts include merchandise into/out of the country carried on foot, bicycles, pushcarts, motorcycles, vehicles, wheelchairs, donkeys, and boats, both in large and small quantities, which is not recorded by customs authorities, and undeclared or underdeclared merchandise from traders on formal customs declaration documents.

According to the 2020 UBOS report (UBOS 2020), informal trade amounted to 13 percent of formal trade in 2019, down from 15 percent in 2018. The total value of informal trade was US$532 million. In Uganda, agricultural products dominate informal imports (they represented 54 percent of total informal imports in 2019), while industrial products dominate informal exports (63 percent of total informal exports). DRC is the main destination of Uganda's informal exports (a 62 percent share of total informal exports), while the first origin of Uganda's informal imports is shared almost equally between DRC and Kenya (respectively, 40.7 percent and 40.4 percent in 2019). The main informal agricultural exports from Uganda are fish, beans, cattle, maize, fruit, and goats. The main informal agricultural imports into Uganda are beans, coffee, rice, bananas, wheat flour, and palm oil.

The Rwandan initiative

Rwanda's annual survey of informal trade is operated by the National Bank of Rwanda. It covers 17 official borders and 39 major crossing points (these are border crossings without border officers). Each border has between two and six enumerators. Figure 6.6 indicates the value of Rwanda's formal and informal exports between 2013 and 2022.

Figure 6.6 Value of Rwanda's formal and informal exports, January 2013 to December 2022



Source: National Bank of Rwanda; accessed on February 17, 2023. https://www.bnr.rw/

On average since the beginning of data collection, informal exports have represented 13.4 percent of total exports, while informal imports represented 3 percent of total imports. In 2022, informal exports represented 9.2 percent of formal exports (Figure 6.6).

Informal imports to Rwanda constitute a very low share relative to formal imports: 0.4 percent in 2019, and 0.1 percent in both 2020 and 2021.[9]

Unfortunately, the National Bank of Rwanda has no information about the share of agricultural goods in Rwanda's informal imports and exports or about product and geographic decomposition. Bouët, Pace, and Glauber (2018) provide information for 2014: Rwanda's informal agricultural exports mostly comprised meat, milk and cheese, roots and tubers, eggs, and pulses. Their first destination is DRC. It is interesting to note that Rwanda's government encourages the formation of cooperatives by small informal traders as a step before regularization.

In Rwanda as elsewhere in Africa, ICBT has a strong gender aspect. In Rwanda, the majority of small-scale cross-border traders are women (83 percent) and the majority (82 percent) of these traders confirmed that small-scale cross-border trade was their main source of income and food for their families (Bouët, Pace, and Glauber 2018).

The FSNWG initiative in East Africa

The United States Agency for International Development-sponsored Food Security and Nutrition Working Group (FSNWG), through its Market Analysis Subgroup, conducts a survey of ICBT between Burundi, DRC, Djibouti, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania, and Uganda. Started in 2005, this initiative covers 88 food commodities and livestock. The survey does not completely capture all ICBT in the region because collection is limited to selected borders; in addition, data are not collected 24 hours per day, 7 days per week or for all traded commodities. This survey provides a sample whose representativeness is not evaluated. FSNWG regularly publishes the results of the surveys on the FEWS Net website (https://fews.net/). We collected data concerning formal and informal agricultural trade in the EAC countries during the first quarter of 2021 from this source (Table 6.11).[10]

Table 6.11 Formal and informal trade in agricultural products in the EAC, first quarter 2021 (volume)

Product	Formal (metric tons)	Informal (metric tons)	Share of informal trade (%)	Border (Exp.-Imp.)
Cassava		2.8	100.0	BDI-TZA
*Chickens		2292	100.0	BDI-TZA
Sugar		30.15	100.0	BDI-TZA
Cooking Bananas		55.01	100.0	COD-UGA
Gonja		16.15	100.0	COD-UGA
Milled Rice		3.57	100.0	COD-UGA
Palm Oil, Refined		0.01386	100.0	COD-UGA
Rice		3.88	100.0	COD-UGA
Beans, dry	42.3		0	KEN- TZA
Maize (White)	189		0	KEN- TZA
Palm Oil, Refined	985	870	46.9	KEN- TZA
Potatoes, Irish	2366.4	32	1.3	KEN- TZA
Rice	28		0	KEN- TZA
Bananas		8174.986	100.0	TZA-BDI
Beans, dry		2.523	100.0	TZA-BDI

9 National Bank of Rwanda, accessed February 17, 2023. https://www.bnr.rw/
10 We are grateful to Thomas Awuor for making these data accessible.

Table 6.11 continued

Product	Formal (metric tons)	Informal (metric tons)	Share of informal trade (%)	Border (Exp.-Imp.)
Cassava		8.3	100.0	TZA-BDI
Cassava chips		117.242	100.0	TZA-BDI
*Cattle		10456	100.0	TZA-BDI
*Chickens		4364	100.0	TZA-BDI
Cooking bananas		24112.912	100.0	TZA-BDI
Dagaa / silverfish		341.239	100.0	TZA-BDI
Fish, dried		7.424	100.0	TZA-BDI
*Goats		7898	100.0	TZA-BDI
Groundnuts		49.02	100.0	TZA-BDI
Maize (White)		143.6	100.0	TZA-BDI
Maize flour		18.95	100.0	TZA-BDI
Oxen		18	100.0	TZA-BDI
Palm Oil, Refined		20.98	100.0	TZA-BDI
Rice		1438.824	100.0	TZA-BDI
*Sheep		4023.02	100.0	TZA-BDI
Sugar		7.5	100.0	TZA-BDI
*Swine / pigs		28	100.0	TZA-BDI
Wheat Flour		173.575	100.0	TZA-BDI
Bananas	169.155		0	TZA-KEN
Beans	2059.2	54.45	2.6	TZA-KEN
Beans, dry	718.89	87.3	10.8	TZA-KEN
Black peas	567.9	12.6	2.2	TZA-KEN
Camels and cam.		1619	100.0	TZA-KEN
*Cattle		1398	100.0	TZA-KEN
Cooking Bananas	172.34		0	TZA-KEN
Fish, dried		163.59	100.0	TZA-KEN
*Goats		720	100.0	TZA-KEN
Groundnuts	3871.5	45.47	1.2	TZA-KEN
Maize (green)	373.59		0	TZA-KEN
Maize (White)	11526.98	377.31	3.2	TZA-KEN
Millet	1022.31	32.3	3.1	TZA-KEN
Palm Oil, Refined	72	68	48.6	TZA-KEN
Peas, Dry	1068.03	644.13	37.6	TZA-KEN
Potatoes, Irish	439.46		0	TZA-KEN
Rice	13981.02	661.25	4.5	TZA-KEN
Sorghum	333	26.82	7.5	TZA-KEN
Sweet Potatoes		164.16	100.0	TZA-KEN
Yams		161.64	100.0	TZA-KEN
Fish, dried	18.27		0	TZA-RWA
*Cattle	6625	2058	23.7	UGA-COD

Table 6.11 continued

Product	Formal (metric tons)	Informal (metric tons)	Share of informal trade (%)	Border (Exp.-Imp.)
Fish, dried	0	47.75	100.0	UGA-COD
Fish, dried	0	47.75	100.0	UGA-COD
*Goats	2225	639	22.3	UGA-COD
Maize Flour	0	57.22	100.0	UGA-COD
Potatoes, Irish	0	5.44	100.0	UGA-COD
*Sheep	1015	408	28.7	UGA-COD
Tomatoes	0	5.29	100.0	UGA-COD
Wheat Flour	0	8.71	100.0	UGA-COD
Beans, Dry	54004.5	0	0	UGA-KEN
Maize (White)	89439.57	4942.7	5.2	UGA-KEN
Millet	17922.9	0	0	UGA-KEN
Sorghum	22340.2	0	0	UGA-KEN
Beans	15405.95	0	0	UGA-SSD
Beans, dry	7809.35	5905.8	43.1	UGA-SSD
Cassava Chips	76.4	3.4	4.3	UGA-SSD
*Cattle	1364	727	34.8	UGA-SSD
Dagaa / silverfish	85.575	20.1	19.0	UGA-SSD
*Goats	5489	2426	30.7	UGA-SSD
Lentils	33.25	10	23.1	UGA-SSD
Maize (White)	26200	0	0	UGA-SSD
Maize flour	30882.625	7103.97	18.7	UGA-SSD
Maize grain	12521.35	6092.5	32.7	UGA-SSD
Onions	152.1	322.2	67.9	UGA-SSD
Potatoes, Irish	15.82	6.79	30.0	UGA-SSD
Rice	25693.75	5575.81	17.8	UGA-SSD
Salt	278.52	9	3.1	UGA-SSD
Sesame	15	0	0	UGA-SSD
*Sheep	2490	1344	35.1	UGA-SSD
Sorghum (Brown)	52748.5	4767.5	8.3	UGA-SSD
Sorghum (Red)	387	73.9	16.0	UGA-SSD
Sugar	26111.9	6343.475	19.5	UGA-SSD
Veg. oils, refined	9029.66	1882.86	17.3	UGA-SSD
Wheat flour	28163.34	5623.25	0.2	UGA-SSD

Source: FEWS NET.
Note: * herds of animals. Countries are named by ISO 3-letter codes: BDI=Burundi; COD=DRC; KEN=Kenya; SSD=South Sudan; TZA=Tanzania; UGA=Uganda. Exp.=exporter; imp.=importer; cam.=camels; veg=vegetable.

The share of informal agricultural trade varies greatly from one border to another. However, some borders are characterized by a high share of informal trade, like the one between Burundi and Tanzania.

According to these statistics, the most traded commodities in the EAC are white maize, dry beans, and brown sorghum, and cattle and goats are the most traded animals. Informal trade is heavily concentrated in plantains and bananas along with cattle and goats. Certain commodities are only traded informally, and these vary from one border to another. Agricultural products like beans, white maize, and sesame exported from Uganda to South Sudan are mostly driven through the formal channel; other products like sorghum, rice, and maize flour use both channels. From Tanzania to Burundi, all products are traded informally, so in this case taking into account data on informal trade drastically changes the picture.

Factors of Agricultural Trade Integration

The previous section showed that agricultural trade in the EAC is relatively introverted compared to other African RECs. What explains this introversion? To answer this, we identify the factors of agricultural trade integration and impediments to the free circulation of agrifood products. We present the importance of customs duties, the importance of NTMs, and the quality of logistics in each EAC country.

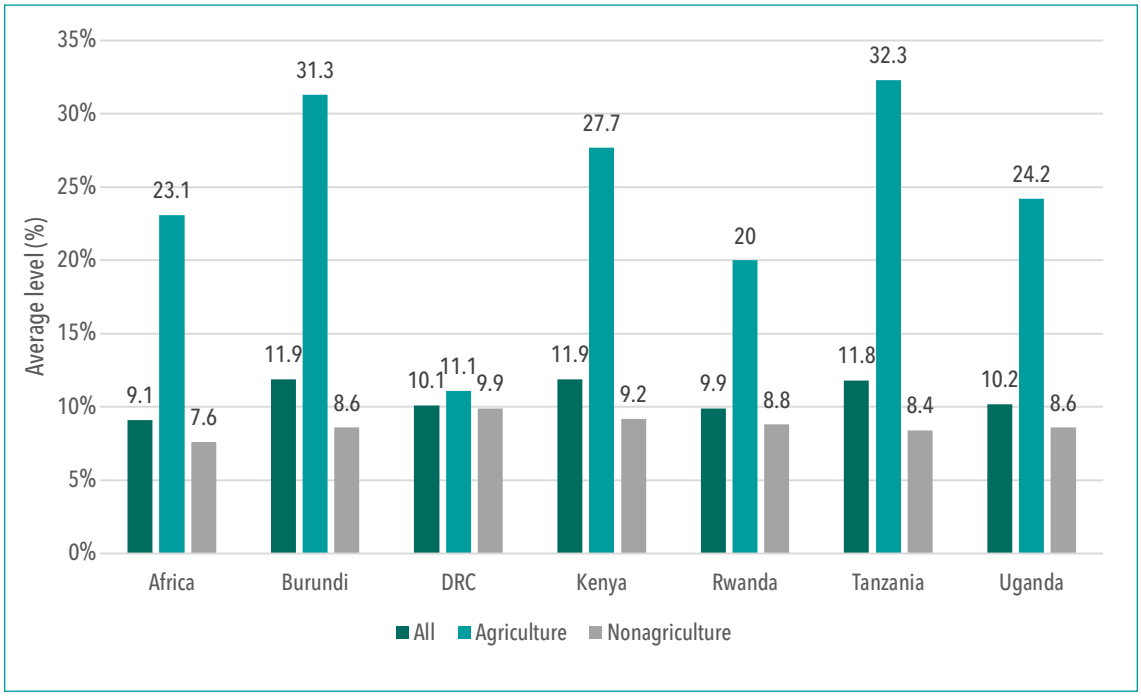
Tariffs

We use CEPII's[11] MacMAPs-HS6 database to measure the importance of agricultural protection in EAC countries. This database has the advantage of covering most tariff instruments and, above all, of taking into account all regional and preferential regimes for each country. It therefore offers, at the 6-digit Harmonized System level, a bilateral measure of protection and a disaggregated measure that can be aggregated on all dimensions: instruments of protection by calculating ad valorem equivalents, countries notifying protection, partner countries penalized by this protection, and products.

The academic literature has clearly shown that trade costs must be measured in a relative, not just an absolute, manner: a 10 percent tariff must not be considered in isolation, but compared with tariffs penalizing imports of other products and those penalizing imports of the same product from other origins (Anderson and Van Wincoop 2003). We therefore report on protection not only for agricultural products from EAC countries, but also for industrial products, and compare the protection that each EAC country places on agricultural imports from other EAC countries with that on imports from outside the EAC. Figure 6.7 shows the average tariff imposed by six of the seven EAC countries (data for South Sudan are not available in MacMAPs-HS6) for all products, for agricultural products only, and for nonagricultural products. We also show the average protection at the continent level.

11 Centre d'Études Prospectives et d'Informations Internationales.

Figure 6.7 Average level of import duties on all products, agricultural imports, and nonagricultural imports, 2019



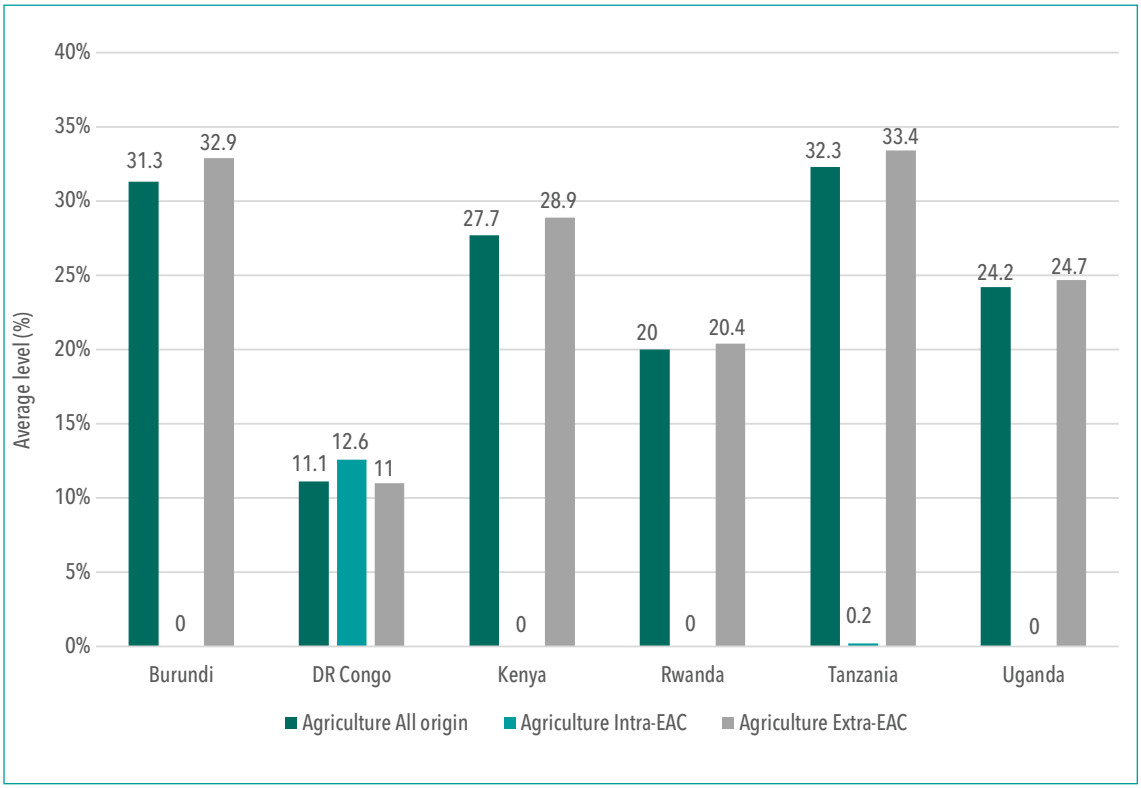
Source: MacMaps-HS6 except for Burundi: WTO.org, accessed in February 2023.
Note: The statistic for Africa takes into account import duties applied by EAC countries.

Overall, protection in EAC countries is relatively high and above the average of the African continent as a whole. Burundi and Kenya, followed closely by Tanzania, are the most protectionist countries. Protection is much higher in the agriculture sector, particularly in Tanzania and Burundi, with average protection above 30 percent, which constitutes high protectionism. DRC is the least protectionist country.

Agricultural protectionism obviously favors farmers in these countries (Figure 6.1 indicated that agriculture is an important activity here), but it can undermine food security by raising the consumer price of agricultural products.

Figure 6.8 gives the average level of import duties on agricultural imports from all origins and on intra- and extra-EAC imports.

Figure 6.8 Average level of import duties on all agricultural imports, intra-EAC imports, and extra-EAC imports, 2019



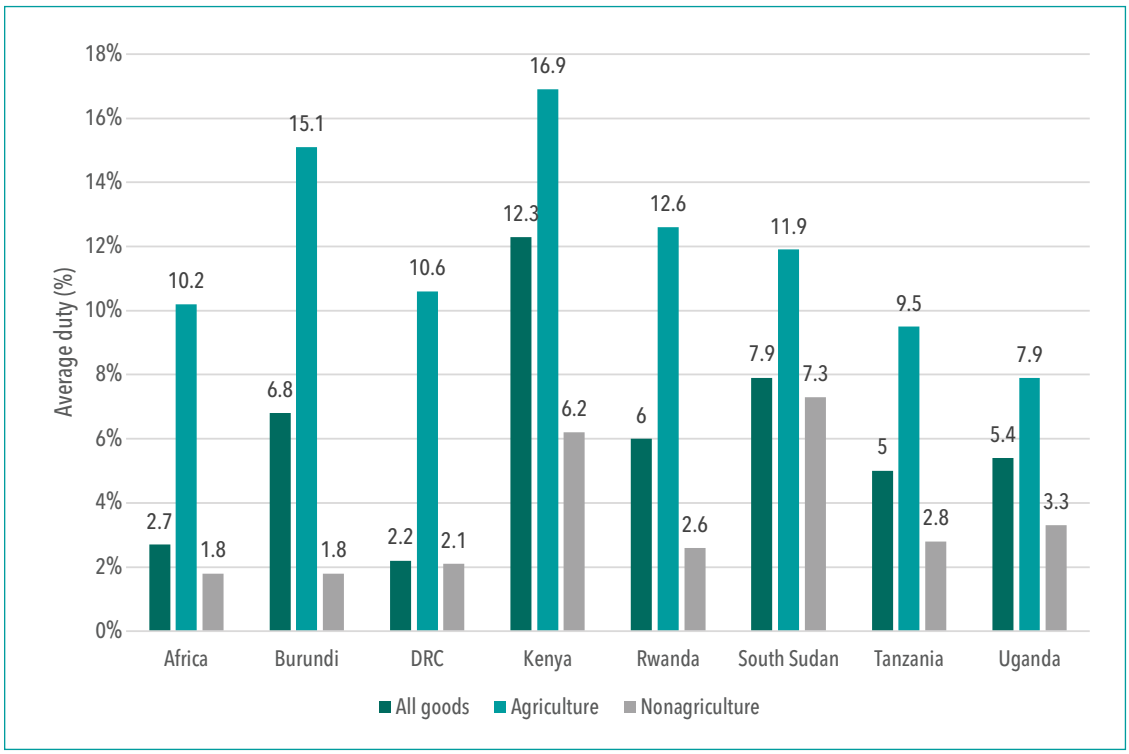
Source: MacMaps-HS6 except for Burundi; WTO.org, accessed in February 2023.

Figure 6.8 provides important insights that may explain the relative introversion of EAC countries. This figure gives the average protection rates of EAC countries in agriculture vis-à-vis all partners (elements from Figure 6.7 are included), and also relative to EAC and non-EAC partners.

Tariffs on intra-EAC agricultural trade still existed in 2019 due to the progressive inclusion of DRC in the EAC. More importantly, while customs duties relative to the rest of the world are high, those on intra-EAC trade are zero (or very close to zero in DRC), corresponding to the establishment of a customs union. This encourages the introversion of EAC agricultural trade as tariffs on intraregional flows are zero, while they are all greater than 10 percent on extraregional flows (and greater than 20 percent in DRC is not considered).

Figure 6.9 shows the average rates of protection faced by EAC countries when exporting products (for all products, agricultural products only, and nonagricultural products).

Figure 6.9 Average duty faced on exports, 2019



Source: MacMaps-HS6 – CEPII.

Note: The statistic for Africa takes into account import duties faced by EAC countries.

These average export protections depend on preferences granted under trade agreements, and also on the product and destination composition of each EAC country's agricultural exports. These figures indicate that for extra-EAC exports, EAC economies have an incentive to export nonagricultural products, particularly Burundi, where the protection on its agricultural exports is more than eight times higher than on nonagricultural products.

Nontariff measures

Tariffs are not the only impediment to agricultural trade that governments can impose. Other protectionist policy options include NTMs. Very little information exists on NTMs adopted by EAC countries. According to the World Trade Organization's I-TIP database, the only NTMs adopted by these countries are sanitary and phytosanitary (SPS) measures. According to this database, African countries adopt an average of 31.8 SPS measures, less than the world average of 97.6, although Kenya, Tanzania, and Uganda have each adopted more than 149 measures.

Table 6.12 Number of notified SPS NTMs, 2022

Country	Number of notified SPS measures
Africa total	1,017
Africa average	32
World total	12,684
World average	98
Burundi	8
DRC	2
Kenya	149
Rwanda	1
Tanzania	160
Uganda	173

Source: WTO; accessed February 22, 2023. http://i-tip.wto.org/
Note: The statistic for Africa includes EAC countries.

In summary, EAC countries like Burundi, DRC, and Rwanda impose very few SPS measures while Kenya, Tanzania, and Uganda adopt many more SPS measures than other African countries and the rest of the world.

The trade impact of NTMs has been well documented, but EAC countries are absent in recent trade impact assessments (see, for example, Kee, Nicita, and Olarreaga 2009, and Nguyen, Bouët, and Traoré 2022). Overall, these studies conclude that the ad valorem equivalent of NTBs is very high, but it varies significantly across studies. Other important conclusions from a political point of view, particularly for agriculture and African countries, are that these barriers are high in agriculture, that they are adopted to a relatively large extent in the European Union, and that they particularly affect exports from least developed countries (Disdier, Fontagné, and Mimouni 2008).

Logistic performance

We supplement this tariff and nontariff information with a measure of logistic performance using the World Bank's Logistic Performance Index (LPI) for 2023 (and 2018 when 2023 is missing). Table 6.13 shows the LPI for six of the seven EAC countries (South Sudan is missing from this database), and we calculated simple averages for the African continent and for the world.

Table 6.13 Logistic Performance Index, 2023

Country	LPI score	Customs	Infrastructure	International shipments	Logistics competence	Timeliness	Tracking and tracing
World average	3.0	2.8	2.9	2.9	3.0	3.2	3.1
African average	2.5	2.3	2.3	2.5	2.5	2.7	2.5
Burundi*	2.1	1.7	2.0	2.2	2.3	2.2	2.0
DRC	2.5	2.3	2.3	2.5	3.1	2.8	2.5
Kenya*	2.8	2.7	2.6	2.6	2.8	3.1	3.2
Rwanda	2.8	2.5	2.9	2.4	3.0	3.1	3.0
Uganda*	2.6	2.6	2.2	2.8	2.5	2.4	2.9

Source: World Bank. Global Rankings 2023 and Logistics Performance Index (worldbank.org), accessed May 15, 2023.
Note: LPI=Logistic Performance Index; * indicates data from 2018. The LPI range is 1 to 5, with a higher score indicating a better performance.

This index is calculated from a survey of logistics professionals in each country. The survey focuses on six areas: the efficiency of customs and clearance procedures; the quality of trade and transport infrastructure; the ease with which shipments of goods can be arranged at competitive prices; the competence and quality of logistics services; the ability to track shipments; and the timeliness of deliveries and shipments.

Since this indicator was first developed by the World Bank, high-income countries have been at the top of the global hierarchy. The logistic performance of African countries in general is low relative to the rest of the world. Burundi's overall LPI score and for each of the six components is relatively low compared to those of the African continent as a whole. Other EAC countries have scores higher than the African average, especially Kenya and Rwanda, on all components.

Logistics and the quality of transport infrastructure and customs procedures play an important role in terms of participation in international trade. On the basis of a gravity equation, Marti, Puertas, and Garcia (2014) show that any improvement in a country in one of the components of this indicator has a significant and positive impact on its trade. This result applies in particular to many African countries.

Concluding Remarks

The EAC and ECOWAS have the highest values in terms of share of agriculture in GDP, exceeding 20 percent over the period 2019–2021. Furthermore, the EAC has the highest Regional Trade Introversion Index.

The various RECs in Africa show a diversity of agricultural exports: fruits and vegetables in AMU; coffee, tobacco, black tea, and cut flowers in the EAC and COMESA; cocoa beans, cashew nuts, and cotton in ECOWAS; and tobacco, oranges, and grapes in SADC. However, imports seem to be similar across RECs—cereals, oils, and milk remain important agricultural products.

Except for South Sudan, which almost exclusively exports to the United Arab Emirates (98.5 percent), the destinations of other EAC member states' exports are diversified to Asia, the United States, Europe, and neighboring countries. The origins of imports seem to be more diverse than the destinations of exports for all EAC countries.

The average share of the agriculture, fishing, and forestry sector in GDP ranges from 19.8 percent (DRC) to 28.7 percent (Burundi). The ratio of the trade balance in agriculture to GDP is lowest (and negative) in Burundi, with collapses in 2006 (−38.1 percent) and 2011 (−48.1 percent), and to a lesser extent, in Rwanda from 2019 (−28.1 percent) to 2021 (−33.1 percent). For the remaining countries, this ratio fluctuates between −10 percent and −25 percent. At the other end of the spectrum, South Sudan has the highest share of intra-EAC agricultural trade to total agricultural trade (98 percent); Rwanda (68 percent), Uganda (62 percent), and Burundi (60 percent) have intermediate values; the remaining countries have shares of less than 30 percent, suggesting they mainly trade outside the EAC.

Agricultural exports mainly comprise coffee and tea for Burundi and Rwanda; black tea and cut flowers for Kenya; cocoa beans, coffee, bran sharps, and other residues for DRC; luceme (alfalfa) meals and pellets for South Sudan; cashew nuts, tobacco, and sesame seeds for Tanzania; and coffee, cocoa beans, milk, and cream for Uganda.

Important (and long-standing) initiatives measure informal trade in the EAC, as it is still a prominent phenomenon, especially in agricultural products. In Rwanda, informal trade is becoming less important than formal trade and is mostly conducted by women.

One key explanation for the strength of intraregional trade is customs duties, which are zero on intraregional flows (except in DRC, which has not yet cancelled customs duties on

imports coming from EAC partners), but relatively high on extraregional trade flows. Logistic performance in the EAC is relatively high compared to other African countries, except in Burundi. However, this performance positively affects extraregional as well as intraregional trade flows.

What are the policy implications of this study? Three lessons can be drawn.

Trade in the EAC remains affected by colonial-era policies. EAC countries still export many of the same products in which they specialized during the colonial era, and which have the major disadvantage of being of low added value: unprocessed coffee, tea, cocoa beans, and unprocessed cotton. On the other hand, these countries import a massive volume of products that are essential for food security: wheat, rice, maize, vegetable oils, and sugar, as well as food preparations and nonalcoholic beverages. The agricultural policies of these countries should not only prioritize production of agricultural goods with higher added value, but also support the production of goods essential to food security (depending on their endowments and access to technology).

In terms of market access, the tariff structure favors intraregional trade: customs duties on intraregional trade are zero (except in DRC) but high on imports from the rest of the world. The advantage is that this tariff structure strengthens intra-EAC agricultural trade: this REC is characterized by a high degree of trade introversion. However, this tariff structure has a negative impact on food security by making essential foodstuffs more expensive within the customs union. The logistic performance of these countries is not good, and investments could be made to facilitate trade, in particular by improving customs and trade infrastructures (Table 6.13).

Informal trade is important in the EAC as in most African regions. However, it appears to be declining, particularly in Rwanda, but also in Uganda. Specific policies could be put in place to formalize this trade even more (Bouët, Pace, and Glauber 2018). Customs procedures have already been simplified, but the impact of this reform has been limited because many informal operators still have difficulty or are reluctant to comply with them. Associations of informal traders are working effectively in this area, in particular to help women formalize their commercial operations, and authorities are working on simplifying SPS barriers for them. In short, for many years there has been an awareness of the importance of the problem and a genuine political will to help these small traders.

References

Aboushady, N., D. Roy, and C. Zaki. 2022. "The Three Great Stimulants: An Analysis of the Cocoa. Coffee and Tea Value Chains in Africa." In *The African Agriculture Trade Monitor 2022*, edited by A. Bouët, P-S. Odjo, and C. Zaki, 88–138. Kigali, Rwanda: Akademiya 2063; Washington, DC: IFPRI.

Anderson, J.E., and E. Van Wincoop. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review* 93 (1): 170–192.

Basnett, Y. 2013. "Labor Mobility in East Africa: An Analysis of the East African Community's Common Market and the Free Movement of Workers." *Development Policy Review* 31 (2): 131–148.

Bouët, A., K. Pace, and J.W. Glauber. 2018. "Informal Cross-Border Trade in Africa: How Much? Why? And What Impact?" IFPRI Discussion Paper 1783. International Food Policy Research Institute, Washington, DC.

Bouët, A., and L.M. Sall. 2021. "African Participation in Global Agricultural Trade." In *The African Agricultural Trade Monitor 2021*, edited by A. Bouët, P.S. Odjo, and C. Zaki, 15–48. Washington, DC: IFPRI.

Cameron, M., and W. Viviers. 2017. *Identifying Realistic Export Opportunities for Rwanda Based on the TRADE-DSM Approach*. IGC Policy Paper. Potchefstroom, South Africa: North-West University.

Disdier, A-C., L. Fontagné, and M. Mimouni. "The Impact of Regulations on Agricultural Trade: Evidence from the SPS and TBT Agreements." *American Journal of Agricultural Economics* 90 (2): 336–350.

EAC (East African Community). 2004. *East African Community Customs Union: Implications and Benefits of the EAC Customs Union*. Arusha, Tanzania: EAC.

Eken, S. 1979."Breakup of the East African Community". *Finance and Development* 16 (4): 36–40.

Head, K., T. Mayer, and J. Ries. 2011. "The Erosion of Colonial Trade Linkages after Independence." *Journal of International Economics* 81 (1): 1–14.

Kaahwa, W.T.K. 2003. *East African Community: EAC Treaty and Challenges to the Community*. Arusha, Tanzania: EAC; Bonn, Germany: Secretariat and German Agency for Technical Co-operation-GTZ.

Kee, H., A. Nicita, and M. Olarreaga 2009. "Estimating Trade Restrictiveness Indices." *The Economic Journal* 119 (534): 172–199.

Limao, N., and A.J. Venables. 2001. "Infrastructure, Geographical Disadvantage, Transport Costs, and Trade." *World Bank Economic Review* 15 (3): 451–479.

Makame, A. 2012. "The East African Integration: Achievements and Challenges." *Great Insights* 1 (6): 75–83.

Martí, L., R. Puertas, and L. García. "The Importance of the Logistics Performance Index in International Trade." *Applied Economics* 46 (24): 2982–2992.

Mutambara, T.E., and N.F Bhebhe. 2019. "The Proposed Tripartite Free Trade Area: Challenges and Expected Benefits." *MIBES Transaction International Journal* 13 (1): 95–120.

Nguyen, D.B., Bouët, A., and Traoré, F. 2022. "On the Proper Computation of Ad Valorem Equivalent of Non-Tariff Measures." *Applied Economics Letters* 29 (4): 298–302.

Samuel Hall, Maastricht University, and University of Oxford. 2017. "Understanding Intra-regional Labor Migration in the East African Community (EAC) – Literature Review." Samuel Hall.

UBOS (Uganda Bureau Of Statistics). 2020. *The Informal Cross Border Trade Survey Report 2019*. Kampala.

Willenbockel, D. 2014. "An Ex-Ante General Equilibrium Analysis of the COMESA-EAC-SADC Tripartite Free Trade Agreement." Paper presented at the *International Conference on Economic Modeling–EcoMod,* July, Bali, Indonesia.

SUMMARY AND CONCLUSIONS

Against the background of worldwide trade disruptions and climate change impacts, *the 2023 Africa Agriculture Trade Monitor* explores recent trends and patterns in Africa's global and regional agricultural trade. Like the preceding editions, the report uses a database that corrects for discrepancies in trade flow values as reported by importing and exporting countries. This section summarizes the key findings discussed in the report's six chapters and related policy implications for successful implementation of the African Continental Free Trade Area Agreement.

Climate change stands out as the most important threat to the development of Africa's agricultural trade. Rising temperatures are driving more serious and less predictable droughts and floods; reducing soil fertility and the area of viable arable land; increasing the frequency of pests and diseases; and affecting crop and livestock productivity, farm labor availability and productivity, and agricultural output and export potential. Likely trade effects of climate change include shifts of comparative advantages between and within world regions, causing significant changes in trade flows. However, there is a reverse causality between climate change and trade, as the latter also affects the former through carbon emissions associated with production and transportation of goods. More interestingly, trade can play a significant role in adapting to and mitigating climate change effects. Trade can slow climate change through an intelligent use of countries' comparative advantages in a way that saves water and other scarce resources globally or regionally. Hence, Chapter 1 argues that trade policy can play an important role in facing the challenges of climate change through the inclusion of environmental provisions in regional trade agreements (RTAs). The literature shows that such provisions are generally associated with better environmental outcomes and thus can contribute to curbing the negative effects of climate change. Currently, environmental provisions are not always included in agreements involving African countries and when they are, they generally are not legally enforceable, with the only exception being the free trade agreement between Morocco and the United States. While the AfCFTA protocol on investment includes provisions related to the environment and climate change, it will be important to add an institutional arrangement to improve their enforceability.

A broader look at the importance of including legally enforceable agriculture-related provisions in RTAs is explored through an empirical analysis of the impact of existing agreements on Africa's trade in agriculture in Chapter 2. African countries are involved in several RTAs, including free trade agreements under regional economic communities (RECs), and trade agreements with European partners, the United States, and other developing and emerging countries. These agreements have good coverage in terms of the number of provisions (horizontal depth). The Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC) are horizontally deeper than the other RECs, and African RTAs involving the European Union are deeper than those with the rest of the world. However, agreements involving extra-African partners include a larger share of legally enforceable provisions (vertical depth) compared with intra-African agreements, with COMESA and EAC again being the vertically deepest RECs.[1] The empirical gravity-type analysis indicates no significant impact of African RTAs on the continent's agricultural trade. However, the horizontal coverage of provisions related to agriculture liberalization is associated with more trade, hence the importance of including agriculture provisions in trade agreements. This result suggests that the absence of broad horizontal coverage and legal enforceability of provisions that may affect agriculture is likely to undermine the effectiveness of the AfCFTA agreement. Thus, if negotiations focus only on tariff reductions, liberalization will be offset by the persistence of trade-impeding nontariff measures and behind-the-border policies.

1There is a high degree of overlap between COMESA and EAC countries.

Trade can not only increase economic growth and contribute to remunerative livelihoods but also improve diets in terms of quantity and quality. Findings in Chapter 3 indicate that Africa's global trade contributes significantly to meeting its total requirements of calories, proteins, and several micronutrients, including iron and zinc. Intra-African trade plays a relatively smaller role in meeting Africa's nutrient needs. This reflects the limited share of intra-African trade in Africa's total agricultural trade in value terms. Around 14 percent of Africa's total agricultural imports are sourced from within the continent, and 20 percent of total agricultural exports are destined to the continental market, suggesting that non-African countries (global markets) still predominate as trade partners to African countries. However, intra-African trade is an important source of vitamin A and vitamin B12, particularly for SADC and EAC countries, hence the importance of boosting regional trade to leverage its potential for filling nutrient gaps across the continent. Intra-African agricultural trade has increased significantly since the early 2000s, but as of 2021, remains below its peak value of US$16.1 billion recorded in 2013. Trade facilitation efforts will be essential to ensure that potential benefits from the AfCFTA are realized. In addition, investments in sanitary and phytosanitary (SPS) systems and capacities as well as support for traders in meeting technical requirements will help ensure that SPS and other food safety measures contribute to the safety of food supplies without disrupting trade.

Africa's balance of trade in cotton products has deteriorated from an average surplus of $6.7 billion in the 2006–2010 period to a deficit of $2.9 billion in the 2017–2021 period, due to a decreasing trend in exports and increasing trend in imports in value terms. Chapter 4's findings shed light on the continent's performance in the global cotton value chain. Africa mostly exports unprocessed products (low value added), primarily to extra-continental destinations, competing with the United States, Brazil, India, Australia, Greece, Türkiye, and Uzbekistan. It imports mostly processed cotton products (high valued added), primarily from China, India, and Türkiye, but also from Mauritius and South Africa, which are ranked among the 10 leading sources of African cotton imports. As an explanation of these trends and patterns, revealed comparative advantage (RCA) analysis indicates that African countries are primarily competitive in unprocessed products, while only Egypt reveals some comparative advantage in manufactured cotton products. To improve and diversify their competitiveness, African countries must address challenges in increasing yields and improving quality, expanding local capacity for lint and seed processing, and also managing highly volatile world prices for cotton, subsidies granted by the world's largest cotton trade players, and fluctuations in the Euro/US dollar exchange rate. While these difficulties affect African exporters' competitiveness in world markets, tariff protection limits their competitiveness in intra-African markets, with East and Central African countries appearing as the most protective countries by far. Low labor productivity, water stress and poor water management practices, lack of technology, and dependence on agricultural imports are other serious challenges facing the development of cotton production and trade in Africa. However, the AfCFTA agreement offers unprecedented opportunities to develop regional value chains by exploiting regional complementarities and integrating domestic markets, resources, and manufacturing bases across Africa. Drawing lessons from the history of cotton development in Africa, it is clearly crucial to involve farmer associations in developing policies and measures for the sector in a bottom-up fashion, rather than the top-down approach that is currently used. In addition, providing technical and financial support to smallholder cotton farmers is necessary to improve their productivity and help them export.

The Russia-Ukraine war has introduced an additional threat into already turbulent global markets. Findings discussed in Chapter 5 show that the shock has been significant: observed price increases have been substantial and supply (quantity) disruptions significant, especially for fertilizers and, to a lesser extent, for food, particularly wheat and vegetable oils. In these two

sectors, several African countries are highly exposed, raising concerns about the coming crop years and the continent's food security situation, which was already damaged by the COVID-19 pandemic. In contrast, on the export side, African countries are much less dependent on Ukraine and Russia. Unfortunately, policy responses from key players in the global agricultural and fertilizer markets added further disruption through export restriction measures. These "beggar-thy-neighbor" policies imposed by major food and fertilizer exporters reduce supplies and increase prices and volatility. Indeed, these measures put additional pressure on markets and threaten food security in least developed countries. In the short to medium term, establishing social safety net programs can be one way of building the resilience of vulnerable households in the current circumstances. In addition, scaling up extension services to optimize fertilizer use through the 4R approach (right source, right rate, right time, right place) is paramount for improving production. The AfCFTA agreement represents a timely opportunity to increase intra-African trade and mitigate the negative impacts of global crises. African countries should be more restrictive than the WTO rules by significantly limiting the use of export restrictions and by improving the notification systems within the RECs. In the long run, diversification is key. African countries should try to diversify their sources of imports as much as possible by developing existing African potential based on the continent's natural endowments and the use of new, and greener, technologies.

Trade in the EAC countries is still strongly marked by historical cropping choices. The findings in Chapter 6 indicate that these countries continue to export many of the same products in which they specialized during the colonial era, and which have the major disadvantage of being of low value added: unprocessed coffee, tea, cocoa beans, and unprocessed cotton. These countries import, on a massive scale, products that are essential for food security: wheat, rice, maize, vegetable oils, and sugar, along with food preparations and non-alcoholic beverages. The agricultural policies of these countries should not only give priority to the production of agricultural goods with higher value added, but also support the production of goods essential to food security. The existing tariff structure favors intraregional trade: customs duties on intraregional trade are zero in all member countries except for the Democratic Republic of the Congo, which joined the community in 2022, but are high on imports from the rest of the world. This tariff structure strengthens intra-EAC agricultural trade, as is reflected by a high degree of trade introversion. However, it has a negative impact on food security by making essential foodstuffs more expensive within the customs union. The logistics performance of EAC countries, despite recent improvement, is below the world average, and further investments could be made to facilitate trade by improving customs and trade infrastructure. Finally, informal trade is important in the EAC region as in most African regions. However, it appears to be declining, particularly in Rwanda and Uganda. Specific policies could be put in place to further formalize this trade.

Overall, this 2023 AATM examines important issues common to African countries, including climate change adaptation and mitigation, effectiveness of RTAs and AfCFTA, potential for regional trade to enhance food and nutrition security, export competitiveness and market access, resilience to external shocks and reforms, and diversification of products and markets. To address these issues, the report points to key policy actions to be considered as part of the AfCFTA implementation.

ReSAKSS
Regional Strategic Analysis and Knowledge Support System
by AKADEMIYA2063

AGRODEP
African Growth & Development Policy modeling consortium
by AKADEMIYA2063

ReSAKSS-Africawide
Kicukiro/Niboye KK 341 St 22 P.O. Box 1855
Kigali, Rwanda
Tel: +250 788 318 315
Email: resakss@akademiya2063.org
Website: www.resakss.org

AGRODEP
Kicukiro/Niboye KK 341 St 22 P.O. Box 1855
Kigali, Rwanda
Tel: +250 788 318 315
Email: info-agrodep@agrodep.org
Website: www.agrodep.org

AKADEMIYA

AKADEMIYA2063 Headquarters
Kicukiro/Niboye KK 341 St 22
P.O. Box 1855
Kigali, Rwanda
Tel: +250 788 318 315
Email: kigali-contact@akademiya2063.org
Website: www.akademiya2063.org

AKADEMIYA2063 Regional Office
Lot N*3 Almadies
P.O. Box 24 933 Ouakam
Dakar, Senegal
Tel: +221 33 865 28 81
Email: dakar-contact@akademiya2063.org
Website: www.akademiya2063.org

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI
1201 Eye St., NW, Washington, DC
20005-3915 USA
Phone : +1 202-862-5600
Fax : +1 202-862-5606
Email: ifpri@cgiar.org
Website: www.ifpri.org