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Africa Agriculture Trade Monitor 2021

Edited by Antoine Bouët, Getaw Tadesse, and Chahir Zaki

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CONTENTS

LIST OF APPENDICES VIII
LIST OF TABLES IX
LIST OF FIGURES X
ACRONYMS AND ABBREVIATIONS XIV
ACKNOWLEDGMENTS 1
FOREWORD 2
EXECUTIVE SUMMARY 4

CHAPTER 1 7
INTRODUCTION 8
AFRICA AND COVID-19 9
IMPLEMENTATION OF THE AFCFTA 11
ISSUES CONCERNING DATA AND METHODOLOGY 12
THE WAY FORWARD 13
REFERENCES 13

CHAPTER 2 15
INTRODUCTION 16
AN OVERVIEW OF AFRICAN TRADE IN AGRICULTURAL GOODS 16
African participation in global trade by sector 17
Comparative advantages 19
Economic complexity of African agricultural trade 22
Caloric content of exports and imports 28
AN OVERVIEW OF TRADE IN RESOURCES 31
Fertilizers and pesticides 31
Labor content in trade 32
Water content in trade 32
WHAT CAUSES THE WEAK PERFORMANCE OF AFRICA IN GLOBAL AGRICULTURAL TRADE? 34
Domestic causes 34
Trade policy causes 40
NTMs imposed by African countries 41
NTMs faced by African countries 42
CONCLUSION 46
REFERENCES 48

CHAPTER 3 51
INTRODUCTION 52
TRENDS AND PATTERNS IN INTRA-AFRICAN AGRICULTURAL TRADE 52
Total agricultural trade flows within Africa 52
Intra-African trade of selected primary commodities 55
INTRA-AFRICAN TRADE NETWORK FOR SELECTED PRIMARY PRODUCTS 59

How many countries and trade links are there over time? ... 60
Trade orientation ... 61
Market concentration in intra-African trade ... 63
Depiction of selected networks ... 65
OVERVIEW OF TRADE PROTECTION WITHIN AFRICA FOR THE SELECTED PRIMARY PRODUCTS ... 68
Tariffs ... 68
Nontariff measures ... 69
CONCLUSION ... 72
REFERENCES ... 74
APPENDIX ... 75
CHAPTER 4 ... 85
INTRODUCTION ... 86
GENERAL OVERVIEW OF TRADE FLOWS ... 87
The role of informal livestock trade ... 89
NET AFRICAN TRADE FLOWS OF LIVESTOCK PRODUCTS ... 92
Meat value chain ... 94
Dairy value chain ... 95
Poultry value chain ... 97
AFRICAN LIVESTOCK MARKETS: DESTINATIONS AND ORIGINS ... 101
Intra-African livestock trade ... 101
Meat and live animals ... 102
Dairy and poultry ... 102
Livestock trade between Africa and ROW ... 106
Origins of African global imports ... 107
Top African importers from ROW ... 109
African global livestock export destinations ... 110
TRADE POLICIES ... 114
Tariffs ... 114
Nontariff measures ... 119
RISKS TO AFRICAN LIVESTOCK SUPPLY CHAINS ... 123
Climate risks ... 123
Conflict ... 124
CONCLUSION ... 125
REFERENCES ... 126
APPENDIX ... 128
CHAPTER 5 ... 135
INTRODUCTION ... 136
POLICY RESPONSES ... 138
Overall policy responses ... 138
Focus on at-the-border policies ... 141

IMPACT TRANSMISSION CHANNELS 143
Vulnerability in the African balance of payments 143
Trade in goods 144
Tourism 147
Remittances 147
International aid 147
Effect on real exchange rates 148
Effect on trade costs 148
ASSESSMENT OF THE TRADE AND ECONOMIC IMPACT OF THE CRISIS 150
Impact on intra-African trade 150
Simulated impact on trade, GDP, and poverty 151
Simulating the impact on trade, GDP, and poverty 154
A global CGE model 154
Evaluating the socioeconomic impact by country from a household perspective 155
The case of Senegal 157
The case of Ghana 158
The case of Uganda 159
CONCLUSION 160
REFERENCES 162
CHAPTER 6 165
INTRODUCTION 166
HISTORICAL BACKGROUND 166
TRENDS AND STRUCTURE OF AGRICULTURAL TRADE 168
Overview of AMU agriculture and trade 168
Intraregional and extra-regional flows 170
Intraregional vs. extra-regional trade flows 170
Heterogeneity of AMU Members 171
Agricultural products exported and imported by AMU members 174
Top 10 exported and imported agricultural products 174
UNTAPPED POTENTIAL 175
WHY HAS THE AMU NOT ACHIEVED ITS OBJECTIVE? 178
The spaghetti bowl of North African agreements 179
Tariff structure 180
Nontariff measures 184
Trade logistics 189
Domestic institutions 195
CONCLUSION 196
REFERENCES 197
SUMMARY AND CONCLUSION 199
REFERENCES 202

LIST OF APPENDICES

Table A3 List of African country ISO-3 codes 75
Figure A3.1 Intra-African wheat exports network, 2003–2007 76
Figure A3.2 Intra-African wheat exports network, 2015–2019 76
Figure A3.3 Intra-African beans exports network, 2003–2007 77
Figure A3.4 Intra-African beans exports network, 2015–2019 77
Figure A3.5 Intra-African potato exports network, 2003–2007 78
Figure A3.6 Intra-African potato exports network, 2015–2019 78
Figure A3.7 Intra-African onions and shallots exports network, 2003–2007 79
Figure A3.8 Intra-African onions and shallots exports network, 2015–2019 79
Figure A3.9 Intra-African tomato exports network, 2003–2007 80
Figure A3.10 Intra-African tomato exports network, 2015–2019 80
Figure A3.11 Intra-African banana and plantain exports network, 2003–2007 81
Figure A3.12 Intra-African banana and plantain exports network, 2015–2019 81
Figure A3.13 Intra-African citrus exports network, 2003–2007 82
Figure A3.14 Intra-African citrus fruit exports network, 2015–2019 82
Figure A3.15 Intra-African apple exports network, 2003–2007 83
Figure A3.16 Intra-African apple exports network, 2015–2019 83
Table A4.1 List of HS codes by value chain 128
Table A4.2 Tariffs imposed by main agriculture producers, 2016 (%) 133

LIST OF TABLES

Table 2.1 Distribution by sector of Africa's agricultural exports and imports, and of global trade, 2003–2019 average 17

Table 2.2 Number and share of African RCAs at the HS6 level for each of 8 sectors, 2017–2019 and 2003–2005 averages 20

Table 2.3 Top 50 RCAs for agricultural products in Africa, 2017–2019 average 21

Table 2.4. List of African countries by group, 2003–2005 and 2017–2019 27

Table 2.5 Fertilizer use, production, and trade by nutrient, 2003–2005 and 2016–2018 (% of total) 31

Table 2.6 Pesticide trade participation by world region, 2003–2005 and 2016–2018 32

Table 2.7 Land use indicators by continent, 2016–2018 average 35

Table 2.8 Agricultural productivity by region, 2003–2006 and 2016–2018 averages 36

Table 2.9 Fertilizer consumption and cereal yields by region, 2016–2017 36

Table 2.10 AVEs of SPS barriers: Top 7 countries by GDP, 2018 (%) 43

Table 2.11 Ad valorem equivalents of technical barriers to trade: Top 7 countries in terms of GDP, 2018 (%) 45

Table 3.1 Definitions of products analyzed 55

Table 3.2 Top intra-African exporters and importers of selected products and corresponding trade share 58

Table 3.3 Network properties: Counting countries and trade relationships, 2003–2007 and 2015–2019 60

Table 3.4 Network properties: Reciprocity, clustering coefficient, homophily, and degree assortativity, 2003–2007 and 2015–2019 62

Table 3.5 Largest trade flows within Africa 63

Table 4.1 Share of African livestock export and import values, 2010–2014 and 2015–2019 averages 93

Table 4.2 Average share and ranking of top 10 exporters of live animals, 2015–2019 99

Table 4.3 Average share and ranking of top 10 exporters of meat products, carcasses and cuts, hides and skins, 2015–2019 100

Table 4.4 Number of nontariff measures imposed by EU and US, 2018 120

Table 4.5 Domestic support in the US and EU 122

Table 5.1 Poverty and macroeconomic impact projections, MIRAGRODEP COVID-19 scenarios 155

Table 5.2 COVID-19 incidence and deaths in Senegal, Ghana, and Uganda in the African context 156

Table 5.3 Summary results of estimated COVID-19 socioeconomic impacts in Senegal, Ghana, and Uganda 156

Table 6.1 Actual and untapped export potential by destination (US$ millions) 176

Table 6.2 Actual and untapped export potential by sector (US$ millions) 177

Table 6.3 AMU scores on the Africa Regional Integration Index, 2019 178

Table 6.4 Major free trade agreements of the AMU countries 180

Table 6.5 Top 10 intra–AMU tariffs at HS2 level, 2016 (%) 181

Table 6.6 Types of nontariff measures in AMU countries, 2017 186

Table 6.7 Nontariff measures in agriculture sectors of AMU countries, 2017 187

LIST OF FIGURES

Figure 2.1 Share of African exports in world exports by sector, 2003–2019 (%) ... 18

Figure 2.2 Share of African imports in world imports by sector, 2003–2019 (%) ... 19

Figure 2.3 Share of RCAs (at HS6 level) in 8 sectors by processing stage, 2003–2005 and 2017–2019 (%) ... 22

Figure 2.4 Classification of countries ... 23

Figure 2.5 Method of reflection: Classification of African and other countries, 2017–2019 ... 25

Figure 2.6 Method of reflection: Classification of African and other countries, 2003–2005 ... 26

Figure 2.7 Caloric trade balance, 2016 (kcal per person per day) ... 28

Figure 2.8 African caloric exports, imports, and trade balance, 2016 (kcal per person per day) ... 29

Figure 2.9 Geographic structure of calorie imports of African countries, 2017 (%) ... 30

Figure 2.10 Labor content in agricultural trade in 2011, share of value added (%) ... 33

Figure 2.11 Virtual water export–import balance for 1986, 1993, 2000, and 2010 (m^3) ... 34

Figure 2.12 Share of public agricultural expenditure in agricultural value added, 2017–2019 average (%) ... 38

Figure 2.13 Share of agricultural value added in total GDP, 2017–2019 average (%) ... 38

Figure 2.14 Share of public agricultural expenditure in total expenditure, 2017–2019 average (%) ... 38

Figure 2.15 Agricultural research spending in developing countries, total and share of agricultural GDP ... 39

Figure 2.16 Number of researchers in developing countries, per farmer and per capita ... 40

Figure 3.1a Trends in intra-African agricultural trade, 2003–2019 (US$ billions) ... 53

Figure 3.1b Intra-African agricultural export shares, 2003–2019 (%) ... 54

Figure 3.1c Intra-African agricultural import shares, 2003–2019 (%) ... 54

Figure 3.2 Average annual value of intra-African trade for selected commodities ... 57

Figure 3.3 Share of intra-African trade in total African trade of selected commodities ... 58

Figure 3.4 Intra-African rice exports network, 2003–2007 ... 66

Figure 3.5 Intra-African rice exports network, 2015–2019 ... 66

Figure 3.6 Intra-African maize exports network, 2003–2007 ... 67

Figure 3.7 Intra-African maize exports network, 2015–2019 ... 67

Figure 3.8 Weighted average tariff rates between Africa and the international market, 2016 (%) ... 68

Figure 3.9 Weighted average tariff rates within RECs in Africa, 2016 (%) ... 69

Figure 3.10 Frequency and coverage of NTMs by African country, 2018 (%) ... 70

Figure 3.11 Prevalence score of NTMs by African country, 2018 ... 71

Figure 3.12 Ad valorem equivalents of SPS measures and TBTs in African countries, 2018 (%) ... 71

Figure 4.1 African formal exports, intra-African and extracontinental, annual average 2010–2019 ... 88

Figure 4.2 African imports from rest of the world, annual average 2010–2019 ... 89

Figure 4.3 Formal intra-African exports of live animals in East Africa, annual average 2010–2019 ... 90

Figure 4.4 Informal intra-African exports of live animals in East Africa by country, 2010–2019 totals ... 91

Figure 4.5 Total informal exports of live animals in East Africa, 2010–2019 91

Figure 4.6 Continent-level net exports by stage of processing of meat, dairy, and poultry value chains, averages 2010–2014 and 2015–2019 92

Figure 4.7 Net African exports of livestock products, 2003–2019 (US$ billions) 93

Figure 4.8 Net exports of Africa of meat and animals by processing stage, 2003–2019 (US$ billions)..... 94

Figure 4.9 Meat and animal net exports by stage of processing, country averages 2015–2019 (US$ millions) 95

Figure 4.10 Net African dairy exports, 2003–2019 (US$ billions) 95

Figure 4.11 Net dairy exports by African country and stage of processing, average 2015–2019 (US$ millions)..... 96

Figure 4.12 Net African poultry exports by processing stage, 2003–2019 (US$ billions)..... 97

Figure 4.13 Net poultry exports by processing stage, average 2015–2019 (US$ millions)..... 98

Figure 4.14 Top intra-African importers and exporters of livestock products, annual average 2010–2019 .....

Figure 4.15 Top 10 intra-African exporters of live animals and meat, annual average 2010–2019 103

Figure 4.16 Top intra-African importing countries, animals and meat, annual average 2010–2019 104

Figure 4.17 Top 10 intra-African dairy exporters, annual average 2010–2019 104

Figure 4.18 Top intra-African dairy importers, annual average 2010–2019..... 105

Figure 4.19 Top 10 intra-African poultry exporters, annual average 2010–2019 105

Figure 4.20 Top intra-African poultry importers, annual average 2010–2019 106

Figure 4.21 Top African exporters of meat and live animals to ROW, annual average 2010–2019 106

Figure 4.22 Top African exporters of dairy to ROW, annual average 2010–2019 107

Figure 4.23 Top origin countries of African livestock product imports, annual average 2010–2019 107

Figure 4.24 Top origin countries of African meat and live animal imports, annual average 2010–2019 108

Figure 4.25 Top origin countries of African dairy imports, annual average 2010–2019..... 109

Figure 4.26 Top origin countries of African poultry imports, annual average 2010–2019 109

Figure 4.27 African countries importing more than US$10 million in livestock products, annual average 2010–2019 110

Figure 4.28 Top 10 destinations for African livestock product exports, annual average 2010–2019 111

Figure 4.29 Top global importers of African meat and animal products, annual average 2010–2019 112

Figure 4.30 Top global importers of African dairy products, annual average 2010–2019 113

Figure 4.31 Top global importers of African poultry products, annual average 2010–2019 113

Figure 4.32 Tariffs on livestock products, 2016 (%)..... 114

Figure 4.33 Tariffs imposed on meat products, 2016 (%)..... 115

Figure 4.34 Tariffs imposed on poultry products, 2016 (%) 116

Figure 4.35 Tariffs imposed on dairy products, 2016 (%) 116

Figure 4.36 Intra-African tariffs imposed on meat, 2016 (%) 117

Figure 4.37 Intra-African tariffs imposed on poultry, 2016 (%) 118

Figure 4.38 Intra-African tariffs imposed on dairy, 2016 (%) 118

Figure 4.39 Number of nontariff measures imposed by EU and US in the agriculture sector, 2018 119

Figure 4.40 Ad valorem equivalent of SPS measures (%) 120

Figure 4.41 Ad valorem equivalent of TBT measures (%) 121

Figure 4.42 Shared suitability for pastoralism and agriculture, with number of conflict events, 1989–2018 124

Figure 5.1 Total COVID-19 deaths per million people vs. GDP per capita, February 2021 (logarithmic scales) 137

Figure 5.2 Average of COVID-19 Government Response Index by continent 138

Figure 5.3 Average of COVID-19 Containment and Health Index by continent 139

Figure 5.4 Average of COVID-19 Economic Support Index by continent 140

Figure 5.5 Comparison of African countries in terms of Containment and Health Index and Economic Support Index, average from March 1, 2020, to February 24, 2021 140

Figure 5.6 Closure of land borders in Africa, March 2020 141

Figure 5.7 Number of countries with food-related export restrictions in 2020 (left axis) and share of global trade in calories affected by these restrictions (right axis) 143

Figure 5.8 Sub-Saharan Africa current account as share of GDP, 2018 (%) 144

Figure 5.9 Rate of variation of average commodity prices between 2017–2019 and 2020 (%) 145

Figure 5.10 Terms of trade variation in Africa, 2020 (%) 146

Figure 5.11 Real effective exchange rates in selected African countries and RECs (Jan. 2019 =100) 148

Figure 5.12 Air and sea transportation costs (Jan. 2020 = 100) 149

Figure 5.13 Kenyan cut flower exports, 2020 ('000 metric tons) 150

Figure 5.14 Volume index of total trade, seasonally adjusted (100 = 2010 Q1) 151

Figure 5.15 Trade of CILSS products (by value) between Benin, Burkina Faso, Ghana, and Togo, 2018–2020 (US$ millions) 152

Figure 5.16 Trade volume index of cereals in eastern Africa, 3-month moving averages (100 = January 2014) 153

Figure 5.17 Trade value at three border posts in Uganda (US$ million) 153

Figure 6.1a Sectoral contributions to GDP, 2000–2019 average (%) 168

Figure 6.1b Agriculture value added, 2003–2019 (% of GDP) 169

Figure 6.2 Global Food Security Index, 2019 169

Figure 6.3 AMU trade flows of goods by region 170

Figure 6.4 Evolution of AMU countries' exports of agricultural and nonagricultural products, 2003–2019 (US$ billions) 170

Figure 6.5 Evolution of trade among the AMU countries, 2003–2019 (US$ millions) 171

Figure 6.6 Intra–AMU trade in agricultural products, 2003–2019 (US$ millions) 172

Figure 6.7 Agricultural exports to AMU, Africa, and EU, 2003–2019 average (US$ millions) 173

Figure 6.8 Agricultural imports from the AMU, Africa, and EU, 2003–2019 average (US$ millions) 173

Figure 6.9 Top 10 agricultural products traded within the AMU, average exports 2003–2019 (current US$ million) 174

Figure 6.10 Top 10 agricultural products traded by AMU countries with extra-AMU countries .. 175

Figure 6.11 Level of water stress, 2014 178

Figure 6.12 Bound and applied MFN Tariffs in AMU countries, 2019 (%) 180

Figure 6.13 Tariffs faced and imposed by AMU countries, 2016 (%) 182

Figure 6.14 Highest tariffs imposed by main trade partners on AMU countries, 2016 (%) 183

Figure 6.15 Nontariff measures on exports and imports in AMU countries, 2017 185

Figure 6.16 Technical vs. nontechnical nontariff measures in AMU countries, 2017 186

Figure 6.17 Ad valorem equivalents of technical and nontechnical measures faced by AMU exports to the EU and US, 2016 (%) 188

Figure 6.18 Number of nontariff measures faced by AMU countries in different destinations (%) 188

Figure 6.19a Maritime connectivity between the AMU and other regions 190

Figure 6.19b Maritime connectivity to the world by region 190

Figure 6.19c Maritime connectivity to the world, by AMU country 191

Figure 6.20a Time to export/import by AMU country (hours) 192

Figure 6.20b Cost to export/import by AMU country (US$) 192

Figure 6.21a Time to export/import by region in 2020 (hours) 193

Figure 6.21b Cost to export/import by region in 2020 (US$) 193

Figure 6.22 Quality of infrastructure in AMU countries, 2018 194

Figure 6.23a Corruption and property rights in AMU countries, 2018 195

Figure 6.23b Competition in AMU countries, 2018 196

ACRONYMS AND ABBREVIATIONS

AATM	Africa Agriculture Trade Monitor
AfCFTA	African Continental Free Trade Area
AGOA	African Growth and Opportunity Act (US)
AMU	Arab Maghreb Union
AU	African Union
AVE	ad valorem equivalent
DRC	Democratic Republic of the Congo
CAADP	Comprehensive Africa Agriculture Development Programme
CIF	cost, insurance, and freight
CILSS	Comité Inter-Etats de Lutte contre la Sècheresse au Sahel (Permanent Inter-state Committee for Drought Control in the Sahel)
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
EBA	Everything But Arms (EU)
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FOB	free on board
FSNWG	Food Security and Nutrition Working Group
FTE	full-time equivalent
GDP	gross domestic product
HS	Harmonized System
ICBT	informal cross-border trade
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
kcal	kilocalorie
LDC	least-developed country
LSBCI	Liner Shipping Bilateral Connectivity Index
LSCI	Liner Shipping Connectivity Index
MENA	Middle East and North Africa
MFN	most-favored nation
NTM	nontariff measure
OECD	Organisation for Economic Co-operation and Development
PPP	purchasing power parity
R&D	research and development
RCA	revealed comparative advantage
REC	regional economic community
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
ROW	rest of world
SACU	Southern African Customs Union
SADC	Southern African Development Community
SME	small and medium enterprises
SPS	sanitary and phytosanitary
TBT	technical barrier to trade
UAE	United Arab Emirates
UNCTAD	United Nations Conference on Trade and Development
WITS	World Integrated Trade Solution
WTO	World Trade Organization

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FOREWORD

2021 has brought enormous challenges as well as opportunities for Africa's agricultural trade. The COVID-19 pandemic continued to affect human health and welfare as well as economic activity in Africa and around the globe. 2021 also marked the launch of trading under the African Continental Free Trade Area (AfCFTA) agreement, which offers great potential to increase the contribution of intra-African trade to income growth and poverty reduction.

As was proposed in last year's edition, the *2021 Africa Agriculture Trade Monitor* (AATM) looks in depth at the impact of COVID-19 on African agricultural trade and overall economic performance. The report finds that the measures undertaken by African governments to limit the spread of the disease may have contributed to Africa's relatively low illness and mortality rates, but had significant adverse impacts on African agricultural trade. Movement restrictions and border closures particularly affected small-scale informal trade, which is an important source of income for many households and contributes to regional food security. Concerning policy responses on agricultural trade, international cooperation has been relatively better than during the 2007–2009 food-price crisis. However, trade disruptions during the pandemic underline the need to further coordinate policies across borders to ensure the continued functioning of markets.

The launch of trading under the AfCFTA was delayed by the COVID-19 pandemic, but officially began on January 1, 2021, marking a milestone in Africa's regional trade integration. The AfCFTA comprises an area with a population of 1.2 billion and a combined GDP of around US$3 trillion. Countries ratifying the AfCFTA have committed to liberalizing 90 percent of their tariff lines, with varying timelines depending on level of economic development, leading to positive gains for trade, growth, and poverty reduction. However, ex ante analyses of AfCFTA impacts agree that tariff reduction is not sufficient to bring major benefits in terms of income gains and poverty reduction; tariff liberalization must be combined with reductions in nontariff measures as well as policies to address the high costs of trade. For example, the efficiency of customs procedures must be significantly improved.

Against this backdrop, the COVID-19 pandemic and the launch of trading under the AfCFTA both underscore the pressing need to improve the availability and quality of agricultural trade data in Africa, especially data on informal cross-border trade. Access to timely and accurate data is vital to monitor the effects of shocks (such as the current pandemic) and to anticipate and plan responses to food crises. Moreover, the AfCFTA will require detailed trade data (at the firm level for instance) to guide implementation and to monitor early impacts to allow for course corrections if necessary.

As in prior editions, this fourth edition of the AATM provides improved trade statistics, using consistent indicators to monitor trends in Africa's participation in global trade as well as the status of intra-African trade. The report finds that African countries' comparative advantage in global agrifood markets remains largely concentrated in unprocessed products. However, processed products constitute a growing share in intra-African agricultural trade. Strategies to facilitate trade in processed foods will be essential to accelerate this growth, link producers to growing urban markets, and achieve the Malabo Declaration goal of tripling intra-African trade by 2025.

The report also examines a number of special topics. In addition to devoting a chapter to the impacts of COVID-19 on African trade, the 2021 AATM also carries out a detailed analysis of trends and policy issues in the meat, poultry, and dairy value chains. As every year, the AATM also studies one of the regional economic communities. This year's report examines trade integration in the Arab Maghreb Union (AMU).

The next issue of the AATM will clearly have to assess the effects of the AfCFTA on African trade in agriculture, growth, and economies more broadly. As for the regional economic communities, the Economic Community of Central African States (ECCAS) may be featured in 2022.

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EXECUTIVE SUMMARY

In Africa, trade and development depend heavily on progress in the agriculture sector. While African countries have diversified both their exports and trade partners over the last decade, African agricultural trade still suffers from structural and cyclical problems. Critical structural issues, which include low-quality goods, poor infrastructure, low productivity, costly nontariff measures, and water stress, must be addressed to improve Africa's competitiveness and increase African trade. Cyclical problems related to exogenous shocks, such as the decline in oil prices and the pandemic, also affect trade in general and agriculture in particular. Against this backdrop, the *2021 Africa Agriculture Trade Monitor* (AATM) analyzes continental and regional trends in African agricultural trade flows and policies, with a focus on the impact of the pandemic at both the macroeconomic and microeconomic levels. The major findings from the report's six chapters are summarized below.

The pandemic and the implementation of the African Continental Free Trade Area (AfCFTA) were the key events affecting African trade in 2020 and 2021. These two important developments have presented a critical challenge and an unprecedented opportunity. While the recessionary impact of the pandemic has led to lower growth rates, rising poverty, and reduced trade flows, the AfCFTA represents an opportunity for significant gains at both the regional and continental levels. To fully seize this opportunity, the tariff liberalization accomplished in this first stage is a necessary step, but not sufficient. There is broad agreement on the need to improve Africa's infrastructure and address nontariff measures that continue to erode Africa's external competitiveness.

While Africa has long been an important exporter of cash crops and niche products, most African economies have not diversified; they continue to export either exclusive or standard products. Chapter 2 of the 2021 AATM characterizes African trade using three different approaches. First, it examines the comparative advantages of the African continent in agriculture and finds that Africa has enjoyed most success with cash crops (coffee, cocoa, tea, and cotton) and niche products (cashew nuts, kola nuts, vanilla, sesamum seeds, locust beans, etc.) in recent years. Second, this chapter identifies four groups of countries globally, based on a two-part classification of countries (diversified or nondiversified) and of export products (standard or exclusive). Only two African countries, South Africa (in 2003–2005) and Egypt (in 2017–2019), have come close to those with a high diversification index globally. All other African economies are classified as nondiversified countries producing either standard or exclusive products. Third, the chapter investigates trade as measured in calories and in terms of resources embedded in traded products. Trade in calories (kcal/person/day) is a key variable used for measuring and evaluating the global food situation. Only five African countries have a positive trade balance in calories: Mauritius, Côte d'Ivoire, Zambia, Malawi, and Uganda. The other 47 countries must import calories, and of these, Djibouti has the largest calorie deficit per person. In terms of the embedded water content (virtual water) of traded products, many African countries that were chiefly net exporters of water in 1986 had become net water importers by 2010.

At the intra-African level, several products continue to be traded largely among clusters of countries, with a trivial share sold outside the cluster. Chapter 3 focuses on 10 products important to the continent's food system: four cereals and pulses (rice, maize, wheat, and beans), three vegetables (potatoes, onions, and tomatoes), and three fruits (bananas and plantains, citrus fruit, and apples). At the continental level, the share

of intra-African imports in total African imports is low for cereals, but high for tomatoes and citrus fruit. A network analysis presented in this chapter is used to examine the extent of trade regionalization in Africa. It shows that intra-African trade networks for the 10 products evolved significantly over the 2003–2019 period, with the average number of countries active in trade for each product ranging from 44 to 54. The network analysis also shows that the number of trade links between African countries increased significantly during the period, implying that African countries are becoming more connected for the studied commodities. However, there is a huge number of potential but unexploited trade relationships, as measured by the density of the networks (the number of actual trade links over the number of potential links) for the selected commodities. A further analysis of the centrality (assortativity) of the links in the networks indicates that intra-African trade for the selected commodities is not yet decentralized.

Despite its important role in Africa, the livestock sector is concentrated in low value-added products that are informally traded. Every year, Chapter 4 of the AATM focuses on specific value chains. This year, it examines the defensive interest of Africa in three value chains that are critical for food security and nutrition: meat and animals, dairy, and poultry. The chapter shows that, first, greater effort is needed to collect data on informal trade, given that significant intra-African trade in livestock is conducted in informal markets. Second, intracontinental livestock trade occurs primarily among southern and eastern African countries, plus Libya and Egypt. Third, although African countries benefit from preferential trade access in the United States and European Union through the African Growth and Opportunity Act (AGOA) and Everything But Arms (EBA) schemes, respectively, they face cumbersome nontariff measures, especially sanitary and phytosanitary measures and technical barriers to trade. African livestock sectors are also relatively less productive than other global producers, limited in part by low investment in livestock infrastructure and coordination. When the trade-inhibiting effects of domestic support to OECD-country agriculture are added to NTMs and Africa's low investment in the livestock sector, it seems unlikely that African farmers could be competitive in world markets for meat, dairy, or poultry.

Quantifying the effect of COVID-19 in Africa shows that the health impacts have been relatively small, and the economic impacts more pronounced. Chapter 5 uses a computable general equilibrium (CGE) model to quantify the pandemic's impact on African economies. The simulation shows that the economic impact has been smaller than initially expected, primarily because the health impact has been less severe than originally estimated. Furthermore, agricultural production has remained relatively stable and costs are down, reflecting the drop in prices for manufacturing and services. This suggests that there is room for the agrifood sector to expand. The number of people in poverty is estimated to have increased by 50.5 million in 2020. Finally, by using household surveys and making informed assumptions about the impact of the shock on job and income losses, an assessment was made of the pandemic's socioeconomic impact in Ghana, Uganda, and Senegal. These simulations estimate that poverty incidence increased from 20.5 to 33.9 percent in Ghana, from 39.0 to 72.3 percent in Senegal, and from 18.9 to 26.8 percent in Uganda. To offset the negative effect of the pandemic, expansionary fiscal policies are needed. In Uganda, the shock could have been easily managed at a relatively low cost, but appropriate policies are expected to be more costly in Ghana and Senegal, given their limited fiscal space.

The Arab Maghreb Union (AMU) has implemented some trade liberalization, but its countries remain poorly integrated. Chapter 6, as in prior years, focuses on

intraregional trade integration within one regional economic community (REC), in this case the AMU. The five AMU countries — Algeria, Libya, Mauritania, Morocco, and Tunisia — trade mainly with the European Union. Only Morocco and Tunisia are net exporters of agricultural products within the AMU, while Libya and Mauritania are the only significant net importers. Despite the AMU trade liberalization agreement, AMU integration remains superficial due to several trade-related factors, most notably tariffs, nontariff measures, poor transport infrastructure, weak domestic institutions, and cumbersome customs procedures. Clearly, these issues must be addressed to deepen integration of this REC.

To move forward with expanding African trade, deeper and wider cooperation is needed for both data and policies. The pandemic highlighted the need to improve trade data at the continental level in two ways: first, by generating real-time data, and second, by increasing initiatives to measure informal trade (especially for the livestock sector). In terms of policy advances, three priorities must be considered by the AfCFTA: digitalization of the agriculture and agrifood sector; facilitating intra-African trade through infrastructure improvements and addressing nontariff measures to complement the tariff liberalization that took place in early 2021; and increasing cooperative trade policies in times of crisis.

Overview

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Photo by Victor Puente/Pexels

Chapter 1

INTRODUCTION

This is the fourth 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 (RECs). The AATM is supported by the United States Agency for International Development (USAID).

The 2020 AATM highlighted findings that offer hope, but also indicate a few vulnerabilities in Africa's participation in international agricultural trade. First, African exports to emerging and fast-growing countries are expanding — the share of Africa's agrifood exports going to the European Union (EU) decreased between 2005–2007 and 2016–2018, while exports to Brazil, China, India, and Russia increased. Second, there is room to expand intra-African trade by further opening countries to trade among RECs. Although agricultural trade within RECs is now relatively free, trade between RECs still faces significant impediments. Third, informal cross-border trade is substantial and plays a crucial role in poverty alleviation and food security; with informal trade included, intraregional trade as a share of Africa's total trade would be much higher. Many initiatives today aim to estimate the importance and describe the main features of this type of agricultural trade. This is good news, although the measurement effort should be operated systematically throughout the continent and incentives should be given to informal traders to formalize their activity. Fourth, nontariff measures (NTMs) and customs procedures are significant obstacles to increased participation of African economies in global agricultural trade. Fifth, food demand is changing qualitatively and quantitatively as a result of demographic shifts, growing urban demand, and changing lifestyles and diet habits. African food supply chains are responding well to these emerging trends with increasing shares for processed food in intra-African trade.

With this background, the 2021 AATM uses a rigorous statistical approach and technically robust tools to focus on several issues related to Africa's trade integration. Chapter 2 provides a general overview of Africa's agricultural trade performance, including: shares of African trade in world flows by agriculture sectors, number of revealed comparative advantages (RCAs) by sector and processing stage, calorie content of African imports and exports, and main trade barriers affecting agricultural exports, complemented by a new estimation of the importance of NTMs in Africa and in the main destination markets for African exports. The chapter also provides an overview of African trade in agricultural resources — fertilizers and pesticides, labor, and water content of African agricultural exports and imports.

Chapter 3 investigates intra-African trade integration, with a focus on 10 primary products from the groups of cereals and pulses (rice, maize, wheat, and beans), vegetables (potatoes, onions, and tomatoes), and fruits (bananas and plantains, citrus fruit, and apples) that are important from a food security perspective. It presents the trends and patterns in total intra-African agricultural trade, in general and for selected products, and analyzes these trends using network tools, before focusing on tariffs and NTMs.

Chapter 4 examines value chains in Africa. While the 2019 AATM looked at traditional cash crops and recently well-performing value chains, including citrus, grapes, legumes and pulses, sesame seeds, and tomatoes, the 2020 report focused on crop-based value chains where African economies have a defensive interest: major cereals (wheat, maize, rice) and cassava, sugar, and vegetable oils. In 2021, we focus on African competitiveness in animal-based value chains where

the continent has a defensive interest: meat and animals, dairy, and poultry. For each of these value chains, we examine both trade flows and trade policies (tariffs and NTMs). Importantly, informal trade continues to play a major role in these value chains, and there is little high-quality data available, especially for intra-African trade.

The impact of the COVID-19 crisis on Africa and on agricultural trade in the region is assessed in Chapter 5. The chapter presents the channels of transmission of the world crisis to Africa, explains how sanitary and health policy reactions have deepened the economic crisis, and offers estimates of its impact in terms of trade, GDP, and poverty.

Chapter 6 of the AATM is usually dedicated to analysis of a specific region within Africa. The Southern African Development Community (SADC) was studied in the 2020 AATM, the Common Market for Eastern and Southern Africa (COMESA) was analyzed in the 2019 AATM, and the Economic Community of West African States (ECOWAS) was featured in the 2018 AATM. This year's report focuses on northern Africa, with a special focus on the Arab Maghreb Union (AMU).

This first chapter provides an overview of recent issues related to agricultural trade in Africa. Hence, the next section explains how the unprecedented shock of COVID-19 has had a major impact on trade and food security in Africa. The following section looks at the initial steps in the implementation of the African Continental Free Trade Area (AfCFTA) in 2021. The final section describes some issues concerning data and methodology used for this report.

AFRICA AND COVID-19

The world's first cases of COVID-19 were detected in China at the end of 2019, but the first African death was not recorded until February 2020. As of mid-June 2021, 175.29 million cases (2.2 percent of the world population) and 3.77 million deaths (0.05 percent) had been confirmed worldwide. At that time, 5.02 million cases had been identified and 135,003 deaths confirmed in Africa. These figures are relatively low compared with the rest of the world, as they represent 0.4 percent and 0.01 percent of the African population, respectively.

Although much remains to be understood about the virus, its spread, and associated mortality, several convincing reasons have already been advanced to explain its relatively limited impact on the African continent. Among these is the generally rapid adoption of sanitary and health measures by African governments. Safety measures adopted in Africa, and worldwide, include social distancing, lockdowns, and restrictions on gatherings, as well as border measures. However, these health and safety measures have deepened the economic crisis in Africa that was initiated by the COVID-19 crisis in other parts of the world through the global fall of energy and metal prices, the decline in remittances, and the collapse of tourism revenues.

A few of the measures designed to stop the spread of the pandemic have had far-reaching impacts on African food value chains and the livelihoods of many households. These impacts differ substantially across sectors, countries, value chains, and households. For example, production of cereals and other crops in large farms has generally been significantly less affected because these sectors are not labor-intensive — operations are mechanized and often located in areas with dispersed populations. Production of fruits and vegetables, however, which is usually labor-intensive, has suffered larger impacts (Glauber et al. 2021).

"Transitional" supply chains predominate in Africa, accounting for 50 to 80 percent of the food supply (Reardon, Bellemare, and Zilberman 2020). They are characterized by large numbers of small and medium enterprises (SMEs) engaged in food processing, many meal vendors at truck stops, and masses of wholesalers and retailers in marketplaces and wet markets. These supply

chains have been especially hard hit by safety measures, including lockdowns and restrictions on gatherings and public open markets. "Modern" value chains, which are more capital-intensive and notably more flexible in terms of input supplies and marketing channels, have consequently been less affected by the pandemic (Reardon, Swinnen, and Vos 2021).

In Senegal, in the fresh fruit and vegetables sector, the modern value chain is vertically integrated and composed of large modern firms exporting the entirety of their production; these enterprises have not been significantly affected by the pandemic. The transitional value chain for these products is composed of small firms that work in a poorly integrated domestic market; these operations have been severely affected by economic measures adopted by Senegal's government (Reardon, Swinnen, and Vos 2021). In Ethiopia, the impact of the shock differed greatly from one agricultural product to another. Although marketing costs do not seem to have played an important role, impacts on different product value chains were shaped by the degree of openness to international competition and the reaction of local demand, which varied by product (Hirvonen et al. 2021).

Informal cross-border trade is a key economic activity in Africa, and includes cross-border trade of small quantities (often of agrifood products) operated by individuals, especially women. In many African countries, cross-border trade by individuals was forbidden in 2020 (see Chapter 5), while cross-border trade by trucks was slowed by sanitary controls and curfews that caused significant waste of fresh food products. In Uganda, for example, informal trade dropped by 78 percent in 2020 compared with 2019, while formal trade decreased by only 16 percent (UBoS 2020). In West Africa, trade recorded by the Comité Inter-Etats de Lutte contre la Sècheresse au Sahel (CILSS, Permanent Interstate Committee for Drought Control in the Sahel) between April and September 2020 was 85 percent below the same period in 2018.

Overall, however, the economic crisis has been less severe in Africa than in the rest of the world. According to the IMF's latest estimates, delivered in April 2021, global real GDP fell by 3.3 percent in 2020 while sub-Saharan Africa's GDP fell by 1.9 percent, performing better than Latin America and the Caribbean (−7.0 percent), but worse than developing Asia (−1.0 percent) (IMF 2021).

Nevertheless, three caveats temper this rather optimistic view of Africa in 2020. First, a decrease by 1 percent, for example, of national income is a bigger concern for a poor nation than for a rich one. In this vein, the GDP decline of 1.9 percent is very bad news in Africa, where social transfers and economic support measures for the poor are limited.

Second, the 1.9 percent decline is the change in total GDP in real terms. But as Africa's population grew by 2.5 percent in 2020, the decline in real GDP per capita was much larger, reaching −4.3 percent.

Third, as we have noted, the impact of the crisis has been highly differentiated by country, economic sector, and income level. It is likely, therefore, that relatively vulnerable populations — including informal cross-border traders, women, and SME owners and employees — have suffered the largest impacts of the crisis.

Moreover, Africa's recovery may be relatively slow. After the rapid development of coronavirus vaccines, the world's vaccination campaign began in early 2021. As of mid-June, 20.8 percent of the world population had received at least one dose. However, most vaccines have been administered in rich countries. In Africa, COVID-19 vaccine doses administered stood at 3.16 per 100 people, in contrast with 31.0 worldwide, 92.9 in the United States, and 67.6 in the EU. (OurWorldinData; accessed June 14th, 2021).

Even more problematic is the continued slow pace of vaccination in mid-2021. As the daily number of vaccine doses administered per 100 people reached 0.42 worldwide, 0.33 in the United States, and 0.79 in the EU, Africa is way behind at only 0.04 as a result of insufficient supply and low capacity for implementation. In June 2021, the G7 announced the donation of a billion doses to poor and middle-income countries. However, many poor countries lack the necessary infrastructure and technical capacity to conduct mass immunizations (de Bolle 2021). With delayed vaccinations, the negative effects of health measures — such as the impact of school closings (especially significant where there is little access to computers and the Internet) — may persist longer in Africa, with a greater impact on long-term growth.

The pandemic has exposed both significant fragility and resilience in African agricultural trade: fragility of cross-border trade by individuals operating with small quantities and of labor-intensive national or regional value chains composed of many SMEs; and resilience of modern, vertically integrated, capital-intensive value chains engaged primarily in exports.

IMPLEMENTATION OF THE AFCFTA

Among the important recent developments in Africa is the implementation of the African Continental Free Trade Area (AfCFTA). This is considered a critical landmark of the Abuja Treaty (1994), which included six integration phases as follows: phase 1 (5 years) strengthening existing RECs and creating new RECs in other African regions; phase 2 (8 years) ensuring coordination within each REC by eliminating tariffs and NTMs; phase 3 (10 years) creating a free trade area or customs union in each REC; phase 4 (2 years) harmonizing tariff and nontariff systems among the RECs with the aim of creating a continental customs union; phase 5 (4 years) creating an African common market; and phase 6 (5 years) establishing an African economic community with a monetary union and an African parliament.

For the AfCFTA itself, negotiations have three major phases: a first phase consisting of the liberalization of trade in goods and services and the rules and procedures for settling disputes; a second phase dealing with the protocol on intellectual property, investment, and competition rights; and a third phase concerning electronic commerce. After five years of negotiations, 54 countries have now signed and 36 have ratified the AfCFTA agreement (as of April 2021), concluding the first AfCTA phase and creating the world's largest free trade area. Free trade officially began on January 1, 2021. With the implementation of the AfCFTA, ratifying countries must remove tariffs on 90 percent of imported products, with least developed countries (LDCs) liberalizing their trade over a 10-year period and non-LDCs over a 5-year period. In addition, 7 percent of tariff lines that are related to sensitive products will be liberalized over 13 years for LDCs and 10 years for non-LDCs, and 3 percent of tariff lines will be excluded from tariff liberalization.

Several studies have provided an ex ante analysis of the potential impact of the AfCFTA, most using computable general equilibrium (CGE) models. These studies converge on the finding that decreasing or ultimately removing tariffs is necessary but not sufficient to achieve significant gains. However, the final result of reducing tariffs plus addressing NTMs and reducing time-in-transit costs is likely to generate important gains for Africa by reducing market distortions. Jensen and Sandrey (2015) argue that reducing tariffs alone will increase Africa's GDP by 0.6 percent; when NTMs are also reduced, GDP increases by 1.5 percent. In the same vein, Chauvin et al. (2016) confirm these findings but with greater gains: a 1.3 percent increase in GDP when tariffs are reduced, and 5 percent when both tariffs and NTMs decrease. Moreover, Abrego et al. (2019) show that with a 35 percent reduction in NTMs, welfare (real income) increases by 2.6 percent for sub-Saharan Africa and 2.1 percent for the whole continent. More recently, the

World Bank (2020), using a multinational CGE model combined with a global microsimulation framework (Global Income Distribution Dynamics [GIDD]), shows that real income gains from full implementation of the AfCFTA could reach 7 percent by 2035 (US$450 billion in 2014 prices). Like the other estimates, the World Bank study finds that tariff liberalization would lead to real income gains of about 0.2 percent at the continental level. However, when NTMs are reduced, real income gains reach 2.4 percent in 2035. At the microeconomic level, the study argues that the AfCFTA can help 30 million people escape extreme poverty and 68 million people escape moderate poverty.

Based on these studies, it is clear that tariff liberalization alone will yield positive outcomes, but additional measures are needed for a greater impact. While the tariff negotiations in the AfCTA's first phase have been fairly successful, more efforts are needed in the short term to address infrastructure needs and NTMs. First, improvements are needed in African ports and roads to facilitate the transport of goods and speed the clearance processes for traded goods. Second, reducing the burden of NTMs (especially sanitary and phytosanitary measures, rules of origin, technical barriers to trade, and other para-tariff measures) is indispensable to improving the competitiveness of African exports.

These ex ante studies of the AfCFTA's impact provide some important projections. However, two issues must be highlighted. First, an ex post analysis of the first year of free trade implementation is crucial to evaluate the short-term effect of the agreement. Second, as is shown in this report, formal trade data do not accurately reflect exports and imports in several sectors (especially the livestock sector). Incorporating informal cross-border trade into both trade statistics and modeling would provide a more accurate assessment of the AfCFTA. Indeed, removing tariffs may reduce consumer prices and thus discourage some of the informal trade that is primarily undertaken by the poorest segments of the population.

ISSUES CONCERNING DATA AND METHODOLOGY

To monitor trade in agriculture, the AATM relies heavily on trade statistics. High-quality statistics are fundamental for good policy recommendations. Better data are particularly needed for agricultural trade in Africa, where international trade statistics are often 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 2020 AATM report, the 2021 release is based on an original dataset constructed to provide better statistics on global and African trade. This analytical database was developed with the support of the CGIAR Research Program on Policies, Institutions, and Markets (PIM), and 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 was included in the 2021 edition of the dataset; we include only the data on the livestock sector in Chapter 4, given its relevance).

In the first step, the data are harmonized and cleaned. Trade flows of less than US$1,000 at the product and bilateral level 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 (records from exporting and importing country). Instead of averaging the two declarations, a series of checks aimed at identifying the most reliable declaration is conducted.

First, export/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. The remaining trade flows are selected based first on the importer declaration, which is considered most reliable, then if not available or 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.

THE WAY FORWARD

While the AATM data are more accurate and provide a clearer picture of agricultural trade than other datasets, more extensive and higher-quality data are required to better assess and monitor recent trade developments. Current data can be improved in four ways. First, the pandemic has shown the importance of having real-time data published by governments and international organizations. Such data can support a more rapid and timely evaluation of the impact of crises (especially the pandemic) on economic activity, trade, poverty, and food security. Second, and especially in Africa, including informal cross-border trade data should be a priority for governments and international organizations. In fact, Little (2005) reported that unofficial exports of commodities such as livestock to neighboring countries exceed official statistics by a factor of 30 or more. Third, customs data on African exporters must also be available and harmonized across countries in order to examine how exporters in general, and particularly agricultural exporters, are affected by different shocks. Lastly, it is essential to develop surveys assessing the effect of NTMs and behind-the-border measures on both exports and imports (given that most of the data available are related to imports only). Exporters often face onerous requirements in their country of origin that may exceed the requirements in destination countries.

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AFRICAN PARTICIPATION IN GLOBAL AGRICULTURAL TRADE

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Chapter 2

INTRODUCTION

The reasons for the limited participation of African countries in international trade continue to be heavily debated in both academic and policy arenas. Previous Africa Agriculture Trade Monitor (AATM) reports suggest that Africa has not reached its potential in terms of global agricultural trade, but some figures are encouraging. Although Africa's comparative advantage for a few agricultural commodities — including cashew nuts, cut flowers, sesame seeds, and vanilla — has strengthened in recent years, the 2019 AATM report concluded that African countries are still too specialized in raw and semiprocessed products. The report also found that the main obstacles to Africa's greater participation in global agricultural trade are nontariff measures (NTMs) and customs formalities. The 2020 AATM report confirmed this, but also highlighted the growing diversification of destinations for African agricultural exports, with an increasingly smaller share going to the European Union (EU) and a growing share going to emerging and high-growth economies.

Combining analyses at the aggregate and sectoral levels offers the richest perspective for understanding Africa's place in global agricultural trade. International economic theory tells us that the intensity of trade depends on both macroeconomic factors (e.g., factor endowments, exchange rates) and sectoral factors (e.g., factor intensity by sector, access to specific technologies). In the same vein, the notion of "competitiveness" can be applied to a particular product, or to an entire economy.[1] Thus, in this chapter, we look at African participation in global agricultural trade both at an aggregated level and at the sectoral level, for eight important sectors: animals, plants, coffee, cereals, oilseeds, sugar, cocoa, and tobacco. This disaggregated view can help us identify the most promising sectors.

Because our focus is on agriculture sectors, we do not restrict our study to agrifood products; we include some nonfood products in the animals sector (hides, skins, leather, silk, wool, and related clothes) and the plants sector (cotton yarns, fabrics, and clothes made from cotton or other natural fibers). This extension to nonfood products is specific to this chapter and does not apply to other chapters of this report.

The following section provides an overview of African trade in agricultural goods, while the third section offers an overview of trade in resources. The fourth section offers explanations for Africa's weak performance, and the final section concludes.

AN OVERVIEW OF AFRICAN TRADE IN AGRICULTURAL GOODS

Our analysis covers eight groups (or sectors) of products, indicated in Table 2.1 (both by their full name and the shortened versions that we use throughout this chapter), along with the correspondence between sectors and chapters of the Harmonized System (HS).[2]

Our dataset begins in 2003, the year when African governments endorsed a declaration on "Agriculture and Food Security in Africa" at the African Union assembly in Maputo. This declaration committed African governments to allocating at least 10 percent of national budgetary resources to agriculture and rural development within five years.[3]

1 However, the competitiveness of an economy is a concept criticized by economists (see Krugman 1994, for the most famous criticism), especially when it refers to trade sold or share in world markets.

2 The complete correspondence between sectors and products at the disaggregated level (HS6) may be requested from the authors. HS6 is a product disaggregation adopted by all countries for trade. There are 5,204 products at the HS6 level, of which 710 are classified by the WTO as agricultural. At the second level of disaggregation, there are 23 agricultural chapters. Fish, crustaceans, and fish products (HS03) are not included in agricultural chapters.

3 The year 2003 was chosen because it is the first year in the AATM database.

Table 2.1 Distribution by sector of Africa's agricultural exports and imports, and of global trade, 2003–2019 average

Labels	Short names	HS (Harmonized System) chapters	Share in Africa's exports of these 8 sectors	Share in Africa's imports of these 8 sectors	Share in world trade of these 8 sectors
Live animals, meat, animal products (including animal fats) and preparation of meat	Animals	HS01, HS02, HS04, HS05, and parts of HS15, HS16, HS21, HS23, HS41, HS42, HS43, HS50, HS51, HS55, HS57, HS58, HS60, HS61, HS62, and HS63	13.2%	17.3%	26.3%
Plants, bulbs, roots, fruit and vegetables, preparations of vegetables, fruit, nuts or other parts of plants	Plants	HS06, HS07, HS08 and parts of HS11, HS12, HS13, HS14, HS21, HS23, HS52, HS53, HS55, HS56, HS57, HS58, HS60, HS62, and HS63	44.6%	20.6%	36.8%
Coffee, tea, mate and spices	Coffee	HS09 and part of HS21	6.9%	2.6%	3.1%
Cereals, products from the milling industry and preparations of cereals and products from the milling industry	Cereals	HS10, HS11 and parts of HS12, HS19, and HS23	4.3%	33.3%	12.2%
Oil seeds, oleaginous fruit, vegetable oils, and oilcakes	Oilseeds	Parts of HS12, HS15, HS21, and HS23	7.1%	14.1%	13.0%
Sugar and sugar confectionery	Sugar	HS17 and part of HS12	4.0%	7.4%	3.0%
Cocoa and cocoa preparations	Cocoa	HS18	14.7%	1.0%	2.7%
Tobacco and manufactured tobacco substitutes	Tobacco	HS24	5.3%	3.6%	2.9%

Source: Constructed from the 2021 AATM database.

African participation in global trade by sector

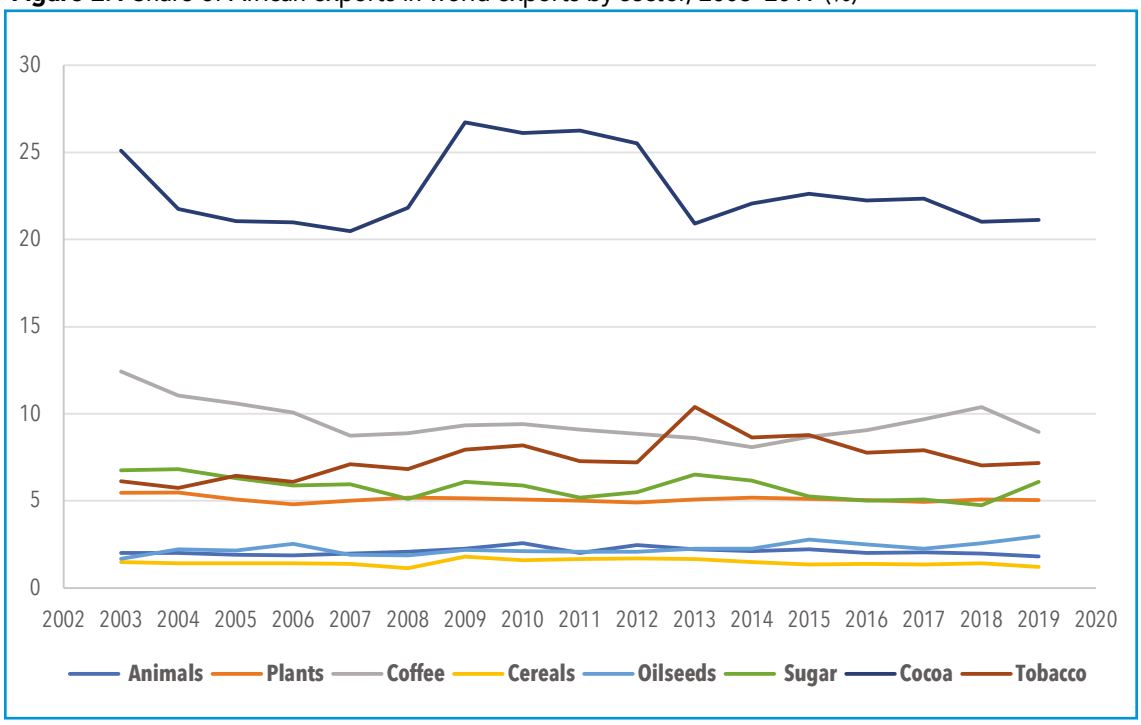
Global agricultural trade is driven by the plants sector, with an average share of 36.8 percent in the value of global agricultural trade between 2003 and 2019 (Table 2.1). However, for all eight sectors examined, the value of Africa's exports is a small share of the world's total exports: only 4.2 percent over the 2003–2019 period (this statistic is not presented in Table 2.1).

Africa's agricultural exports are largely from the plants sector, with a share of 44.6 percent. On the imports side, cereals are predominant, accounting for 33.3 percent of African imports from these eight sectors.

In relative terms, Africa's participation in world exports has been stable for most of these sectors (Figure 2.1). However, the share of Africa's cocoa exports in world cocoa exports has been relatively volatile, ranging from 20.5 to 26.7 percent during the period 2003–2019. In 2003, Africa's cocoa exports accounted for about a quarter of world trade, but this share decreased until the end of the decade, then made a noticeable recovery between 2008 and 2012. This volatility is attributable to Africa's specialization in cacao beans; when we take into account fluctuations in world prices for cacao beans — which peaked in 2003 and again in 2009–2011 and 2015[4] — the African share in world exports is in fact relatively stable.[5]

The picture is similar for coffee, sugar, and tobacco, while plants show a relatively stable trend in participation rate. Africa's share in world coffee exports experienced a long period of decline after 2003, followed by a recovery since 2014, despite a decline in 2019.

Figure 2.1 Share of African exports in world exports by sector, 2003–2019 (%)



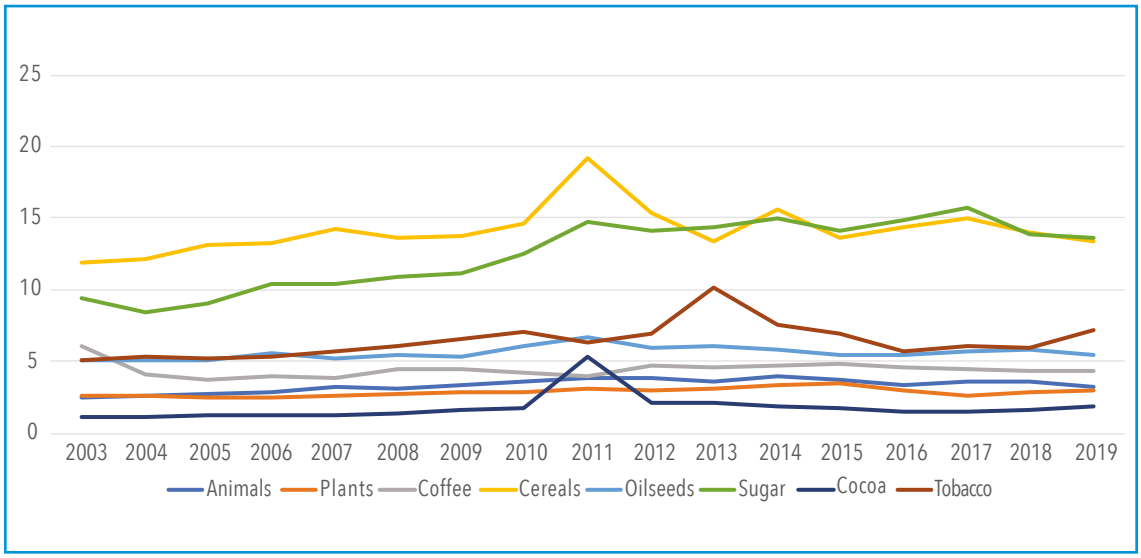
Source: Constructed from the 2021 AATM database.

Africa's participation in world imports is shown in Figure 2.2 for the eight agricultural groups. The continent's share in global imports is highest for cereals, where a significant increase is apparent from 2003 to 2011. In all sectors except tobacco, Africa's share stabilized from 2011 to 2019. The increase in imports in 2011 reflects the severe drought that affected the entire East Africa region from mid-2011 to mid-2012. This was likely the worst drought since 1950 (Headey and Kennedy 2012); food insecurity reached emergency levels in Kenya and Ethiopia and famine was declared in Somalia.

4 https://www.indexmundi.com/fr/matieres-premieres/?marchandise=feves-de-cacao&mois=180; accessed May 6, 2021.

5 Political developments also had an influence: Côte d'Ivoire is one of the main exporters, and between 2003 and 2019 there has been repeated political unrest in this country, which can be expected to have affected cocoa exports.

Figure 2.2 Share of African imports in world imports by sector, 2003–2019 (%)



Source: Constructed from the 2021 AATM database.

Comparative advantages

Measures of revealed comparative advantage (RCA) are used to assess which products a country or a region is best at producing and exporting, relative to other products it could export and to other countries or regions. When this indicator is greater than one, we consider that this country has a revealed comparative advantage in the product; when it is less than one, it has a revealed comparative disadvantage.

We note that the RCA only reflects the comparative advantage of a country in the current policy environment. For example, a country may be strongly competitive in maize production, but if there is an export ban in effect for maize, maize will not be revealed as having a comparative advantage. In other words, the RCA reveals a comparative advantage based on observed trade flows, without consideration of whether the advantage is attributable to access to technology, to specific endowments, or to a domestic policy that gives an advantage to local producers. Interestingly, Ricardo's theory attributes differences in export performance to sectoral technological advantages ("innate productivity") on the exporter side. To calculate real comparative advantage on a sound theoretical basis, trade flows should be purged of all other factors than innate productivity that may explain their values. In practice, while comparative advantage should be solely based on a sector's innate productivity in the exporting country, trade flows reflect many other factors, such as historical relations. For example, the role of history is illustrated by the importance of Côte d'Ivoire's exports of cacao beans to France. This approach to measuring comparative advantage is clearly interesting, but it involves a time-consuming econometric estimation that cannot be undertaken here.[6]

In this chapter, we focus on continental competitiveness in the world market. Country competitiveness will be addressed in Chapter 4. We also take all agricultural products as a reference, rather than all products. The RCAs are computed at the level of the African continent by dividing the share of a product in African agricultural exports by the share of the same product in world agricultural exports.

6 To purge trade flows from all other factors than innate productivity, Leromain and Orefice (2014) estimate an equation of exports of product k from country r to country s on a country-pair fixed effect (r,s), an importer-industry fixed effect (s,k), and an exporter-industry fixed effect (r,k), the latter being used to estimate the innate productivity.

Table 2.2 presents the average number of HS6 lines with African RCAs for each of eight sectors, comparing the average number for 2017–2019 with 2003–2005. As the number of HS6 products is different for each sector, Table 2.2 also indicates the percentage of HS6 products in this sector for which Africa has a comparative advantage, as revealed by the calculation of RCAs.

Table 2.2 Number and share of African RCAs at the HS6 level for each of 8 sectors, 2017–2019 and 2003–2005 averages

	Name	Animals	Plants	Coffee	Cereals	Oilseeds	Sugar	Cocoa	Tobacco
2017–2019	*Number of RCAs*	96	169	19	18	36	9	8	7
	% of sectoral RCAs	26.4%	33.1%	44.2%	24.7%	40.9%	45.0%	72.7%	70.0%
2003–2005	*Number of RCAs*	105	190	21	22	33	9	7	5
	% of sectoral RCAs	28.9%	37.3%	48.8%	30.1%	37.5%	45.0%	63.6%	50.0%

Source: Constructed from the 2021 AATM database.

The total number of Africa's RCAs for these eight sectors decreased from 392 in 2003–2005 to 362 in 2017–2019. Over this period, the number of RCAs per sector declined in the product groups animals, plants, coffee, and cereals; it increased slightly in the groups oilseeds, cocoa, and tobacco and remained stable in sugar. The largest number of African RCAs belong to the plants group, while in relative value, Africa has been most frequently competitive in cocoa on world markets.

Table 2.2 is instructive as it shows how many RCAs Africa has lost and gained in less than 20 years. For illustration, Africa lost 66 RCAs in the plants group but gained 45 in the same group over the period, for a net loss of 21 RCAs.

The level of an RCA is also informative; this "bi-ratio" indicates the importance of a product in a country's exports compared with the world average — the higher the bi-ratio, the more important the product. Table 2.3 shows the 30 highest African RCAs for 2017–2019 in these eight sectors. It also indicates two shares for each product: the share of Africa in world exports of this HS6 product and the share of the HS6 product in total African exports.

Table 2.3 Top 50 RCAs for agricultural products in Africa, 2017–2019 average

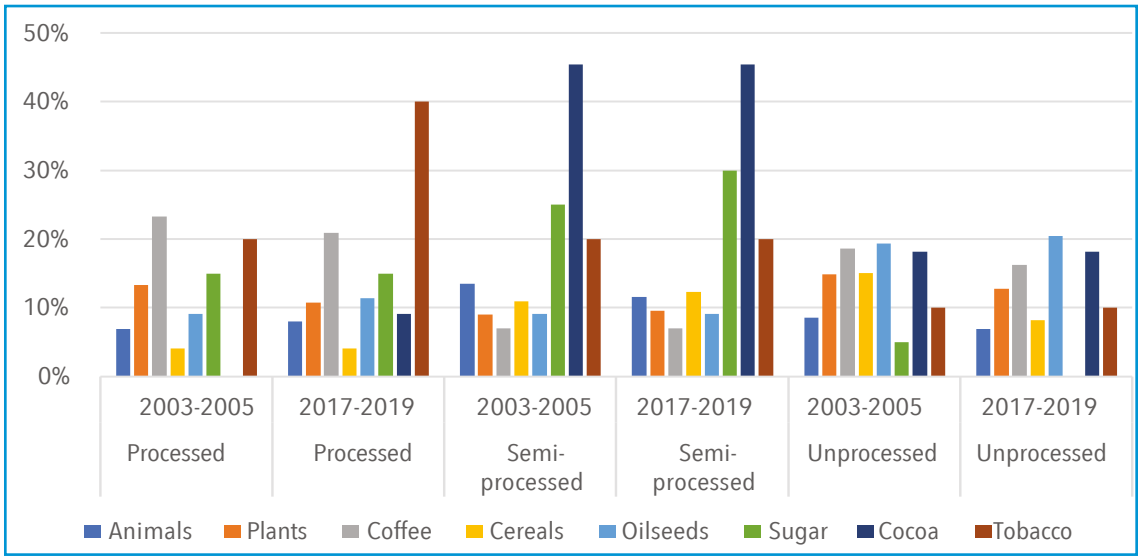
#	HS6	HS6 label	Stage	RCA Africa	Share of Africa in world exports	Share in total African exports
1	080131	Cashew nuts	Unprocessed	30.1	86.6%	0.5%
2	180200	Cocoa; shells, husks, …	Unprocessed	29.6	85.0%	0.0%
3	180100	Cocoa beans	Unprocessed	26.4	76.0%	1.3%
4	080270	Kola nuts	Unprocessed	26.1	75.1%	0.0%
5	090510	Vanilla	Unprocessed	25.5	73.4%	0.2%
6	120740	Sesamum seeds	Unprocessed	23.0	66.1%	0.3%
7	121292	Locust beans	Unprocessed	21.5	61.8%	0.0%
8	180320	Cocoa; paste	Semiprocessed	21.1	60.6%	0.1%
9	010613	Live camels	Unprocessed	19.5	56.0%	0.0%
10	090710	Cloves	Unprocessed	19.3	55.5%	0.0%
11	230500	Oil cake from ground-nut oil	Semiprocessed	19.3	55.5%	0.0%
12	071360	Pigeon peas	Semiprocessed	19.0	54.5%	0.0%
13	410530	Hides and skins of sheep or lambs	Semiprocessed	18.9	54.2%	0.0%
14	070820	Beans	Unprocessed	17.5	50.4%	0.1%
15	080262	Macadamia nuts	Unprocessed	17.5	50.4%	0.1%
16	410621	Hides and skins of goats	Semiprocessed	16.9	48.7%	0.0%
17	130120	Gum Arabic	Unprocessed	15.8	45.4%	0.0%
18	100840	Fonio	Unprocessed	15.6	44.9%	0.0%
19	120730	Castor oil seeds	Unprocessed	15.5	44.6%	0.0%
20	090240	Tea, black	Semiprocessed	15.4	44.1%	0.3%
21	180310	Cocoa; paste	Semiprocessed	15.0	43.0%	0.2%
22	080261	Macadamia nuts	Unprocessed	15.0	43.0%	0.0%
23	010420	Live goats	Unprocessed	14.9	42.7%	0.0%
24	090520	Vanilla	Processed	14.8	42.5%	0.0%
25	160413	Sardines, prepared or preserved	Processed	14.1	40.6%	0.1%
26	160416	Anchovies, prepared or preserved	Processed	14.1	40.6%	0.0%
27	560729	Twine, cordage, ropes, cables of sisal	Processed	13.0	37.4%	0.0%
28	410622	Hides and skins of goats	Semiprocessed	12.7	36.5%	0.0%
29	010410	Live sheep	Unprocessed	12.7	36.4%	0.1%
30	230610	Oil cake from cotton seed oils	Semiprocessed	12.6	36.3%	0.0%

Source: Constructed from the 2021 AATM database.
Note: HS6 labels have been shortened because many are too long to be included in this table.

Africa dominates the world market for some products. For example, Africa accounts for 86.6 percent of world exports of unprocessed cashew nuts. However, these markets represent a small percentage of African exports (Table 2.3, last column): at the world level, these are small markets. On average over 2017–2019, all annual world exports of these 30 products were worth less than US$1.2 billion.[7] In comparison, the world market for soya beans[8] was worth close to $63 billion in 2017–2019. Likewise, Africa has a significant comparative advantage in fonio, but world exports of this cereal averaged only $527 million per year for 2017–2019, whereas world exports of wheat and meslin[9] were worth $38 billion over the same period.

We now construct the same statistics for the three processing stages: unprocessed, semiprocessed, and processed. We have classified each HS6 line into these three processing stages.[10] In total, in 2017–2019, about 34 percent (124) of Africa's 362 RCAs in these eight sectors are at the unprocessed stage, and 32 percent (114) at the processed stage. Figure 2.3 shows the percentage of RCAs by sector and by processing stage, on average for 2017–2019 and for 2003–2005. It is worth noting that the number of RCAs at the processed stage has fallen in plants and coffee, but has increased in animals, oilseeds, cocoa, and tobacco.

Figure 2.3 Share of RCAs (at HS6 level) in 8 sectors by processing stage, 2003–2005 and 2017–2019 (%)



Source: Constructed from the 2021 AATM database.

Economic complexity of African agricultural trade

This section assesses the current state of African countries' productive knowledge and analyzes the change in the structure of the agriculture sector compared to the rest of the world. The "method of reflections" is used to produce indicators of the complexity of a country's agricultural economy (Box 2.1).

This analysis is based on the *diversity* index, which counts the total number of products a country exports competitively (using RCAs), and the *ubiquity* index, which counts the number of countries that are able to export a given product competitively. From the ubiquity index, two characteristics of products are defined: *Standard products* are products for which many countries are competitive (a high ubiquity index). *Exclusive products* are those for which a small number of countries are competitive (a low ubiquity index).

7 "$" refers to US dollars throughout this chapter, unless otherwise indicated.

8 Soya beans other than seed, whether or not broken (HS6 120190).

9 More precisely: Cereals; wheat and meslin, other than durum wheat, other than seed (HS6 100199)

10 This classification was based on a careful reading of the HS6 labels. It may be requested from the authors.

Box 2.1 Analytical framework

The approach used is based on the method of reflections elaborated by Mealy, Farmer, and Teytelboym (2018), Hartmann et al. (2017), Kemp-Benedict (2014), and Hidalgo and Hausmann (2009).

We define metrics using a country-product matrix M with elements M_{cp} indexed by country c and product p. Products included are food and agricultural products exported by African countries (HS6 level). The matrix entries are equal to one if Balassa's (1965) index of RCA is greater than or equal to one, and zero otherwise. RCA is defined as earlier.

From matrix M, countries and products are characterized by introducing a family of variables capturing the structure of the network defined by M_{cp}. The following initial metrics are derived:

$$k_{c,0} = \sum_{p} M_{cp} \quad (1)$$

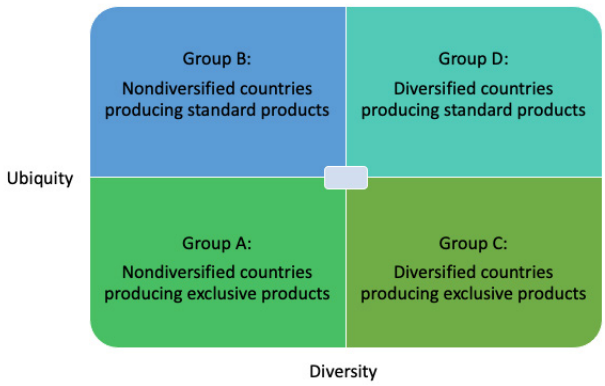
$$k_{p,0} = \sum_{c} M_{cp} \quad (2)$$

The vector $k_{c,0}$, called "diversity," is the number of products a country exports with RCA. The other vector $k_{p,0}$, called "ubiquity," is the number of countries that export a given product with RCA. The vector $k_{c,1}$ is the average ubiquity of a country for all products exported with RCA.

Further, we look at products that countries are able to export to measure their productive capabilities. We provide a characterization of all countries in the world according to a diagram of four quadrants defined by the empirically observed averages diversity ($k_{c,0}$) and ubiquity ($k_{c,1}$). Hidalgo and Hausmann (2009) showed that the location of countries in the $k_{c,0}$ – $k_{c,1}$ diagram is informative about the capabilities available in a country. Africa's participation in global agricultural trade is captured through the location of African countries in the four groups (Figure 2.4).

- **Group A** are nondiversified countries producing exclusive products
- **Group B** are nondiversified countries producing standard products
- **Group C** are countries with a diversified export basket and a specialization in exclusive products
- **Group D** are countries with diversification with specialization in standard products

Figure 2.4 Classification of countries



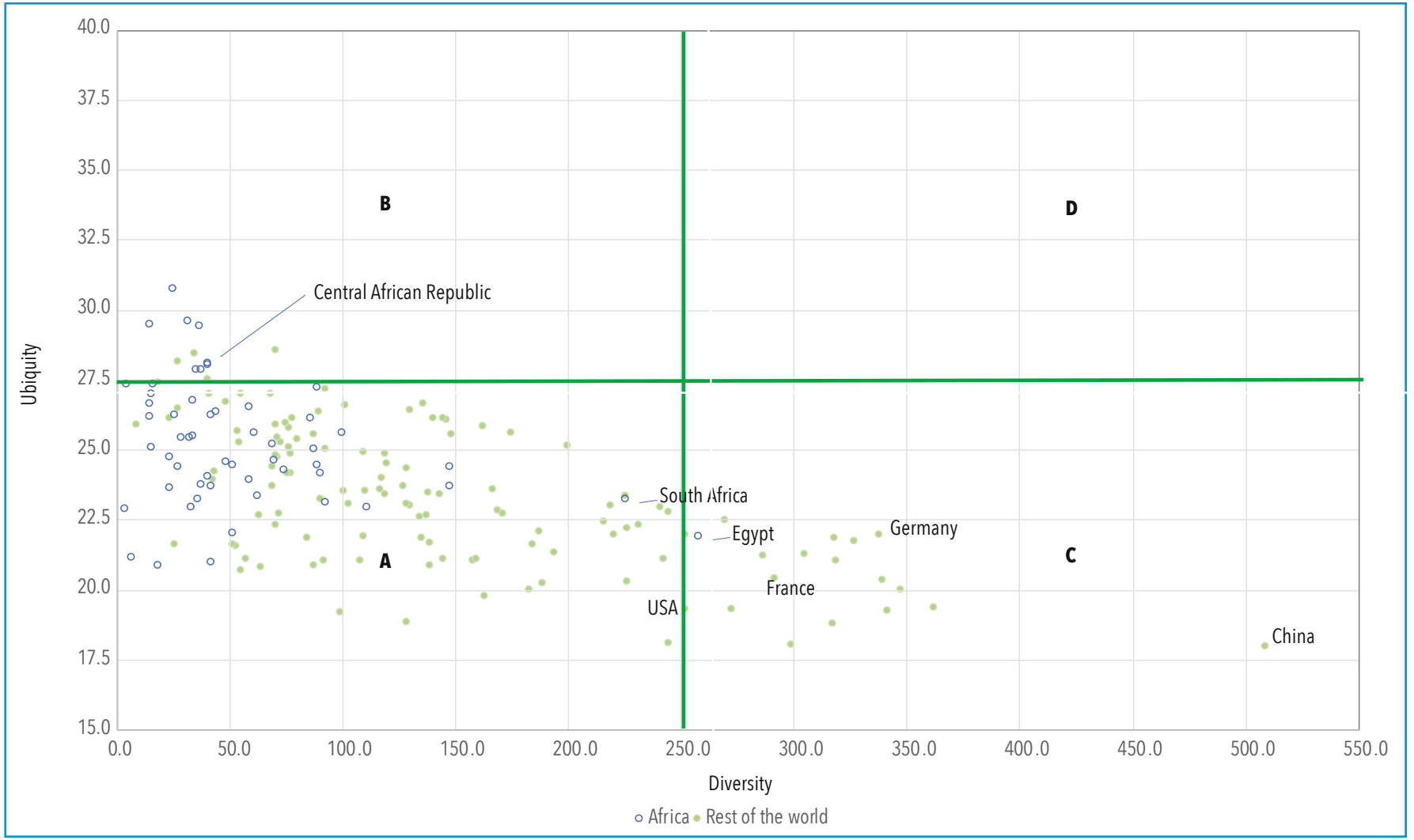
Source: Adapted from Hidalgo and Hausmann 2009.

Figure 2.5 and Figure 2.6 show the information captured through this classification for the periods 2017–2019 and 2003–2005, with the diversity index on the x-axis and the ubiquity index (the average of the ubiquity of products for which the country has RCA) on the y-axis**.** Table 2.4 provides the list of African countries by group. While Hidalgo and Hausmann (2009) defined the four quadrants using the empirically observed averages of $k_{c,0}$ and $k_{c,1}$, we define absolute thresholds to compare countries over time: the middle of the range from the lowest value to the highest value in 2003–2005 is used as the threshold, 250 for the diversity index $k_{c,0}$, and 27.5 for the average ubiquity $k_{c,1}$.

Overall, African countries were mainly nondiversified and their exports concentrated in standard commodities, for which many countries are competitive. However, over time, countries have moved from exporting standard products to exporting exclusive products. For instance, during the period 2017–2019, eight countries have some comparative advantages in standard products (group B, Figure 2.5), while for the period 2003–2005, most of the countries (34 of 54) were included in this group (group B, Figure 2.6).

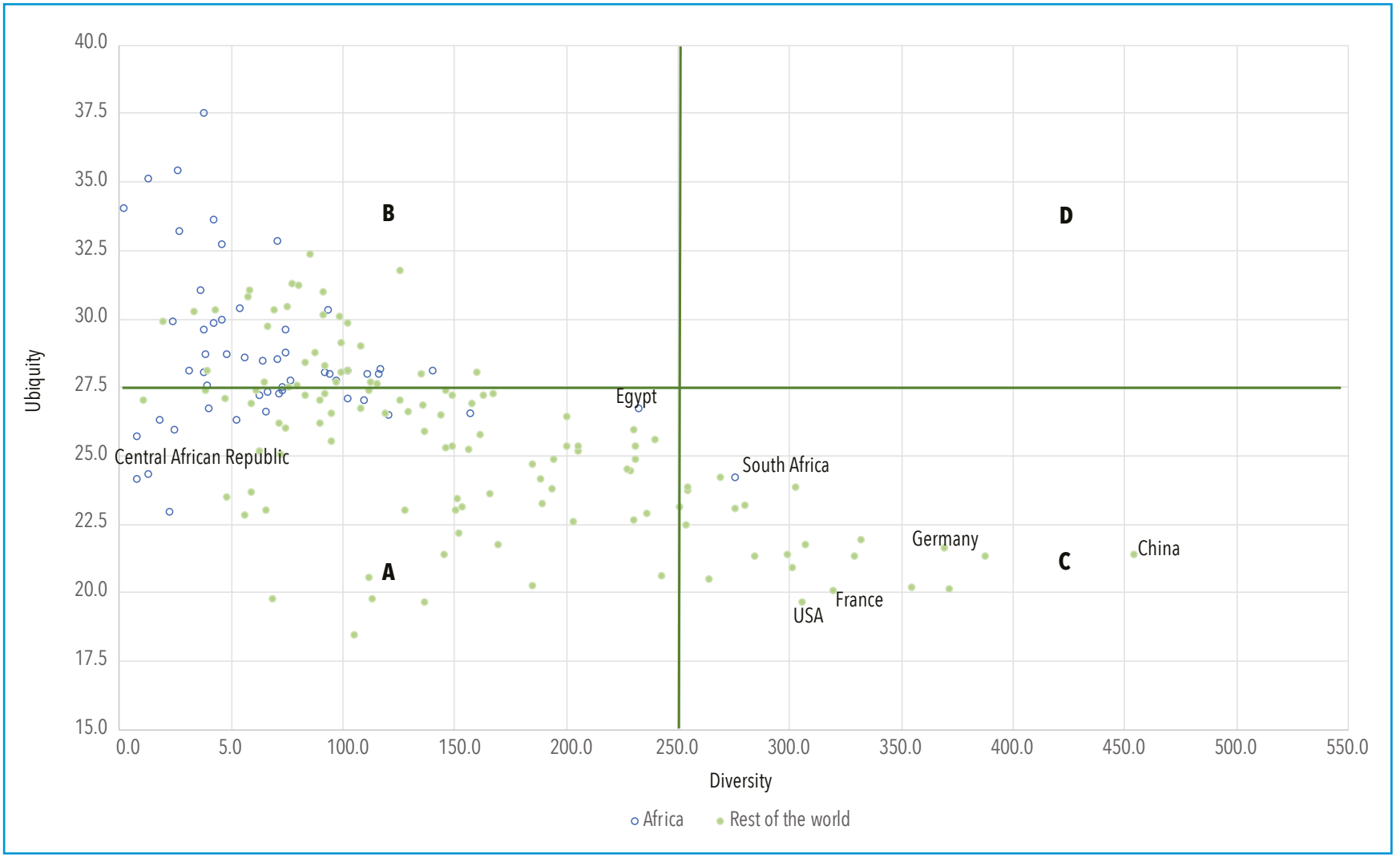
The opposite trend is noted for nondiversified countries producing exclusive products (group A); these increased from 18 countries in 2003–2005 to 46 in the 2017–2019 period. The movement of African countries from group B to group A illustrates the gradual change in Africa's export structure. The Central African Republic is the only country that moved from producing exclusive products to standard products, that is, from group A to B.

Figure 2.5 Method of reflection: Classification of African and other countries, 2017–2019



Source: Constructed from the 2021 AATM database.

Figure 2.6 Method of reflection: Classification of African and other countries, 2003–2005



Source: Constructed from the 2021 AATM database.

Countries with many capabilities are more diversified because they can produce a wider set of products; and, because few other countries will have all the required capabilities to produce these products, diversified countries will be able to make less ubiquitous (more exclusive) products. These countries with a lot of capabilities and producing exclusive products make up group C. South Africa and Egypt are the two African countries with a relatively high diversification index that puts them in the same quadrant as China, European countries like France, Germany, and the Netherlands, and the United States. Finally, Africa is moving to a pro-agricultural export specialization pattern, as most countries are moving from group B (with standard products) to group A (with exclusive products).

Table 2.4. List of African countries by group, 2003–2005 and 2017–2019

2003–2005			**2017–2019**		
Group A	**Group B**		**Group A**		**Group B**
Côte d'Ivoire	Algeria	Libya	Algeria	Mali	Burundi
Chad	Angola	Madagascar	Angola	Mauritania	Central African Rep.
Central African Rep.	Benin	Mali	Benin	Mauritius	Rep. of Congo
Comoros	Botswana	Mauritania	Botswana	Morocco	D.R. Congo
Egypt	Burkina Faso	Mauritius	Burkina Faso	Mozambique	Equatorial Guinea
Eritrea	Burundi	Morocco	Côte d'Ivoire	Namibia	Gabon
Ethiopia	Cabo Verde	Rwanda	Cabo Verde	Niger	Libya
Gambia	Cameroon	Senegal	Cameroon	Nigeria	Rwanda
Guinea-Bissau	Rep. of Congo	Somalia	Chad	Sao Tome & Principe	
Malawi	D.R. Congo	Sudan	Comoros	Senegal	
Mozambique	Djibouti	Togo	Djibouti	Seychelles	
Namibia	Equatorial Guinea	Tunisia	Eritrea	Sierra Leone	
Niger	Eswatini	Uganda	Eswatini	Somalia	
Sao Tome & Principe	Gabon	Western Sahara	Ethiopia	South Africa	
Sierra Leone	Ghana	Zambia	Gambia	South Sudan	
Seychelles	Guinea		Ghana	Sudan	
Tanzania	Kenya		Guinea	Togo	
Zimbabwe	Lesotho		Guinea-Bissau	Tunisia	
	Liberia		Kenya	Uganda	
			Lesotho	Tanzania	
			Liberia	Western Sahara	
			Madagascar	Zambia	
			Malawi	Zimbabwe	
Group C: South Africa			**Group C:** Egypt		

Source: Constructed from the 2021 AATM database using Hidalgo and Hausmann (2009) categorization.
Note: Group A are nondiversified countries producing few exclusive products; group B are nondiversified countries producing standard products; group C are diversified countries producing exclusive products. No countries are found in group D, diversified countries producing standard products.

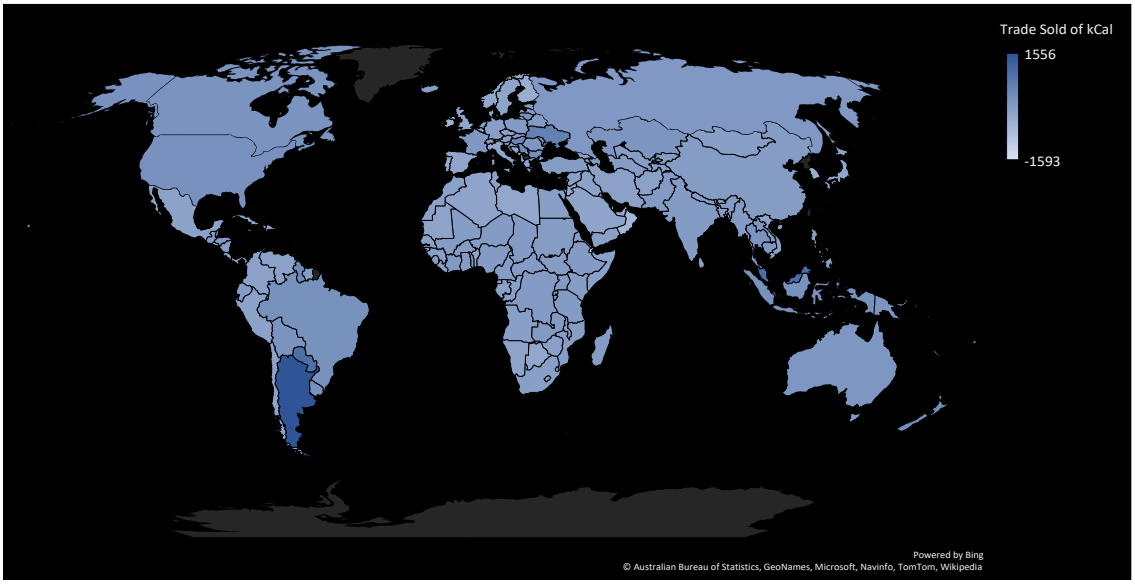
We now propose an entirely different framework for analyzing African comparative advantage in agricultural and food products, based on the caloric content of country balances.

Caloric content of exports and imports

This framework assesses the trade balances of the world's countries in general and African countries in particular by aggregating the exports and imports of each country based on their caloric content — in other words, evaluating the caloric exchanges that take place through the trade of agrifood products. By assigning a caloric content to each ton exchanged at the HS6 level, Laborde (2019) was able to construct a matrix of international caloric exchange to show the importance of trade in food security.

First, we present the trade balance in kilocalories per person per day in 2016 for all countries worldwide (Figure 2.7). The three countries globally with the largest caloric surplus per person per day are Argentina, Malaysia, and Paraguay (decreasing order). Only five African countries have a positive balance sold: Mauritius, Côte d'Ivoire, Zambia, Malawi, and Uganda (decreasing order). Djibouti is the country with the largest deficit in kilocalories per person per day (1,593 kcal). (The World Health Organization [WHO] recommends consumption of an average of 2,100 kcal per person per day.) Of the 52 African countries in the database, 47 are in deficit in terms of kilocalories per person per day.

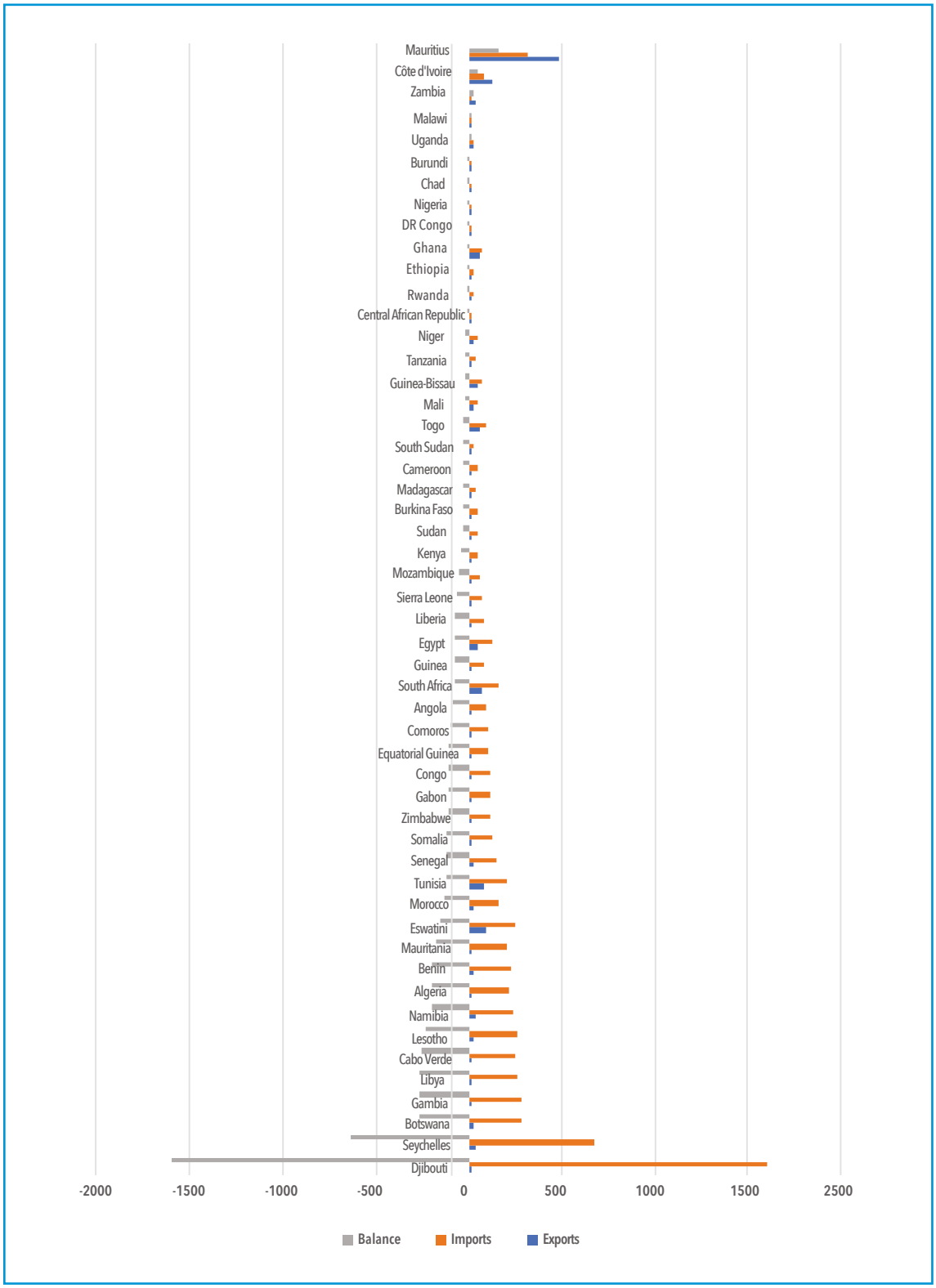
Figure 2.7 Caloric trade balance, 2016 (kcal per person per day)



Source: Constructed from Laborde 2019.
Note: Trade balance is calculated as exports minus imports.

Figure 2.8 provides more detail about African countries, including exports, imports, and trade sold measured in kilocalories per person per day in 2016. Countries are ranked in increasing order of trade sold. At one extreme, Djibouti exports 8 kcal per person per day, but imports 1,601 kcal per person per day, equal to 76 percent of the WHO-recommended calorie consumption. Twelve African countries import more than 10 percent of the recommended daily consumption. On the export side, while Mauritius is the largest exporter of kilocalories per person per day, its exports are only 481 kcal per person per day, or 23 percent of the WHO recommendation.

Figure 2.8 African caloric exports, imports, and trade balance, 2016 (kcal per person per day)

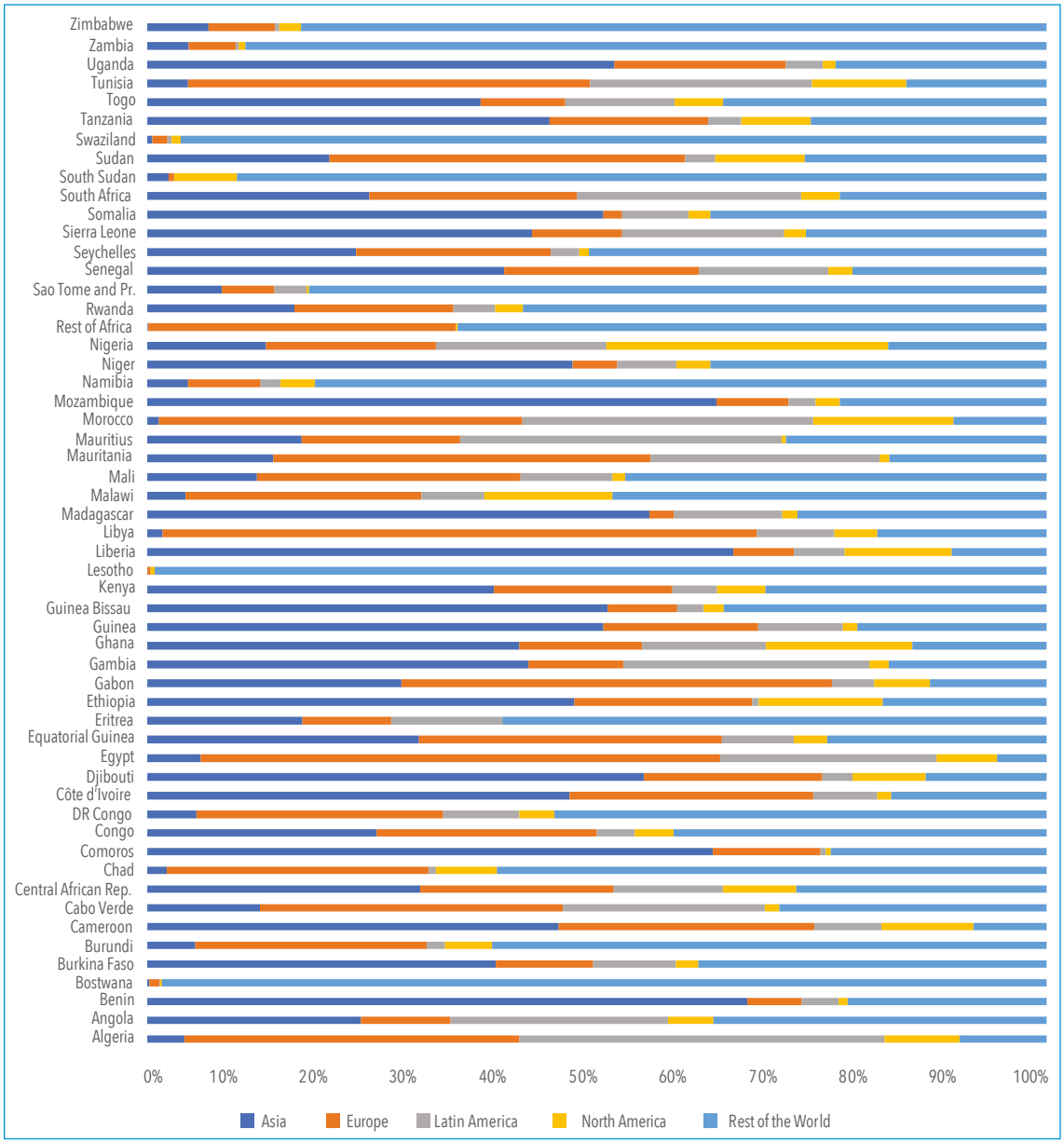


Source: Constructed using Laborde 2019.

Note: Trade balance is calculated as exports minus imports.

Figure 2.9 presents the geographic structure of African caloric imports with the potential exporting countries grouped into five regions: Asia, North America, Latin America, Europe, and the rest of the world (including Africa).

Figure 2.9 Geographic structure of calorie imports of African countries, 2017 (%)



Source: Constructed from Laborde 2019.
Note: Rest of the World includes Africa and Oceania.

Europe and Latin America are the top two suppliers of calories to Africa, with 26.6 percent of calories imported from Europe and nearly 20 percent from Latin America. Europe is by far the main source of caloric imports in many North African countries, and also in Gabon. Latin America is an important caloric exporter to Algeria, Mauritius, and Morocco.

In sum, most African countries have a caloric deficit, but this deficit is relatively small for about three-quarters of them.

AN OVERVIEW OF TRADE IN RESOURCES

This section looks at the resources embedded in African agricultural trade flows compared with other continents, with a focus on fertilizers and pesticides, labor, and virtual water.

Fertilizers and pesticides

Commonly used fertilizers contain the three basic plant nutrients: nitrogen, phosphorus, and potassium. Africa's participation in global trade in fertilizers (nutrients) increased significantly between 2003–2005 and 2016–2018, up 6.6 percentage points for nitrogen exports and 37.7 percentage points for potassium imports (Table 2.5). Only participation in phosphate exports decreased (down 2.1 percentage points). In the recent period, the African share resembles the participation of Asia and Europe, especially for imports of nitrogen (29.6 percent), phosphate (35.1 percent), and potassium (potash) (39.9 percent).

Table 2.5 Fertilizer use, production, and trade by nutrient, 2003–2005 and 2016–2018 (% of total)

		2003–2005					2016–2018				
		Africa	**Americas**	**Asia**	**Europe**	**Oceania**	**Africa**	**Americas**	**Asia**	**Europe**	**Oceania**
Nitrogen (N)	Agricultural use	**3.2**	21.3	59.0	15.0	1.5	**22.2**	13.1	58.4	13.7	1.8
	Production	**3.3**	15.8	56.8	23.5	0.5	**14.9**	12.2	59.8	20.3	0.4
	Import	**5.4**	31.8	28.2	30.6	4.0	**29.6**	9.3	29.9	31.0	4.1
	Export	**4.3**	20.7	23.7	51.0	0.4	**10.9**	7.9	39.2	39.6	0.2
Phosphate (P2O5)	Agricultural use	**2.5**	26.9	55.5	11.3	3.9	**29.1**	11.9	55.7	8.8	2.9
	Production	**7.4**	25.1	48.6	16.5	2.2	**18.0**	12.7	55.9	14.4	1.5
	Import	**3.9**	33.6	34.2	22.7	5.4	**35.1**	9.4	36.4	20.4	4.1
	Export	**16.0**	35.9	12.8	34.5	1.0	**13.9**	11.3	38.5	27.6	1.1
Potash (K2O)	Agricultural use	**1.9**	37.3	41.7	17.6	1.5	**34.2**	13.6	51.2	11.3	1.2
	Production	**0.0**	35.8	13.1	51.3	0.0	**31.5**	28.0	23.0	45.4	0.0
	Import	**2.2**	37.3	38.4	20.7	1.6	**39.9**	19.3	38.0	17.7	1.2
	Export	**0.4**	38.5	8.5	52.7	0.0	**34.1**	31.2	7.8	57.5	0.0

Source: Constructed using FAO 2021.
Note: Fertilizer imports (exports) include intracontinental trade and are approximated using the total imports (exports) across countries.

Global trade in pesticides for agricultural use more than doubled from 2003–2005 to 2016–2018 (from 2.6 to 5.7 million tons on average on the import side). Africa's share in pesticide imports increased slightly, from 9.4 to 11.2 percent of global imports, over this period, but its market share for exports decreased from 2.1 to 1.1 percent of global exports (Table 2.6). Although Africa's participation in pesticide trade is low compared to other regions, the continent has the lowest unit price for pesticides (price estimated by export unit value). However, lower prices are not synonymous with competitiveness; they may simply reflect lower quality.

Table 2.6 Pesticide trade participation by world region, 2003–2005 and 2016–2018

		Imports % of world trade	Import unit value US$ per kilogram	Exports % of world trade	Export unit value US$ per kilogram
2003–2005	Africa	9.4	3.4	2.1	3.6
	Americas	26.2	5.4	20.9	5.1
	Asia	20.7	4.8	28.4	4.0
	Europe	41.4	7.1	47.9	7.3
	Oceania	2.3	6.2	0.7	7.3
2016–2018	Africa	11.2	4.1	1.1	5.6
	Americas	26.1	6.6	14.9	6.8
	Asia	23.5	5.7	43.6	4.5
	Europe	34.8	7.3	39.9	7.4
	Oceania	4.4	4.2	0.5	7.1

Source: Constructed from FAO 2021.

Labor content in trade

To estimate the labor content of traded products, we rely on the World Integrated Trade Solution (WITS) dataset, for which the most recent year is 2011. "Labor content" refers to labor value added embodied directly in agriculture sector exports relative to the total domestic value added embodied in agricultural exports, which includes labor as well as capital, land, and other natural resources.

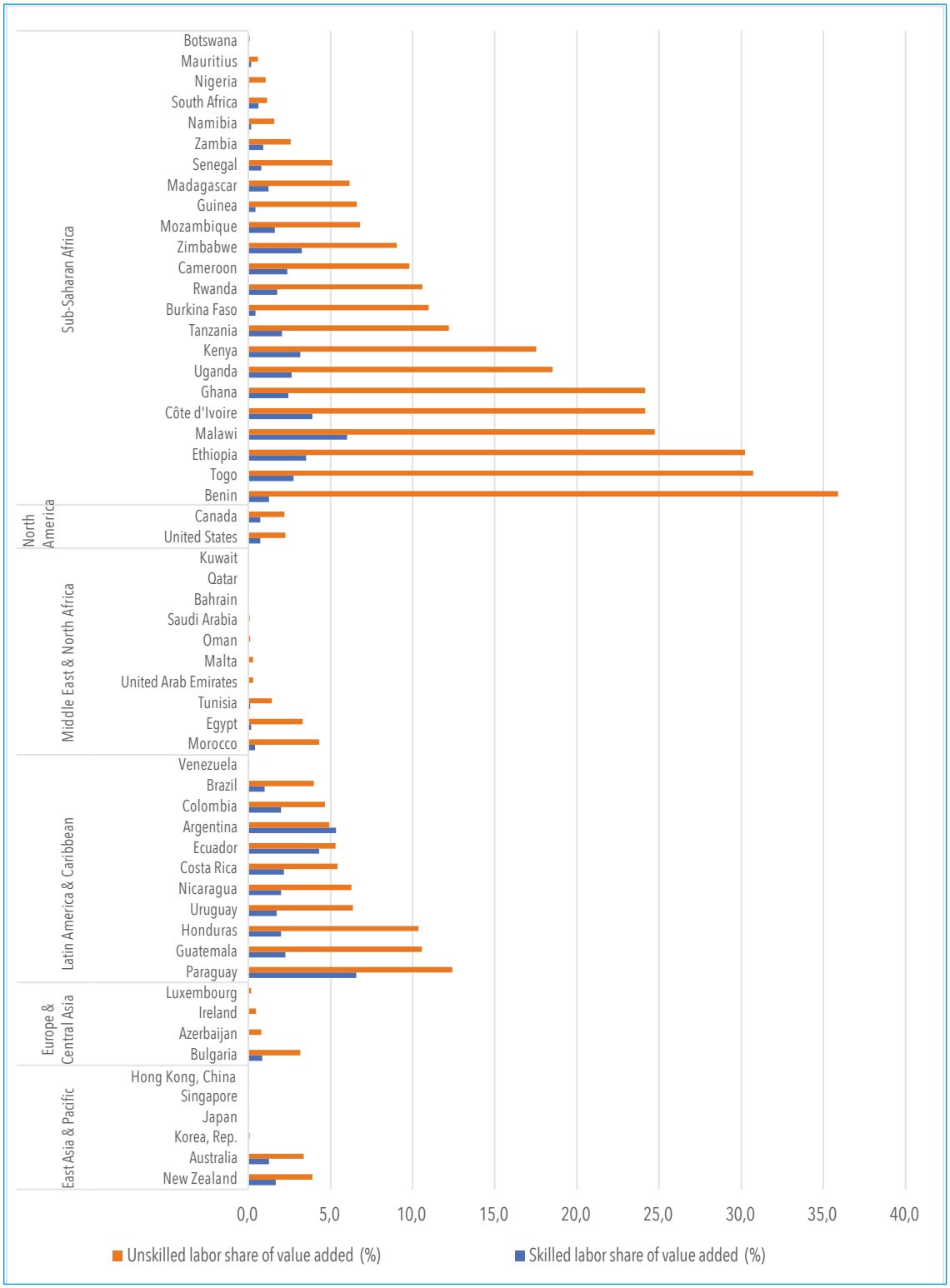
Our findings suggest that unskilled labor content, evaluated as a share of agricultural value added, is more essential in African countries, especially Benin, Togo, Ethiopia, Malawi, Côte d'Ivoire, and Ghana, which all have a share above 20 percent (Figure 2.10). Skilled labor is more important for countries like Paraguay, Malawi, Argentina, and Ecuador. Argentina is the only country where skilled labor contributes more than unskilled labor. Overall, the African agriculture sector is intensive in unskilled labor, while most developed countries and developing countries in other regions create value added with less labor input.

Water content in trade

Finally, we provide a quick overview of water content in agricultural trade. Though water as such is rarely traded over long distances, the global trade of goods is associated with a virtual transfer of water. "Virtual water content" refers to the amount of water required to produce a good, considering all the steps involved in its production. The term "virtual" emphasizes that the water is conceptually embedded though not physically present in the good. Several studies have documented the virtual redistribution of water through trade (Carr et al. 2013; Konar and Caylor 2013; Oki, Yano, and Hanasaki 2017; D'Odorico et al. 2019).

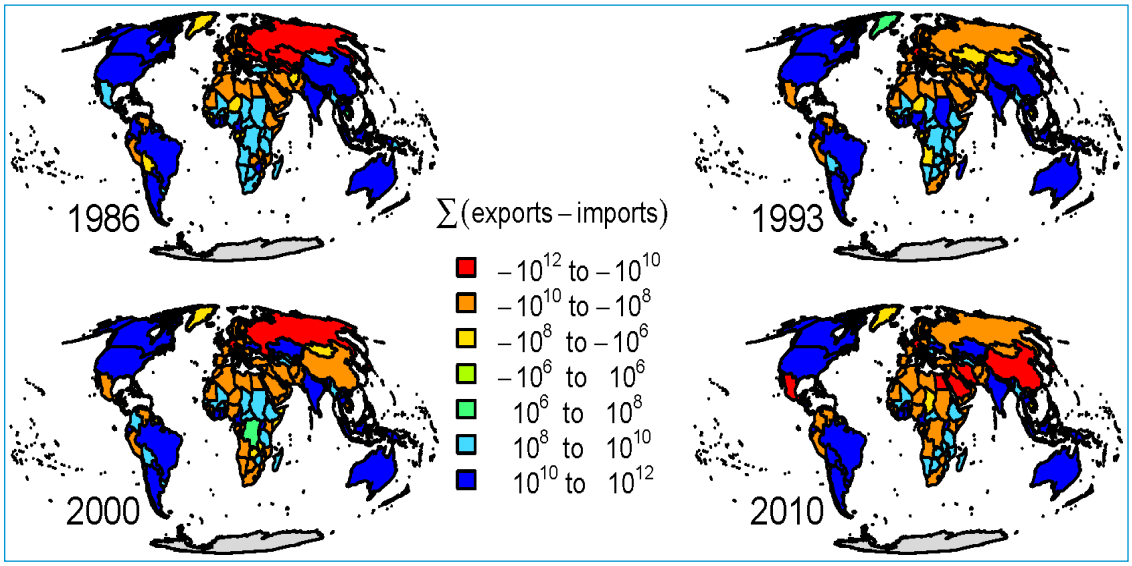
Figure 2.11 shows the evolution of the status of net exporting countries and net importing countries between 1986 and 2010. Over this period, the ratio of net importers to net exporters increased from 1.32 to 2.50. African countries, which in 1986 were predominantly net exporters of virtual water, had become net importers by 2010.

Figure 2.10 Labor content in agricultural trade in 2011, share of value added (%)



Source: Constructed using WITS data.

Figure 2.11 Virtual water export–import balance for 1986, 1993, 2000, and 2010 (m^3)



Source: Carr et al. 2013.

In view of this virtual trade in water, Oki, Yano, and Hanasaki (2017) investigate the potential for international trade in agricultural products to alleviate physical water stress. They propose some strategies for sustainable development: most importantly, countries with abundant water resources should focus on developing water resources and producing water-intensive commodities for export, while countries with scarce water resources should focus on developing commodities that require less water. D'Odorico et al. (2019) conclude that international trade can save national resources through the importation of water-intensive commodities. Zhao et al. (2018) estimate that virtual water trade alleviates water stress and promotes water sustainability in China.

For Africa, Konar and Caylor (2013) show that, in terms of embodied water resources, regional trade is most efficient. Their study presents a virtual water trade network and highlights trade links between African countries. Africa does not export large volumes of virtual water to the rest of the world (1.18 km^3 out of a total of 62.85 km^3 traded globally). However, trade among African countries is over twice the volume the continent exports to the rest of the world (3.59 km^3). At the country level, virtual water trade from South Africa to Zimbabwe is the largest in the internal African water trade network, accounting for 0.37 km^3 of virtual water, or nearly 10 percent of intra-African flows. In 2008, South Africa was the main exporter of virtual water, with flows accounting for 31 percent of total intra-African water trade. On the import side, Zimbabwe accounts for about 19 percent of virtual water imports.[11]

WHAT CAUSES THE WEAK PERFORMANCE OF AFRICA IN GLOBAL AGRICULTURAL TRADE?

This section examines domestic causes and trade policies that constrain Africa's performance in global agricultural trade.

Domestic causes

Analysis of Africa's use of inputs and agricultural productivity helps explain export performance and can provide complementary evidence for analysis of trade issues. In this report, we explore

11 Unfortunately, more recent data are not available.

patterns of domestic causes of poor trade performance across continents to identify potential gaps.

Table 2.7 examines land use performance around the world. In Africa, the share of the total land area devoted to agriculture is lower than in other regions. However, the share of agricultural land cultivated with crops (44.5 percent) is higher than the world average (31.9 percent), though lower than in Asia (72.9 percent).

Table 2.7 Land use indicators by continent, 2016–2018 average

Indicators	World	Africa	America	Asia	Europe	Oceania
Agricultural land (% of land area)	30.4	25.6	56.2	51.5	50.5	43.6
Cropland (% of agricultural land)	31.9	44.5	22.1	72.9	6.3	8.8
Arable land (% of agricultural land)	29.7	43.9	20.1	68.5	6.1	8.6
Permanent cropland (% of agricultural land)	2.2	0.6	2.0	4.3	0.3	0.4
Perm. meadows and pastureland (% of agricultural land)	68.1	55.5	77.9	27.1	93.6	91.0
Perm. meadows and pastureland (% of land area)	20.7	14.2	43.8	14.0	47.3	39.7
Agriculture area under organic agric. (% of agricultural land)	0.9	0.3	0.4	0.1	2.9	8.9
Land area equipped for irrigation (% of agricultural land)	4.7	5.9	10.3	30.6	0.6	0.7
Land area equipped for irrigation (% of cropland)	14.6	13.3	46.6	42.0	9.5	7.8

Source: Constructed from FAO 2021.

"Permanent cropland" is land cultivated with crops that occupy the land for long periods and do not need to be replanted after each harvest (citrus, cocoa, oranges, pineapples, and others). In Africa, permanent cropland as a share of agricultural land, at about 0.6 percent, is quite low compared with other regions (Table 2.7). It is worth noting that Africa has potential to increase land use and boost performance through irrigation and the use of organic agriculture, which is low in Africa compared to America and Asia.

To assess regional agricultural land productivity, we use gross production value as a performance indicator. Africa's agricultural land productivity, with a gross production value of $761 per hectare, is lower than all other regions except Oceania (Table 2.8). Asia is the best performing region, with land productivity almost six times higher. However, Africa's performance improved notably between 2003–2005 and 2016–2018, with an increase of 45.5 percent in gross production value per hectare.

Table 2.8 Agricultural productivity by region, 2003–2006 and 2016–2018 averages

	Gross production value (billion US$)		Gross production value per ha of agricultural land (US$)		Gross production value per ha of arable land (US$)	
	2003–2006	**2016–2018**	**2003–2006**	**2016–2018**	**2003–2006**	**2016–2018**
World	12,976	17,168	2,682	3,579	9,521	12,328
Africa	847	1,240	761	1,107	3,974	5,158
Americas	2,789	3,564	2,409	3,033	8,139	10,218
Asia	7,144	9,902	4,297	5,934	14,255	19,868
Europe	2,006	2,231	4,211	4,830	7,167	8,166
Oceania	190	230	443	622	7,299	7,274

Source: Constructed using FAO 2021[12].
Note: All figures are in constant 2004–2014 US dollars.

Fertilizers play an important role in providing the nutrients that crops need, and can significantly increase crop yields and agricultural productivity. Table 2.9 compares Africa's consumption of fertilizer with that of other regions. Africa relies on fertilizer imports with a dependency ratio (defined as the ratio of consumption to production) of 177.4 percent. Similarly, East Asia, South Asia, and Latin America also rely on fertilizer imports; however, their consumption per hectare of arable land is relatively high. Consumption in Africa south of Sahara is the world's lowest at about 16 kg per hectare, which is reflected in low cereal yields.

Table 2.9 Fertilizer consumption and cereal yields by region, 2016–2017

	Fertilizer consumption (% of fertilizer production)	Fertilizer consumption (kg/ha of arable land)	Cereal yield (kg/ha)
Arab World	20.3	68.4	1,884.3
East Asia & Pacific	114.5	331.0	5,097.0
Europe & Central Asia	52.1	80.7	3,856.6
European Union	91.7	152.6	5,298.0
Latin America & Caribbean	200.7	140.2	4,424.6
Middle East & North Africa	20.5	94.8	2,582.3
North America	77.4	127.2	7,384.5
South Asia	149.4	160.3	3,185.5
Sub-Saharan Africa	177.4	16.2	1,448.0

Source: Data from World Development Indicators.

12 http://www.fao.org/faostat/en/#data/QV, accessed on February 21, 2021.

Agricultural productivity is also boosted by public spending. At the 2003 African Union summit in Maputo, heads of states committed to allocating at least 10 percent of total government expenditures to the agriculture sector within five years. In most African countries, government spending is relatively low compared with agricultural GDP. The only countries with a share greater than 20 percent are Lesotho, Zambia, Seychelles, Cabo Verde, Botswana, and Mauritius (Figure 2.12). However, in these countries, agriculture accounts for only a small share of GDP, ranging from 2 to 6 percent.

In contrast, countries highly dependent on agriculture such Liberia, Sierra Leone, Guinea Bissau, Niger, and Mali (Figure 2.13) spend little on research in comparison with agricultural value added (Figure 2.14). Only Ethiopia, Sierra Leone, Benin, Mali, and Senegal met or exceeded the Maputo 10-percent target between 2017 and 2019 (Figure 2.14).

Figure 2.12 Share of public agricultural expenditure in agricultural value added, 2017–2019 average (%)

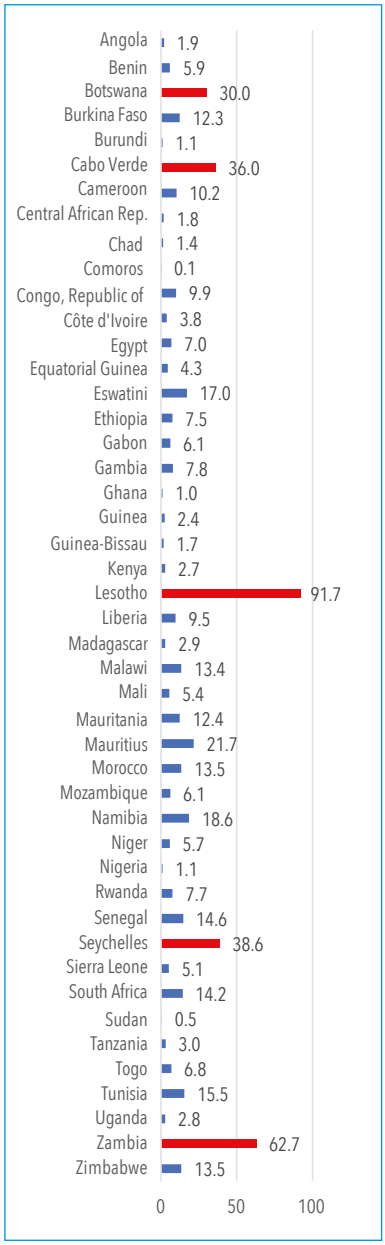


Figure 2.13 Share of agricultural value added in total GDP, 2017–2019 average (%)

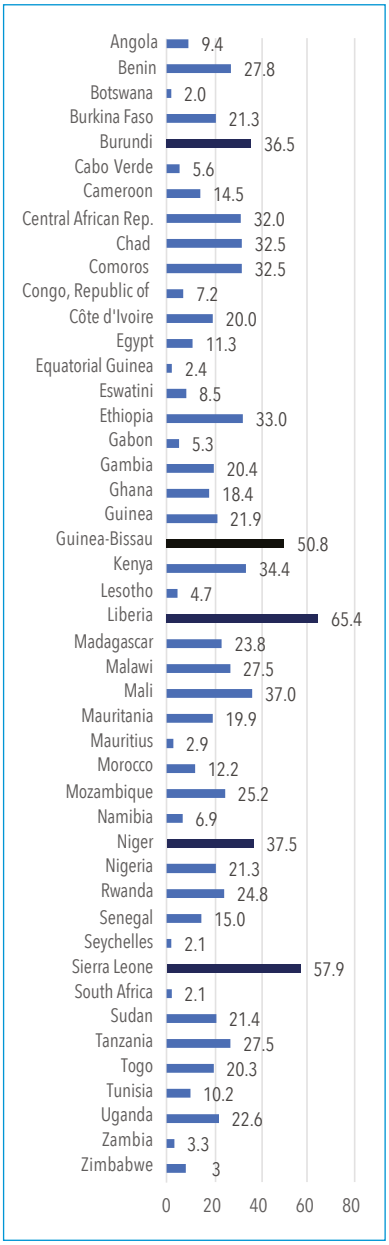
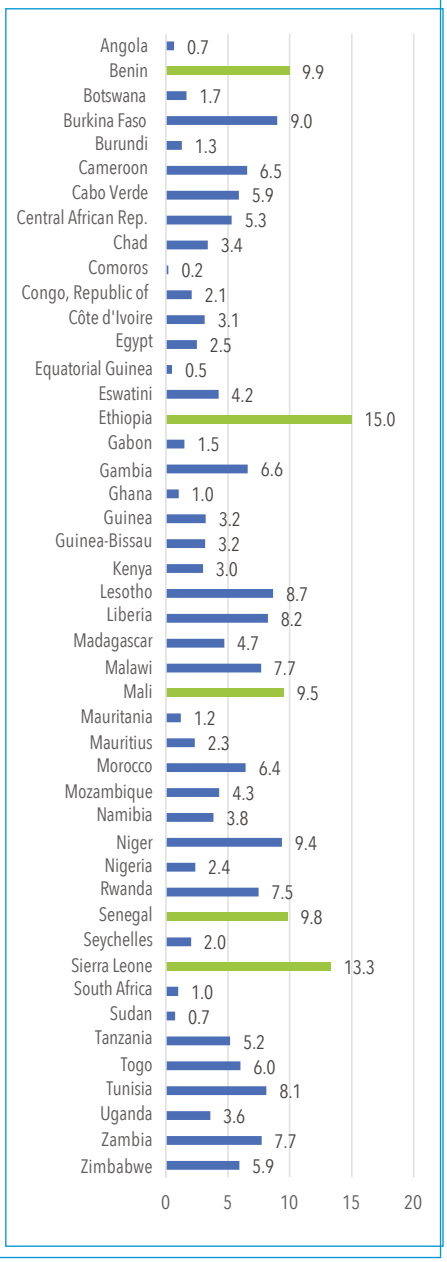


Figure 2.14 Share of public agricultural expenditure in total expenditure, 2017–2019 average (%)



Source: Constructed from ReSAKSS 2021.

Note: The five countries with the highest shares are highlighted in Figure 2.12 (red), Figure 2.13 (black), and Figure 2.14 (light green).

Agricultural research and development (R&D) is a crucial determinant of agricultural productivity and production, and therefore of food prices and poverty (Bado and Bationo 2018; Howitt and Miskelly 2017). To compare the R&D performance of African countries with benchmark countries in Asia and Latin America, we use a comprehensive primary dataset developed by ASTI.[13] The most recent data included are for the period 2013–2017.

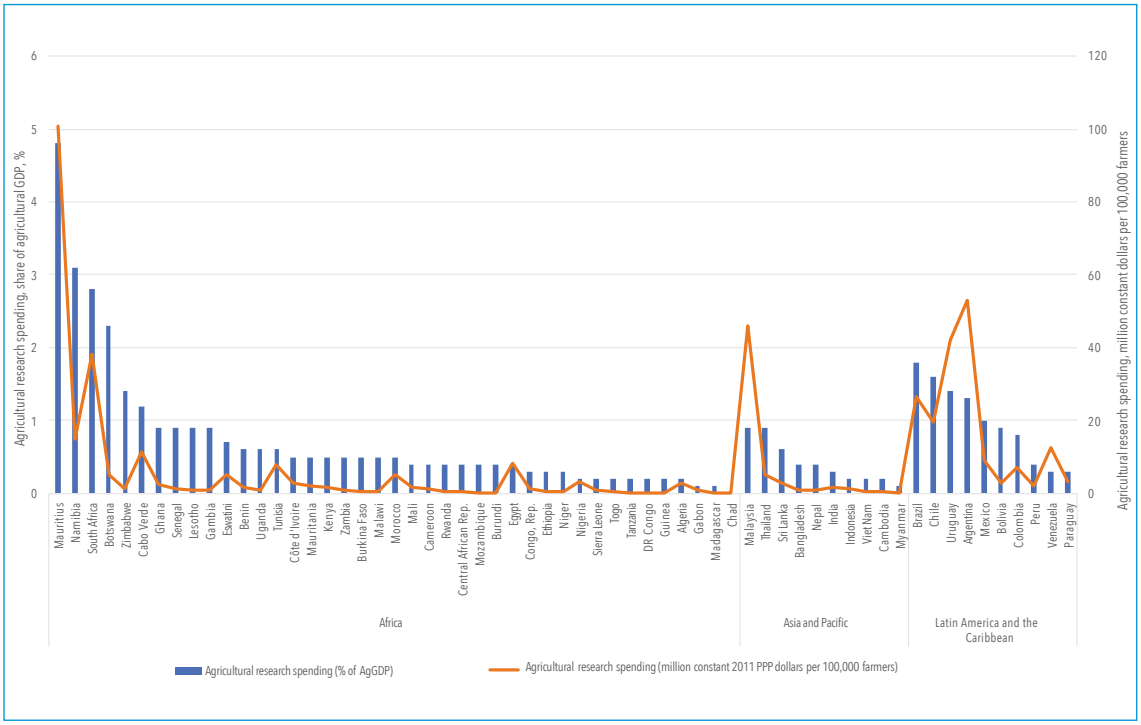
13 https://www.asti.cgiar.org/

In 2007, the African Union set a target for government spending on agricultural R&D of at least 1 percent of agricultural GDP to support an agriculture-led development agenda. However, as yet, the only countries that have met this goal are Mauritius, Namibia, South Africa, Botswana, Zimbabwe, and Cabo Verde, for which agricultural R&D spending as a percentage of production value (research intensity) remains comparatively high (Figure 2.15). In most African countries, agricultural R&D spending remains below 1 percent of agricultural value added. R&D spending per farmer is also low in Africa. Around the world, Malaysia, Thailand, and South American countries are among the highest spenders (Figure 2.15).

Another useful measurement of R&D investment is the ratio of researchers (expressed in full-time equivalents or FTEs) to farmers. For most African countries, there are fewer than 10 FTE researchers per 100,000 farmers (Figure 2.16). Argentina, Mauritius, Uruguay, and Malaysia lead the developing countries with researchers per 100,000 farmers ranging from 49 to 423 FTEs. The same trend holds when researcher FTEs are compared with the total population. Underinvestment in agricultural R&D is a political issue in Africa; investment remains low despite the high economic returns it could provide (Benin, McBride, and Mogues 2016).

The economic benefits of agricultural R&D spending can be expected to lag behind investments. While some studies have assumed a lag of 10 or 15 years, Alston, Pardey, and Ruttan (2008), who examined time-series data on US agricultural productivity, found a substantially longer lag of about 24 years between R&D investments and the full economic impact. Therefore, even if R&D is a key determinant of productivity, knowledge creation and development need some years to have an effect. Current low investment by African countries in R&D will likely be reflected in their agricultural performance 10 to 20 years from now.

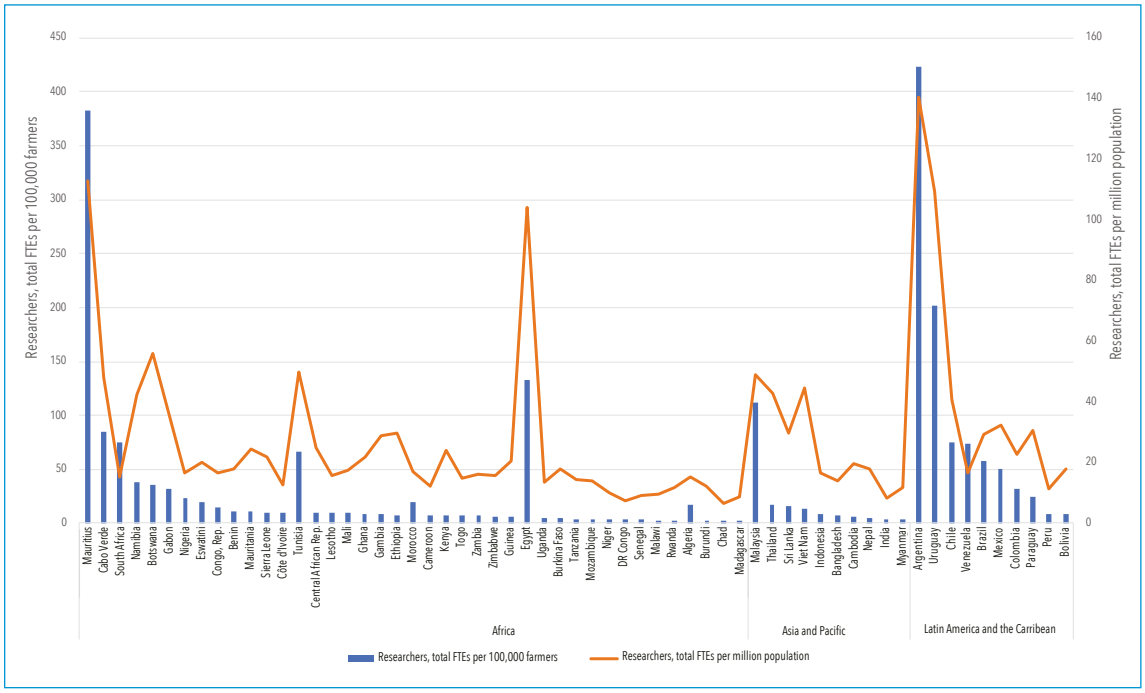
Figure 2.15 Agricultural research spending in developing countries, total and share of agricultural GDP



Source: Constructed from ASTI database.

Note: Data are for the most recent year available from 2013 to 2017. PPP dollars = purchasing power parity in dollars.

Figure 2.16 Number of researchers in developing countries, per farmer and per capita



Source: Constructed from ASTI database.
Note: Data are for the most recent year available from 2013 to 2017. FTE = full-time equivalent.

Trade policy causes

Previous AATM reports have highlighted the impact of high tariffs on Africa's agricultural trade, within Africa and elsewhere. The 2020 report concluded that further tariff liberalization is needed, both for African country tariffs on their agricultural imports and for tariffs imposed by Africa's trading partners on African agricultural exports. It calculated that "76 percent of African countries impose average duty rates higher than 10 percent" and that "40 percent of African countries face an average duty higher than 10 percent in exporting to world agricultural markets" (Odjo and Zaki 2020, 27). Prepared food products are highly protected by African governments through high tariffs on imports, whereas African exports of products including cashew nuts, sesamum seeds, and maize face high tariffs in foreign countries.

Because the data on tariffs have not been updated recently,[14] this year's AATM focuses on nontariff measures (NTMs).

NTMs encompass a large range of measures, from regulations on pre-shipment inspection of cargo to sanitary and phytosanitary (SPS) measures to rules of origin related to the implementation of a free trade agreement, among others. A distinction is usually made between import-related measures (SPS measures, technical barriers to trade [TBTs], contingent protection, and others) and export-related NTMs (export bans, export subsidies, and others).

In this chapter and in Chapter 3, the data on NTMs on agricultural products are derived from several databases, including the WTO Integrated Trade Intelligence Portal (WTO I-TIP) and the World Bank's Temporary Trade Barriers Database. Here we look at NTMs imposed by African countries and NTMs faced by African countries.

14 The MAcMap-HS6 database is operated by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) based in Paris.

NTMs imposed by African countries

Among African countries, Ethiopia has adopted the most NTMs, followed closely by Nigeria (see Chapter 3). In Ethiopia, 95 percent of products and 98 percent of the value of imports are affected by at least one NTM. In Nigeria, these figures are 91 percent and 94 percent. In comparison, Togo, Côte d'Ivoire, and Niger have imposed relatively few NTMs in terms of both frequency (15 percent of products for Togo) and coverage of imports (13 percent for Togo).[15]

The prevalence scores of NTMs in Africa confirm that while Côte d'Ivoire, Niger, and Togo have adopted few NTMs (0.2, 0.5, and 0.6 on average per product), Algeria, Ethiopia, and Nigeria have adopted many (respectively 2.6, 2.0, and 2.3 on average per product). These frequency indexes and coverage ratios are similar to levels in Latin America, but significantly below Asian levels.

Benin, Burkina Faso, Cabo Verde, Ethiopia, Mali, and Nigeria stand out in terms of high frequency indexes and coverage ratios by HS section. In all these countries except Burkina Faso, 100 percent of products and of the value of imports are covered by at least one NTM. Frequency indexes are relatively low in Senegal, Cameroon, and Liberia. And across Africa, food products are less frequently subject to NTMs than animals and animal products and fruits and vegetables.

Some African countries, including Cameroon, Côte d'Ivoire, and Togo, have adopted relatively fewer NTMs. In Côte d'Ivoire, only four HS sections see frequency indexes of more than 10 percent (animals, vegetables, food products, and chemicals), while five HS sections record a frequency index of zero percent (hides and leather, wood, footwear, metals, and miscellaneous). In Togo, only five HS sections see coverage ratios of 10 percent or above (animals, vegetables, food products, plastics and rubbers, and transportation), while in six HS sections (minerals and fuels, hides and leather, textiles and clothing, footwear, metals, and machinery and electrical), the coverage ratio is zero percent.

To understand the impact of these NTMs, the ad valorem equivalents (AVEs) of NTMs — that is, the import tariff rate that would have a trade impact equivalent to the NTM — have been calculated by Nguyen, Bouët, and Traoré (2020). These equivalents are estimated for the two most common NTMs: SPS measures and TBTs.[16]

The AVEs of SPS barriers in Africa are especially high in the following chapters: (1) lac; gums, resins and other vegetable saps and extracts, (2) cocoa and cocoa preparations, and (3) preparations of cereals, flour, starch or milk; pastrycook products. The highest is in Algeria in the chapter lac; gums, resins and other vegetable saps and extracts, with NTMs impeding imports to the same degree as an import duty of 100.6 percent. The AVEs of TBTs in Africa are in the same range, again with higher figures in the cocoa and cocoa preparations chapter. These AVEs of SPS barriers and TBTs in Africa are lower than those in Asia. In Latin America, however, SPS measures have a significant negative impact on trade in the animals section, while for other sections, the region is comparable to Africa and Asia.

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15 A frequency index is the percentage of products subject to one or more NTMs; a coverage ratio is the percentage of imports in value subject to one or more NTMs; a prevalence score of NTMs is the average number of NTMs that apply to a product.

16 This section relies heavily on Nguyen, Bouët, and Traoré (2020), who first estimate the trade impact of NTMs, included in a gravity equation as a dummy variable, and then, based on import demand elasticities from the extensive work of Ghodsi et al. (2016b), operate a nonlinear transformation for ex post computation of AVE. A specificity of this study is to consider Jensen's inequality. Concerning the gravity equation, regressions include a period of study ranging from 2009 to 2018 and 115 importing countries for which the NTM data are available, and are conducted separately for 704 agricultural products (HS 01–24) with the Poisson Pseudo-Maximum-Likelihood (PPML) estimator and a set of fixed effects including importer, exporter, year, and importer-exporter fixed effects. The data on NTMs is based on the WTO Integrated Trade Intelligence Portal and the UNCTAD Trade Analysis Information System database.

In some cases, the AVE of an NTM can be negative, meaning that the measure facilitates trade. For example, the AVE of SPS regulations in Burkina Faso in the meat and edible meat offal sector is calculated at −35.8 percent, and in Côte d'Ivoire at −41.0 percent. A sanitary certification gives consumers some information about a product and may increase consumers' confidence in its quality. Because food products are experience goods — that is, their value depends on characteristics such as quality and safety that are difficult or even impossible to observe in advance but can be discovered with consumption — a sanitary certificate informs the consumer about these characteristics, providing information that the market does not.

NTMs faced by African countries

We now turn to the trade-damaging impact of NTMs imposed by Africa's trade partners. We focus on the top seven potential importing countries (based on GDP): United States, China, Japan, Germany, India, United Kingdom, and France. GDP is a good proxy for the demand potential of an export destination. UNCTAD Trains covers the European Union's TBTs and SPS barriers, but not NTMs for individual European countries. However, trade statistics and price elasticities of imports available at the level of European countries and HS2 chapters can be used to estimate the impact of NTMs on trade and the AVE of NTMs for each European country–HS2 chapter pair (Nguyen, Bouët, and Traoré 2020).

Table 2.10 presents the AVEs of SPS barriers for the 23 agricultural chapters for the seven countries as of 2018. Table 2.11 covers TBTs. These are import-weighted averages at the HS2 level of AVEs calculated at the HS6 level.

Table 2.10 AVEs of SPS barriers: Top 7 countries by GDP, 2018 (%)

HS2	HS label	China	France	Germany	India	Japan	United Kingdom	USA
01	Live animals			56.8		10.3	38.7	3.8
02	Meat and edible meat offal	27.8	51.3	45.8		42.3	51.7	38.8
04	Dairy produce		59.5	46.3	70.1		47.3	
05	Products of animal origin		29.7	53.8		57.4	104.4	19.3
06	Live trees and other plants	-7.3	53.0			52.8	9.9	
07	Edible vegetables and certain roots and tubers	59.7	51.3	53.7	55.2	45.4	59.6	53.8
08	Edible fruit and nuts	45.6	54.2	51.4	58.1	62.2	55.3	50.0
09	Coffee, tea, mate and spices		66.0	47.3	45.3	52.4	58.2	
10	Cereals	36.4	6.0		17.8	42.3		
11	Products of the milling industry	62.4	40.5	39.6	46.2	29.0	49.8	23.3
12	Oil seeds and oleaginous fruits	41.1	47.8	43.9	57.3	49.4	53.4	22.1
13	Lac; gums, resins and other vegetable saps and extracts		40.7	60.0			67.3	
14	Vegetable plaiting materials; vegetable products nesi	37.8		79.7		24.5		81.6
15	Animal or vegetable fats, oils and waxes and their cleavage products	60.5	44.9	31.8	36.3	51.4	24.4	
16	Preparations of meat		48.1	46.0		50.3	47.4	63.5
17	Sugars and sugar confectionery	11.6	44.0	49.3	53.0	25.8	20.9	25.1
18	Cocoa and cocoa preparations		66.9	65.0			64.1	
19	Preparations of cereals, flour, starch or milk; pastrycook products		46.2	45.4		43.0	66.9	
20	Preparations of vegetables, fruit, nuts or other parts of plants		47.6	54.3		53.9	53.6	16.5
21	Miscellaneous edible preparations	35.0	59.7	52.2	13.9	53.2	47.6	
22	Beverages, spirits and vinegar		47.6	50.4	42.8	52.2	50.6	61.7
23	Residues and waste from the food industries; prepared animal fodder	14.9	32.7	35.1			33.7	13.9
24	Tobacco and manufactured tobacco substitutes							

Source: Nguyen, Bouët, and Traoré 2020.
Note: These are import-weighted averages at the HS2 level of AVEs calculated at the HS6 level. Nesi = not elsewhere specified or included. Some HS6 labels have been shortened because they are too long to be included in this table.

SPS barriers have a less trade-impeding effect than TBTs. The simple average of SPS barriers is 44 percent; for TBTs, it is 64 percent.

The European countries have the most trade-impeding NTMs, with the simple average for SPS AVEs at 49 percent and for TBTs at 73 percent. In both cases, France, Germany, and the United Kingdom exhibit the highest simple averages. This is particularly important, given that the EU is the primary destination for African agricultural exports; the EU absorbed 36 percent of African agricultural exports in 2016–2018 according to the 2020 AATM. Many factors explain this concentration, including the high European demand for agricultural and food products, the proximity of the two continents, historical relations, and shared official languages.

When we consider the AVEs of NTMs by HS2 chapters, it is clear that SPS barriers are particularly trade-damaging in chapters that matter for Africa: (1) cocoa and cocoa preparations, (2) edible fruit and nuts, edible vegetables and certain roots and tubers, and (3) coffee, tea, mate and spices. The same is true for TBTs implemented by the seven importing countries. The simple average of the AVEs of TBTs for cocoa and cocoa preparations reaches as high as 94.4 percent (in the European countries); in coffee, tea, mate and spices, it is 89.7 percent; in edible vegetables and certain roots and tubers, 84.6 percent; and in edible fruit and nuts, 79.4 percent.

Since 2000, almost all countries around the world have adopted SPS regulations and TBTs. Many of these measures correspond to a legitimate interest of consumers in controlling the sanitary and environmental quality of imported agricultural and food products. But these measures are also a barrier to trade. All econometric studies published on the subject conclude that these measures have a globally negative impact on international trade, even if certain measures such as labeling or sanitary certifications can facilitate trade. [17]

In sum, African countries have generally adopted as many NTMs as other countries in the agriculture sector. But the impact of these measures on trade is relatively smaller than the impact of the same measures in Asia and in the biggest potential export markets (EU, United States, China, India, and Japan). NTMs adopted by the EU look especially damaging for African agricultural exports as these measures are severe in sectors where Africa is most competitive: cocoa, coffee, and tea; edible vegetables, roots and tubers; and edible fruit and nuts.

17 See Kee, Nicita, and Olarreaga 2009; Disdier, Fontagné, and Mimouni 2008; Beghin, Disdier, and Marette 2015; Ghodsi, Grübler, and Stehrer 2016a; Nguyen, Bouët, and Traoré 2020.

Table 2.11 Ad valorem equivalents of technical barriers to trade: Top 7 countries in terms of GDP, 2018 (%)

HS2	HS label	China	France	Germany	India	Japan	United Kingdom	USA
01	Live animals	43.6	113.3	91.8			81.9	
02	Meat and edible meat offal		62.2	58.4			58.7	61.1
04	Dairy produce		84.8	81.9	108.0		81.0	
05	Products of animal origin	47.9	92.8	88.5	91.0		100.1	
06	Live trees and other plants		74.6	78.1	20.0	97.4	78.0	
07	Edible vegetables and certain roots and tubers	87.0	71.4	97.1	85.8		93.4	73.1
08	Edible fruit and nuts		84.6	78.7	90.9		78.8	64.2
09	Coffee, tea, mate and spices		84.4	95.4	78.4		100.7	
10	Cereals		8.9	4.1	-32.9		95.0	
11	Products of the milling industry	24.7	28.5		6.2	77.6	83.8	17.6
12	Oil seeds and oleaginous fruits	68.6	38.7	40.3			65.8	38.7
13	Lac; gums, resins and other vegetable saps and extracts	81.8	75.0	76.0	84.1		94.8	
14	Vegetable plaiting materials; vegetable products nesi	88.7	68.2	77.1		-12.5	91.0	
15	Animal or vegetable fats, oils and waxes and their cleavage products	63.3	63.6	59.2	69.7	19.4	57.2	44.5
16	Preparations of meat	95.8	62.3	59.5			57.1	94.1
17	Sugars and sugar confectionery	77.5	46.1	45.2	83.0	79.7	67.3	63.8
18	Cocoa and cocoa preparations		90.5	98.3				
19	Preparations of cereals, flour, starch or milk; pastrycook products		87.7	94.9		94.6	79.3	20.3
20	Prep. of vegetables, fruit, nuts or other parts of plants	62.1	76.7	79.5	33.1		85.6	58.3
21	Miscellaneous edible preparations	62.0		86.4	17.3		30.3	
22	Beverages, spirits and vinegar		77.7	75.7		30.0	65.5	55.8
23	Residues and waste from the food industries; prepared animal fodder	78.2	49.3	49.2		42.4	69.7	18.0
24	Tobacco and manufactured tobacco substitutes	62.2		113.9			71.9	52.2

Source: Nguyen, Bouët, and Traoré 2020.
Note: These are import-weighted averages at the HS2 level of AVEs calculated at the HS6 level. Nesi = not elsewhere specified or included. Some HS6 labels have been shortened because they are too long to be included in this table.

There is an important pitfall here for poor countries and especially African countries. Estimates of the effect of NTMs on imports are an average effect vis-à-vis all exporting countries (Nguyen, Bouët, and Traoré 2020; Ghodsi, Grübler, and Stehrer 2016a). However, these measures may facilitate imports from countries where firms are better able to modify their operations to comply with SPS regulations, while impeding imports from countries where firms have more difficulty meeting such standards. In the case of Europe, there is evidence of a slightly positive, but not significant, impact on agrifood imports from rich countries, and a significantly negative effect on agrifood imports from poor countries (Disdier, Fontagné, and Mimouni 2008).

It should also be noted that NTMs could diminish the effectiveness of trade agreements such as the African Continental Free Trade Area, if negotiations focus only on tariff reductions, and do not include measures to harmonize NTMs or implement mutual recognition. NTMs are therefore a key issue for African countries' agrifood exports, both in terms of intracontinental trade and Africa's trade relations with the rest of the world.

Finally, it is worth mentioning that African countries often discriminate against domestic producers, especially through taxes on inputs and other programs initially designed to support local agriculture. This point has been observed as part of the World Bank's research project on Distortion to Agricultural Incentives (Anderson 2009), and also by the FAO's Monitoring and Analysing Food and Agricultural Policies (MAFAP) program (Balie 2016). The FAO program established country-owned systems to analyze and reform food and agricultural policies. It provided abundant evidence that some African agricultural programs altered the transmission of international price signals to farmers, even isolating local markets from the international environment, and led to higher domestic price variability.

CONCLUSION

This chapter examined Africa's participation in global agricultural trade by sector and attempted to identify the reasons for its weak participation. It also proposed new ways of presenting Africa's participation in global agricultural trade, in terms of an exchange of calories and of inputs (fertilizers, pesticides, labor, and water).

The share of Africa in world exports is increasing in the oilseeds and tobacco sectors, while it is decreasing in cocoa (a trend mainly explained by the evolution of international prices), coffee, and beverages. African countries generally have comparative advantages in the early stages of production (unprocessed products), and their exports are mainly nondiversified and specialized in exclusive commodities, that is, products for which only a few countries worldwide are competitive, whereas at the beginning of the 2000s, African countries were still nondiversified, but specialized in standard commodities. The African agriculture sector is intensive in labor, while most developed and even developing countries create value added with less labor input. In addition, the continent has become a net importer of virtual water content.

As previous AATM reports have shown, Africa's participation in world trade does not reach its potential due to distortionary agricultural and trade policies and to issues internal to Africa, including weak transport and communications infrastructure and inefficient customs procedures. In addition, public agricultural expenditures and R&D spending are insufficient in most African countries, as is investment in infrastructure to enable local sectors to meet international SPS requirements.

Although we have identified these reasons for Africa's low participation in international agricultural trade, a more precise empirical study would be needed to rank these factors and make specific policy recommendations. Such a ranking would be based first on the sensitivity of African agricultural exports to a particular variable (tariffs or TBTs, for example), which would

have to be estimated by an econometric study; and second, on the extent to which Africa is lagging behind in terms of this variable, information that is already available to policymakers: per se, this constitutes an important research project that requires significant resources.

Thus, we can already formulate some policy recommendations. For example, the relationship between African agricultural exports and agricultural import tariffs in destination countries depends not only on the elasticity of this trade to tariffs in the importing country, but also on the level of these tariffs. African agricultural exports currently have fairly good access to external markets in terms of tariffs as a result of the multiple trade preferences that have been granted. However, Africa has very inefficient customs procedures and has difficulty meeting the SPS requirements and TBTs imposed by large countries such as the EU and the United States.

In addition, we examined external factors (tariff barriers and NTMs in destination countries) and internal factors (transport and telecommunication infrastructure,[18] R&D in the agriculture sector, access to fertilizers) limiting trade. African governments obviously have much greater potential to address the internal factors than the external factors. In policy terms, the message is relatively clear: the internal factors that reduce competitiveness should be prioritized, without abandoning efforts to address external factors. In other words, investing in transport and telecommunication infrastructure, improving access to fertilizers and pesticides, and increasing R&D in the agriculture sector should top every national agenda.

A successful African Continental Free Trade Area that efficiently addresses both the tariffs and nontariff barriers still impeding intra-African trade could lead to the formation of a vast domestic market. Growth of the domestic market is also a condition for stronger participation in world markets. To support the growth of trade, customs procedures should be reformed across the continent to improve efficiency, and a continental-level initiative to improve data on intra-African trade should tackle informal cross-border trade as part of that effort. Accurate data, which are not available today, are an essential input for the formulation of appropriate policy recommendations. Only by addressing this full set of changes will the African continent be able to seize the opportunities and realize its potential comparative advantage in high value-added agricultural products.

18 See, for example, Bouët, Mishra, and Roy 2008.

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INTRA-AFRICAN AGRICULTURAL TRADE

Anatole Goundan and Getaw Tadesse

Photo by stock.adobe.com

Chapter 3

INTRODUCTION

For decades, Africa's trade integration, particularly intraregional trade, has been a major development concern. The 2014 Malabo Declaration made tripling intra-African trade in agricultural products by 2025 a central objective. And in 2018, at the 10th Extraordinary Session of the African Union in Kigali, the agreement to form the African Continental Free Trade Area (AfCFTA) was signed. Increasing intracontinental trade will require policy decisions on the free movement of people and goods and the reduction or elimination of tariffs and nontariff measures affecting trade between African countries, especially between countries of different regional economic communities (RECs). Such initiatives suggest the need to monitor the dynamics of trade among African countries, particularly for agricultural products, as a measure of intra-African trade integration.

The Africa Agriculture Trade Monitor (AATM) was launched in 2018 as an annual report monitoring the continent's progress in agricultural trade development. Chapter 3, as in the previous reports, reviews the state of intra-African agricultural trade, and provides an in-depth analysis of several agricultural products that are strategic for food security. Working from the hypothesis that total agricultural trade within Africa depends on the performance of trade in specific products, this chapter looks at how trade is affected by commodity-specific trade policies, including those related to food self-sufficiency, regulatory standards, and quality requirements.

For the sake of brevity, we focus on 10 priority primary products from the groups of cereals and pulses (rice, maize, wheat, and beans), vegetables (potatoes, onions, and tomatoes), and fruits (bananas and plantains, citrus fruit, and apples). These commodities were selected because they are major staples for Africa. For example, maize, rice, and wheat together made up about 40 percent of the daily calories consumed by Africans over the 2014–2018 period (FAO 2021). Moreover, these 10 commodities represent the major share of intra-African trade within their product group (cereals, vegetables, or fruits). Future AATM editions may cover other unprocessed and processed agricultural products.

Before presenting the commodity-specific analysis, this chapter highlights trends and patterns in intra-African agricultural trade over the 2003 to 2019 period at the aggregate level and for selected agricultural products. In the following sections, we use network approach tools to analyze intra-African trade in those 10 products, and look at the protection that tariffs and nontariff measures (NTMs) afford these products across the continent. The final section concludes.

TRENDS AND PATTERNS IN INTRA-AFRICAN AGRICULTURAL TRADE

This section explores trends and patterns in total intra-African agricultural trade and in key agricultural products. "Unpacking" agricultural trade is necessary to understand the challenges and opportunities for specific commodities.

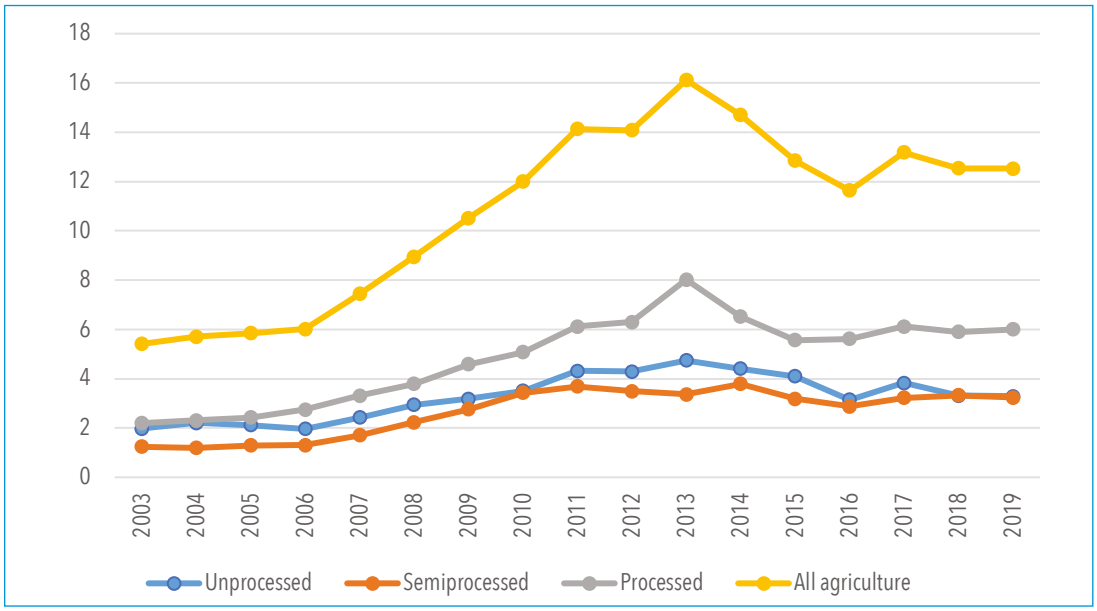
Total agricultural trade flows within Africa

Three aspects of the overall intra-African trade in agricultural products are analyzed for unprocessed, semiprocessed, and processed agricultural products. Figure 3.1a shows the value of these trade flows (expressed in US dollars). Figure 3.1b shows the share of intra-African trade in total agricultural exports, which is a measure of the relative importance of intra-African trade in total continental agricultural exports. Figure 3.1c shows the evolution of the share of intra-African trade in total African imports of agricultural products. This highlights the importance of Africa as an origin of agricultural imports for the continent.

Data on trade values for 2019, available with this year's AATM database, make it clear that agricultural trade within Africa is still struggling to recover from the sharp decline suffered from 2013 through 2016. Despite a visible recovery in 2017, the decline continued in 2018 and, slightly more slowly, in 2019 (Figure 3.1a). This decline is mainly attributed to the weakening of trade in primary products. Total intra-African agricultural trade remains below the level of 2014, and it looks unlikely that Africa will meet its goal of tripling this trade by 2025.

Despite the general trend, the value of intra-African exports of processed products has been recovering since 2016, suggesting a shift in agricultural trade within Africa from primary products to semi- or fully processed products (Figure 3.1a). This is encouraging in terms of the Malabo goal of inclusive value chain development. The growth of Africa's middle-income population may explain the increasing trade in processed products, while trade in primary products has oscillated (AfDB 2011; Ncube and Lufumpa 2014). However, fully restoring the growth in total agricultural trade will require increasing trade in processed products more rapidly.

Figure 3.1a Trends in intra-African agricultural trade, 2003–2019 (US$ billions)

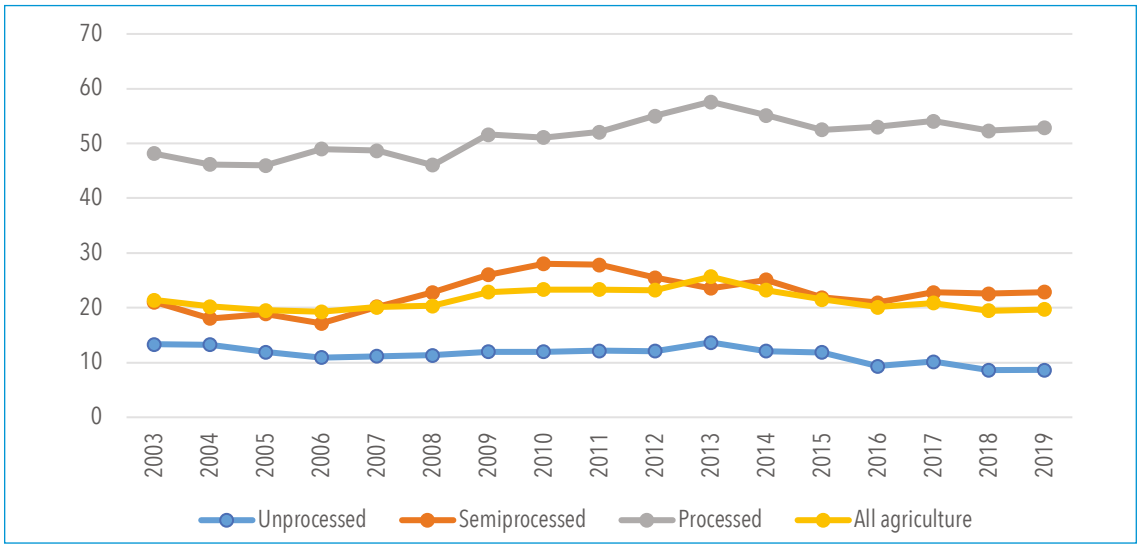


Source: Constructed using the 2021 AATM database.

Similar to the export value, the share of intra-African exports (value of intra-African exports divided by the value of Africa's total exports of agricultural products) has not yet fully recovered to the level reached in 2013 (Figure 3.1b), although it did increase in 2019 from 19.4 to 19.7 percent. The increase is larger in semiprocessed products, for which the share rose from 22.6 to 22.9 percent; and for fully processed products, for which it increased from 52.4 to 52.9 percent. This implies that the value of intra-African exports has increased more than the value of extra-African exports (see Chapter 2). Over time, the overall share of raw agricultural products decreased from 12.1 percent (2003–2007) to 9.7 percent (2015–2019). The opposite trend is observed for semi- and fully processed agricultural commodities; the intra-African share of semiprocessed exports increased from 19.1 percent (2003–2007) to 22.2 percent over the last five years, while the share of fully processed exports increased from 47.6 to 53.0 percent.

The growth in the export shares of processed products compared with unprocessed products also suggests that African markets are more attractive for processed products than primary products. The gap between the shares of intra-African exports in primary and processed products has been expanding, even during the trade downturn since 2013.

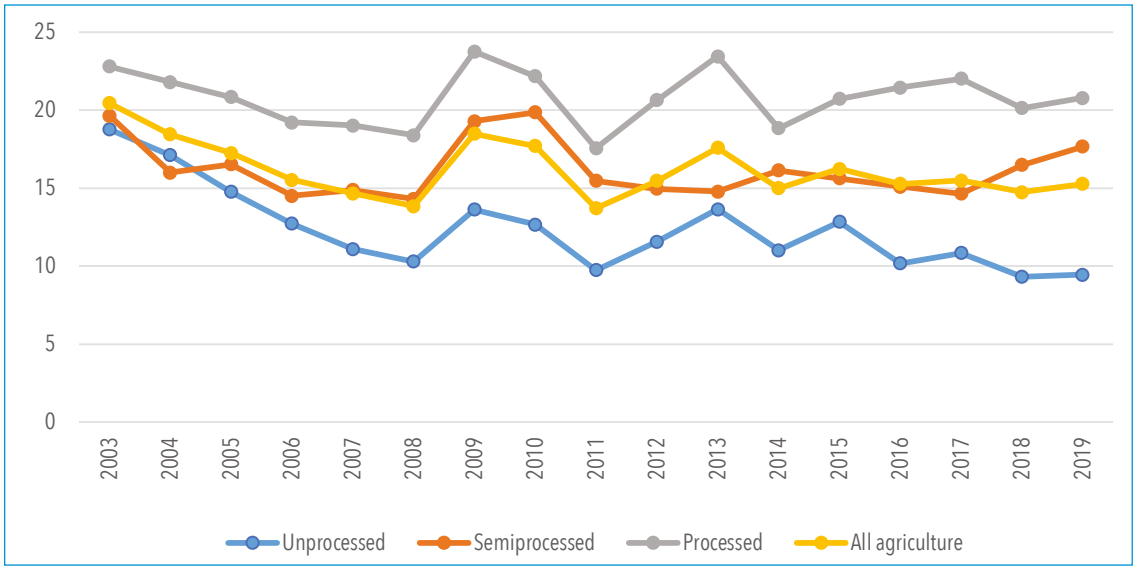
Figure 3.1b Intra-African agricultural export shares, 2003–2019 (%)



Source: Constructed using the 2021 AATM database.

Figure 3.1c reveals that, despite the important intra-African share in agricultural exports, Africa supplies less than 20 percent of continental demand for agricultural imports. Most surprising is the weak role played by African countries in supplying raw agricultural products. Indeed, the share of intra-African imports of raw agricultural products declined from about 20 percent in 2003 to 9.4 percent in 2019. Africa played a larger, though still limited, role in suppling semi- and fully processed agricultural commodities. About 15 percent of total continental imports of semiprocessed agricultural products, on average, originated in Africa, as well as about 20 percent of fully processed products. Between 2018 and 2019, the share of intra-African imports overall increased from 14.7 to 15.3 percent. This included increases in all three categories of processing: intra-African trade was up from 9.3 to 9.44 percent for unprocessed items, 16.5 to 17.7 percent for semiprocessed products, and 20.1 to 20.8 percent for fully processed agricultural products. These results suggest a continued need for transformation of agricultural value chains to reduce Africa's dependence on international markets for its food security.

Figure 3.1c Intra-African agricultural import shares, 2003–2019 (%)



Source: Constructed using the 2021 AATM database.

Intra-African trade of selected primary commodities

The definition of the 10 selected products in the Harmonized System (HS6, 2012 version) is provided in Table 3.1. We focus on cereals (HS2 code 10), vegetables (HS2 code 7), and edible fruit and nuts (HS2 code 8). These products are central to African agricultural trade. In terms of total African agricultural exports, fruits and nuts have accounted for about 20.2 percent on average (2015–2019), while vegetables have averaged 7.6 percent and cereals 1.8 percent. In terms of African imports of agricultural products, cereals account for 29.7 percent, vegetables for 3.0 percent, and fruits and nuts for 2.3 percent. In intra-African agricultural trade, they all together account for 17.1 percent, with cereals accounting for 6.7 percent, vegetables 5.6 percent, and fruits and nuts 4.8 percent.

Table 3.1 Definitions of products analyzed

Products	HS6 Code	Description
Rice	100610	Cereals; rice in the husk (paddy or rough)
	100620	Cereals; husked (brown) rice
	100630	Cereals; rice, semi-milled or wholly milled, whether or not polished or glazed
	100640	Cereals; rice, broken
Maize	100510	Cereals; maize (corn), seed
	100590	Cereals; maize (corn), other than seed
Wheat	100111	Cereals; wheat and meslin, durum wheat, seed
	100119	Cereals; wheat and meslin, durum wheat, other than seed
	100191	Cereals; wheat and meslin, other than durum wheat, seed
	100199	Cereals; wheat and meslin, other than durum wheat, other than seed
Beans	071331	Vegetables, leguminous; beans of the species vigna mungo (l.) hepper or vigna radiata (l.) wilczek, shelled, whether or not skinned or split, dried
	071332	Vegetables, leguminous; small red (adzuki) beans (phaseolus or vigna angularis), shelled, whether or not skinned or split, dried
	071333	Vegetables, leguminous; kidney beans, including white pea beans (phaseolus vulgaris), shelled, whether or not skinned or split, dried
	071334	Vegetables, leguminous; bambara beans (Vigna subterranea or Voandzeia subterranea), shelled, whether or not skinned or split, dried
	071335	Vegetables, leguminous; cow peas (Vigna unguiculata), shelled, whether or not skinned or split, dried
	071339	Vegetables, leguminous; n.e.c. in item no. 0713.3, shelled, whether or not skinned or split, dried
Potatoes	070110	Vegetables; seed potatoes, fresh or chilled
	070190	Vegetables; potatoes (other than seed), fresh or chilled
Onions and shallots	070310	Vegetables, alliaceous; onions and shallots, fresh or chilled

Products	HS6 Code	Description
Tomatoes	070200	Vegetables; tomatoes, fresh or chilled
Bananas and plantains	080310	Fruit, edible; plantains, fresh or dried
	080390	Fruit, edible; bananas, other than plantains, fresh or dried
Citrus fruit	080510	Fruit, edible; oranges, fresh or dried
	080520	Fruit, edible; mandarins (including tangerines and satsumas), clementines, wilkings and similar citrus hybrids, fresh or dried
	080540	Fruit, edible; grapefruit, including pomelos, fresh or dried
	080550	Fruit, edible; lemons (Citrus limon, Citrus limonum), limes (Citrus aurantifolia , Citrus latifolia), fresh or dried
	080590	Fruit, edible; citrus fruit n.e.c. in heading no. 0805, fresh or dried
Apples	080810	Fruit, edible; apples, fresh

Source: Authors' classification.

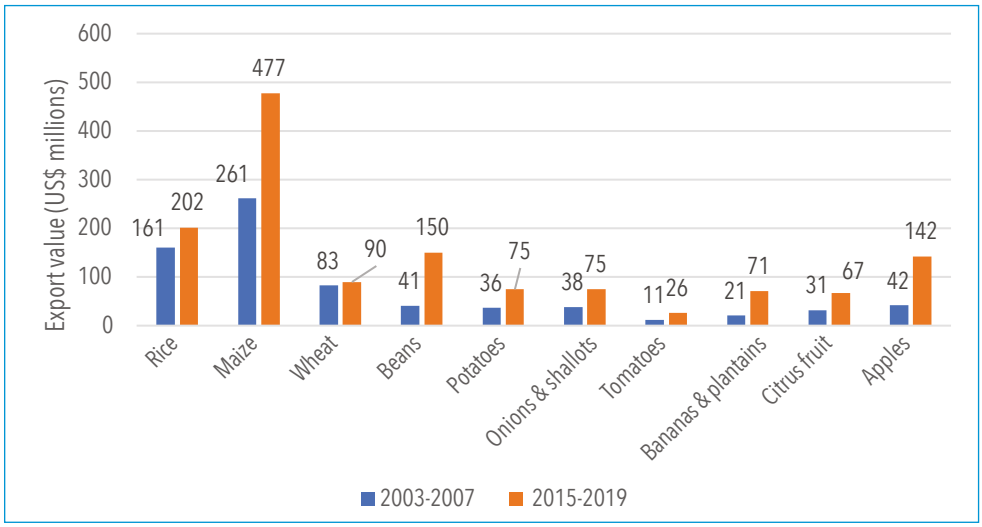
Within these three product chapters, we consider 10 primary products: rice, maize, and wheat in the group of cereals; beans, potatoes, onions and shallots, and tomatoes within vegetables; and bananas and plantains, citrus fruit, and apples in the group of edible fruit and nuts. Within cereals, the selected products constitute about 91 percent of the intra-African trade value of cereals (rice 23.6 percent, maize 56.4 percent, and wheat 10.6 percent). For vegetables, highlighted products account for 47 percent (beans 21.5 percent, potatoes 10.7 percent, onions and shallots 10.8 percent, and tomatoes 3.8 percent), while selected edible fruit and nuts make up 46 percent of the total intra-African trade of their group (bananas and plantains 11.8 percent, citrus fruit 11.07 percent, and apples 23.6 percent).

Figure 3.2 shows the average annual value of intra-African exports for the 10 products in two periods: 2003–2007, which we consider as the baseline for the Comprehensive Africa Agriculture Development Programme (CAADP), and 2015–2019, the most recent period for which data are available. Over the two periods, the *nominal* value of transactions increased significantly for all the commodities considered in the analysis. However, nominal values rose more rapidly for beans and fruits and vegetables than for cereals, with the value of Africa's trade in beans, apples, and bananas up by more than 200 percent between the two periods. The annual trade in beans increased from US$41 million in 2003–2007 to $150 million in 2015–2019.[1] Trade in the other commodities increased by about 100 percent, except for rice and wheat. For example, the annual value of trade in maize increased from $261 million to $477 million.

However, these are nominal values, so the change may not be fully attributable to an increase in the *real volume* of trade. For example, the average international price of maize was about $120 per metric ton (2003–2007), but increased to about $164 per metric ton (2015–2019). Similarly, the international price of bananas increased by 88 percent between the two subperiods and the price of rice rose 44 percent, but the price of wheat rose only 3 percent. More broadly, the international food price index increased by about 27 percent between the two subperiods (IMF 2021). Given this increase, the international price increase explains some of the change in the nominal value of intra-African trade in maize and other products. Thus, the share of trade, which we discuss next, may be a better measure than the value of trade for understanding the performance of intra-African commodity trade.

1 Throughout this chapter, "$" refers to US dollars, unless otherwise indicated.

Figure 3.2 Average annual value of intra-African trade for selected commodities



Source: Constructed using the 2021 AATM database.

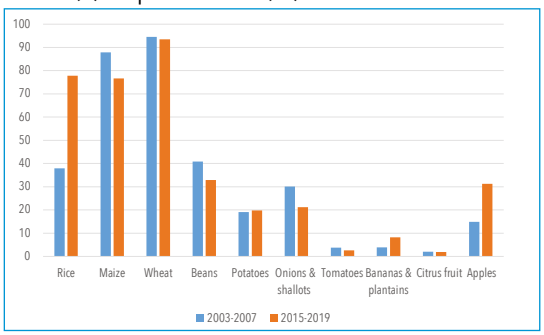
Figure 3.3 shows the size of intra-African trade relative to total African exports and imports of the selected commodities over the two periods. In 2003–2007, Africa was the major destination for African exports of cereals and beans; however, for other commodities, intra-African exports accounted for less than 30 percent of the total exports. By 2015–2019, this situation had changed. Of the 10 commodities analyzed, 6 have declined as a share of intra-African exports and increased in exports outside the continent. For maize, beans, and bananas, a larger share is now being exported to the rest of the world, while rice, apples, and bananas are increasingly traded within Africa.

Regarding the share of imports, Africa used to depend primarily on intra-African trade to meet its import demand for tomatoes and citrus fruit. For example, panel (b) of Figure 3.3 shows that about 92 percent of total continental imports of tomatoes was supplied by Africa in the 2015–2019 period. We measure *import dependence* — that is, the share of imports from the rest of the world — as 1 minus the share of intra-African trade in African total imports of a given product. Thus, the import dependence for tomatoes decreased from 18 percent (2003–2007) to 8 percent (2015–2019). Regarding citrus fruit, this dependence on imports from outside the continent increased slightly, from 22 to 24 percent between the two subperiods.

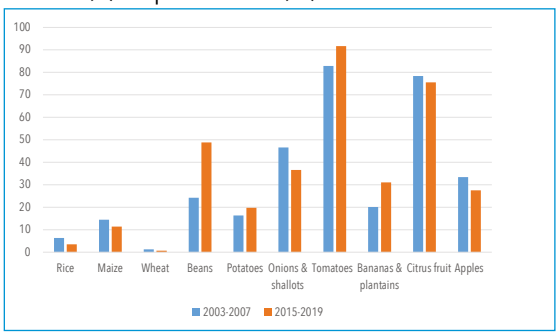
For cereals (rice, wheat, maize), however, Africa depends heavily on the rest of the world. Moreover, this dependence is increasing, not only for cereals but also for onions, citrus, and apples. The decline of intra-African trade in import shares may be attributed to several factors. First, the supply of these products in African markets may be declining relative to demand. This is likely the case for rice and apples, for which the share of imports is still declining, even as their share of exports is increasing. Second, African traders may find African markets less attractive for these products. This is the case for those products for which both export and import shares are significantly declining, like maize and onions. Third, for products including beans, tomatoes, and bananas, for which the share of imports is increasing while the export share is either increasing or decreasing, Africa is becoming better able to meet its own demand or beyond.

Figure 3.3 Share of intra-African trade in total African trade of selected commodities

(a) Export share (%)



(b) Import share (%)



Source: Constructed using the 2021 AATM database.

Note: Export or import share is the ratio of intraregional trade to total African exports or imports of each product.

Table 3.2 shows the transaction share of the top three exporters and importers, by commodity, to and from African markets. The figures in parentheses indicate the percentage share of a country in the total intra-African trade value for the commodity. The higher the percentage, the more the country dominates imports/exports of this commodity.

Table 3.2 Top intra-African exporters and importers of selected products and corresponding trade share

Product	Ranking	Top 3 exporters		Top 3 importers	
		2003–2007	2015–2019	2003–2007	2015–2019
Rice	1	EGY [43.6%]	ZAF [29.8%]	LBY [20.4%]	COD [17.2%]
	2	ZAF [26.2%]	SEN [15.5%]	BWA [11.6%]	MLI [14.1%]
	3	SEN [5.1%]	UGA [10.4%]	SDN [9.9%]	BWA [10.1%]
Maize	1	ZAF [57.2%]	ZAF [45.3%]	ZWE [32.4%]	ZWE [22.2%]
	2	ZMB [10.8%]	ZMB [21.4%]	SWZ [8.9%]	KEN [19.9%]
	3	MWI [9.2%]	UGA [13.7%]	BWA [7.5%]	BWA [8.3%]
Wheat	1	ZAF [36.2%]	ZAF [58.1%]	NGA [21.5%]	ZWE [36.0%]
	2	DZA [20.8%]	TZA [13.1%]	ZMB [10.4%]	BWA [20.0%]
	3	MOZ [9.3%]	MUS [10.9%]	BWA [9.7%]	SYC [11.7%]
Beans	1	ZAF [25.2%]	UGA [32.3%]	ZMB [9.8%]	KEN [32.8%]
	2	ETH [14.0%]	EGY [26.4%]	KEN [8.6%]	DZA [17.1%]
	3	UGA [10.7%]	ETH [8.3%]	ZWE [8.4%]	SSD [6.7%]
Potatoes	1	ZAF [50.6%]	ZAF [53.0%]	ZWE [30.5%]	SOM [21.4%]
	2	ZMB [30.5%]	ETH [24.6%]	AGO [15.9%]	MOZ [17.3%]
	3	EGY [4.8%]	MAR [5.6%]	BWA [14.4%]	NAM [10.8%]
Onions and shallots	1	NER [52.4%]	ZAF [39.7%]	GHA [37.6%]	AGO [15.5%]
	2	ZAF [25.0%]	NER [13.7%]	AGO [12.9%]	MOZ [14.7%]
	3	NAM [7.4%]	SDN [11.0%]	CIV [7.3%]	ETH [10.6%]
Tomatoes	1	ZAF [65.9%]	ETH [44.5%]	BWA [32.1%]	SOM [38.4%]
	2	BFA [11.7%]	ZAF [20.9%]	NAM [12.7%]	LBY [9.3%]
	3	ETH [6.3%]	MAR [7.8%]	GHA [10.1%]	BWA [7.0%]
Bananas and plantains	1	CIV [46.3%]	CIV [32.4%]	SEN [28.0%]	ZAF [40.5%]
	2	ZAF [24.4%]	MOZ [30.4%]	BWA [12.1%]	SEN [17.9%]
	3	CMR [6.0%]	ZAF [13.7%]	ZAF [9.0%]	BWA [7.3%]

Citrus fruit	1	ZAF [46.4%]	ZAF [40.8%]	ZAF [14.5%]	KEN [16.4%]
	2	SWZ [16.7%]	EGY [19.6%]	MOZ [13.0%]	ZAF [9.5%]
	3	EGY [11.9%]	ZWE [9.1%]	ZMB [10.1%]	MUS [9.3%]
Apples	1	ZAF [95.8%]	ZAF [97.5%]	BWA [11.6%]	NGA [30.3%]
	2	NAM [1.3%]	EGY [0.5%]	BEN [11.3%]	KEN [7.9%]
	3	EGY [0.6%]	MUS [0.5%]	AGO [10.5%]	AGO [5.7%]

Source: Constructed using the 2021 AATM database.
Note: Country labels are ISO-3 country codes. These are provided in the appendix to this chapter (Table A3.1). The figures in parentheses indicate the percentage share of a country in the total intra-African trade value for each commodity.

In the first period (2003–2007), South Africa alone supplied more than 50 percent of the intra-African export value of maize, potatoes, onions, tomatoes, and apples. More than 40 percent of the exports of rice, bananas, and citrus were likewise supplied by a single country (Egypt, Côte d'Ivoire, and South Africa, respectively). Almost all export markets were characterized by a high level of concentration: the top three exporters controlled more than 65 percent of intra-African exports. South Africa was among the three top exporters for all 10 commodities, followed by Egypt for 4 commodities. This changed little in the second period (2015–2019): The share of the first exporter shrank for all products except for wheat; and for every commodity, at least one country changed among the top three exporters. However, the top three still control more than 65 percent of total intra-African exports of each commodity.

African importers are more homogenous than exporters. None of the importers dominated intra-African imports for any commodity, and the sum of the shares of the three top importers is less than 50 percent for every product. The top three importing countries also changed significantly over the two periods. At least two new importers came to the top as new players during the second period for all commodities except bananas, for which the top importers remained the same.

Two observations can be made from looking at the top importers and exporters. First, there appears to be a significant regionalization of trade. Indeed, if a country is among the top exporters of a commodity, another country from the same region is found among the top importers. For example, when South Africa is the top exporter for a commodity, either Zimbabwe or Botswana is a top importer for the same commodity. Similarly, in the second period, Ethiopia is the top exporter of tomatoes, and nearby Somalia is the top importer. Second, the same country can be both a top exporter and top importer of the same commodity. For example, South Africa was among the top exporters and importers of citrus in the second period. This implies that regional trade is being used to bridge seasonal supply shortfalls, to accommodate differences in consumers' preferences, or take advantage of differences in product quality. In the next section, we go beyond general trade indicators to analyze the structure of trade relations and key players.

INTRA-AFRICAN TRADE NETWORK FOR SELECTED PRIMARY PRODUCTS

This section explores Africa-wide trade for the selected primary products using a social network approach. In this analytic framework, two elements are important: entities (people, firms, countries, etc.) and the relationships among them. In the language of network analysis, for our purposes, each country is called a node and the trade relationship between two nodes is a link. We use the framework to look at the global organization of trade, the position of the nodes, and the quality of the links for the 10 products. The trade relationships can be studied as a weighted

or unweighted network. In the unweighted logic, trade links are represented in a binary fashion, while the weighted network analysis accounts for the strength of the trade link, such as the value of trade flows between two selected countries. De Benedictis et al. (2014) noted that weighted network analysis is not, per se, an improvement over unweighted network analysis; rather, it tackles a different dimension of the analysis. For example, the "degree" of a node, which is the number of trading partners, provides different information than the "strength" of that node, which is the total export or import value of the trade of the selected node.

Here, as in the previous section, we focus on the average values for two time periods: 2003–2007 and 2015–2019. We use average trade flows between African partners over these five-year intervals to create the period-specific network data. Then we compare indicators between the two subperiods.

How many countries and trade links are there over time?

Examining the components of a network is important to understand how a network has evolved over time. Table 3.3 presents six basic indicators for each product: number of countries involved in the network, number of active exporters, number of active importers, number of countries that are both active exporters and importers, number of transactions, and the network density (ratio between number of realized transactions and the total possible transactions).

Table 3.3 Network properties: Counting countries and trade relationships, 2003–2007 and 2015–2019

	Number of participating countries				Total trade links	Network density
	All	Exporters	Importers	Both		
Rice	53 [53]	44 [47]	51 [52]	42 [46]	213 [246]	0.077 [0.089]
Maize	50 [50]	35 [35]	50 [48]	35 [33]	240 [218]	0.098 [0.089]
Wheat	39 [46]	25 [37]	34 [40]	20 [31]	74 [114]	0.050 [0.055]
Beans	54 [51]	39 [37]	53 [51]	38 [37]	223 [205]	0.078 [0.08]
Potatoes	50 [51]	36 [32]	46 [48]	32 [29]	164 [132]	0.067 [0.052]
Onions and shallots	52 [51]	34 [36]	49 [49]	31 [34]	191 [148]	0.072 [0.058]
Tomatoes	49 [47]	31 [28]	46 [39]	28 [20]	113 [96]	0.048 [0.044]
Bananas and plantains	46 [44]	31 [29]	41 [41]	26 [26]	98 [82]	0.047 [0.043]
Citrus fruit	54 [48]	33 [31]	53 [47]	32 [30]	197 [146]	0.069 [0.065]
Apples	52 [51]	27 [34]	50 [51]	25 [34]	119 [122]	0.045 [0.048]

Source: Constructed using the 2021 AATM database.
Note: The first figures indicate the values over the period 2015–2019; the figures in parentheses indicate the corresponding value for 2003–2007.

These networks evolved over the period 2003 to 2019, with the average number of countries active in trade of each commodity (importing or exporting) ranging from 44 to 54. This suggests that almost all African countries have at least one trade relationship with another African country for the selected products. In terms of exporting countries, results show that the rice network has the largest number of exporters, with 44 countries involved in 2015–2019 and 47 countries in 2003–2007. Intra-African wheat trade has the fewest exporters in the second period (25 countries exporting), while the tomato trade had the fewest (28 countries) in the first period. The number of exporting countries decreased between the subperiods for rice, wheat, and onions and shallots.

On the import side, except for wheat in the second period, at least 40 countries have participated in intra-African trade of the selected products as importers. As shown in the standard analysis in the previous section, most African countries participate as both exporters and importers of these

products. This finding here corroborates the evidence that regional trade is being used to bridge seasonal supply shortfalls and to exploit comparative advantages in product quality.

Another important metric in the network analysis is the number of trade relationships (links) among countries. Among the 10 selected products, the average number of bilateral trade links varied from 82 (for bananas and plantains) to 246 (for rice) in 2003–2007, and from 74 links (for wheat) to 240 (for maize) in 2015–2019. Except for rice, wheat, and apples, the number of trade links increased between the two periods; links increased the least for beans, up by 9 percent, and the most for citrus fruit, up by 35 percent. For apples, rice, and wheat, the average number of links decreased by 2, 13, and 35 percent, respectively. The significant increase in links for most of the products considered implies that African countries are becoming more connected.

Another metric for gauging the relationships in a network is the *network density* (or *dimensionality*). This indicator, which is the ratio of the number of realized links to the number of possible links among nodes in the network, is comparable across different networks. Our results show that for 2003–2007, the intra-African network density varied between 4.3 and 8.9 percent for the products considered (Table 3.3). In the more recent period, this indicator increased slightly, ranging from 4.5 to 8.9 percent. In the first period, the least-dense trade network was that of bananas and plantains; the densest networks were for rice and maize. In 2015–2019, the apple network was the least dense; and the maize network had the highest density score.

The 10 product networks are characterized by very low dimensionality, meaning that compared with the number of possible trade links, there are few actual (realized) intra-African trade relationships. For example, the rice network involved 53 countries, with only 213 links observed on average in 2015–2019, in comparison with 2,756 potential transactions (53x52, since each country has 52 potential African partners). This could mean either that very few countries are exporters or that most exporters have few African partners. In fact, only 4 rice-exporting countries had more than 10 partners within Africa in this period, including South Africa with 22 links. Thus, even if the number of links is increasing over time, the network density remains low. This implies that the trade potential among African countries is not yet sufficiently exploited, perhaps because of barriers to entry in terms of quality or competitiveness.

Trade orientation

In this section, we explore the types of links in the networks using several indicators. The first is the *reciprocity index*, which measures the share of two-way trade within each network. Estimates of this indicator show that the propensity for two-way trade between countries varies by commodity. For example, for 2015–2019, the reciprocity index was only 0.067 for apples, meaning that only about 7 percent of apple trade links between African countries were reciprocal. However, the maize and beans networks, which had the highest reciprocity scores, both scored about 0.4 over the two subperiods. In other words, about 40 percent of maize and beans trade were two-way trade flows. Results also suggested that the share of two-way trade within each network declined over time for most products considered, except rice and tomatoes.

The second indicator is the *clustering coefficient*, which measures the frequency of trade triangles in a network (three nodes linked to each another). The analysis for Africa shows a high clustering coefficient, indicating that trade partners of a given country are also more likely to trade among themselves. However, across products and periods, results were not similar. Over the two subperiods, the most clustered network was the maize network, while the least clustered networks were for bananas and plantains and apples in the first period, and for apples in the second period. Five networks (rice, wheat, potatoes, onions and shallots, and bananas and plantains) became more clustered from the first to the second period. This suggests that these networks have expanded over time, especially as new trade links were formed between

countries. For other products, however, the clustering coefficient has decreased, meaning that a significant number of trade relationships disappeared.

The third indicator is the *regional homophily index*, which measures the possibility (extent) of nodes from the same geographic region connecting among themselves. We looked at five regions: Central, East, North, Southern, and West Africa (see network representations in Figures 3.4 to 3.7 and those in the chapter appendix). A positive score indicates a greater chance of connection among nodes (countries) from the same region, while a negative score suggests a greater chance of connection among nodes from different regions. Our results show that African countries are likely to trade more with partners within their regions than with partners in other parts of Africa, that is, regional homophily. This is true for all 10 product networks. Over the first period, the networks showing the greatest regional homophily were tomatoes, wheat, potatoes, and onions and shallots. During the second period, wheat, bananas and plantains, and rice had the highest regional homophily scores. This means that intra-African trade of agricultural products is regionally segmented. Only a few countries have trade relationships with countries outside their geographic regions.

The final indicator measures *degree assortativity* in a network. In assortative networks, highly connected countries tend to link to other highly connected nodes. In disassortative networks, conversely, countries with many partners tend to connect to those with very few partners. The coefficient ranges from −1 to +1, with a positive value indicating an assortative network and a negative value indicating a disassortative network. Our results for this indicator show all 10 networks are disassortative, meaning that well-connected African countries are linked to poorly connected nodes, and vice versa. For example, South Africa, the most highly connected country, exports maize to 41 African countries, while most other maize-exporting countries export to fewer than 5 countries.

Table 3.4 Network properties: Reciprocity, clustering coefficient, homophily, and degree assortativity, 2003–2007 and 2015–2019

	Reciprocity index	Clustering coefficient	Regional homophily	Degree assortativity
Rice	0.376 [0.317]	0.348 [0.333]	0.452 [0.354]	0.243 [-0.252]
Maize	0.408 [0.459]	0.365 [0.373]	0.362 [0.373]	-0.149 [-0.207]
Wheat	0.270 [0.333]	0.332 [0.316]	0.504 [0.455]	0.022 [-0.166]
Beans	0.404 [0.449]	0.320 [0.367]	0.317 [0.42]	-0.118 [-0.131]
Potatoes	0.293 [0.303]	0.284 [0.216]	0.364 [0.453]	-0.174 [-0.211]
Onions and shallots	0.314 [0.338]	0.328 [0.222]	0.369 [0.445]	-0.140 [-0.255]
Tomatoes	0.266 [0.229]	0.222 [0.239]	0.365 [0.492]	-0.275 [-0.234]
Bananas and plantains	0.204 [0.293]	0.283 [0.166]	0.502 [0.419]	-0.244 [-0.24]
Citrus fruit	0.223 [0.247]	0.234 [0.242]	0.188 [0.252]	-0.336 [-0.324]
Apples	0.067 [0.246]	0.150 [0.167]	0.213 [0.341]	-0.406 [-0.378]

Source: Constructed using the 2021 AATM database.
Note: The first figures indicate the values over the period 2015–2019; the figures in parentheses indicate the corresponding value for 2003–2007.

Market concentration in intra-African trade

Here, we examine the extent of market concentration in intra-African trade for the selected products. Table 3.5 presents the cumulative share of the top 10 trade flows for each product, and the top three country-pairs (exporter-importer), with the corresponding trade share indicated in parentheses.

Table 3.5 Largest trade flows within Africa

Product	Period	Share of top 10 flows (%)	Top 3 country pairs (exporter-importer) and trade shares		
			1	2	3
Rice	(1)	64.4	EGY-LBY (20.4)	ZAF-BWA (11.6)	EGY-SDN (9.4)
	(2)	67.2	SEN-MLI (13.3)	ZAF-BWA (10)	RWA-COD (9.9)
Maize	(1)	62.7	ZAF-ZWE (15.5)	ZAF-SWZ (7.7)	ZAF-BWA (7.4)
	(2)	59.3	ZMB-ZWE(10)	UGA-KEN (8.2)	ZAF-BWA (7.9)
Wheat	(1)	70.0	DZA-NGA (18.3)	ZAF-BWA (9.6)	ZAF-ZMB (9.2)
	(2)	88.3	ZAF-BWA (20)	ZAF-ZWE (19.4)	TZA-SYC (11.5)
Beans	(1)	43.6	ZAF-ZWE (6.2)	EGY-TUN (5.8)	UGA-KEN (5.2)
	(2)	68.6	UGA-KEN (24.9)	EGY-DZA (16.9)	UGA-SSD (5.3)
Potatoes	(1)	88.5	ZMB-ZWE (30.4)	ZAF-BWA (14.4)	ZAF-AGO (13.6)
	(2)	77.9	ETH-SOM (20.8)	ZAF-MOZ (16.9)	ZAF-NAM (10.8)
Onions and shallots	(1)	79.5	NER-GHA (36.5)	ZAF-AGO (8.1)	NER-BEN (6.3)
	(2)	68.8	ZAF-MOZ (14.7)	ZAF-AGO (13.7)	SDN-ETH (10.5)
Tomatoes	(1)	84.3	ZAF-BWA (32)	ZAF-NAM (12.6)	BFA-GHA (10)
	(2)	83.3	ETH-SOM (38.2)	ZAF-BWA (7)	TUN-LBY (6.5)
Bananas and plantains	(1)	79.1	CIV-SEN (28)	ZAF-BWA (12)	ZAF-NAM (7.8)
	(2)	82.7	MOZ-ZAF (29.7)	CIV-SEN (15.1)	ZAF-BWA (7.1)
Citrus fruit	(1)	68.4	SWZ-ZAF (14)	ZWE-ZMB (9.8)	ZAF-MOZ (9.5)
	(2)	51.2	ZWE-ZAF (8.6)	TZA-KEN (7.7)	ZAF-MUS (6.8)
Apples	(1)	73.4	ZAF-BWA (11.6)	ZAF-BEN (11.3)	ZAF-AGO (9.2)
	(2)	72.1	ZAF-NGA (29.7)	ZAF-KEN (7.9)	ZAF-AGO (5.7)

Source: Constructed using the 2021 AATM database.
Note: Country labels are the ISO-3 country codes (for the full list, see Table A3.1 in the appendix to this chapter). The figures in parentheses indicate the trade share for the selected country-pair. (1) is the first period (2003–2007); (2) is the second period (2015–2019).

For all selected products, intra-African trade is highly concentrated in a limited number of countries and transactions. The top 10 transactions accounted for 43.6 percent of the trade in beans and 88.5 percent of the trade in potatoes in the first period. In the second period, the share of the top 10 transactions in total trade ranges from 51.2 percent for citrus fruit to 88.3 percent for wheat.

For rice trade in the intra-African network, the top three transactions were exports from Egypt to Libya (20.4 percent), from South Africa to Botswana (11.6 percent), and from Egypt to Sudan (9.4 percent) in the first period. During the second period, the top bilateral trade flows of rice were from Senegal to Mali (13.3 percent), South Africa to Botswana (10 percent), and Rwanda to the Democratic Republic of Congo (9.9 percent).

For maize, South Africa was the only country exporting to the top three importing countries (Zimbabwe, Eswatini, and Botswana) in the 2003–2007 period. However, in 2015–2019, the structure of the maize trade network shifted, with Zambia and Uganda becoming important maize exporters, primarily exporting to Zimbabwe and Kenya. The maize trading relationship between South Africa and Botswana stayed strong, increasing from 7.4 to 7.9 percent of total maize trade.

For the wheat network, the trade share of the top 10 transactions increased from 70 to 88 percent between the two subperiods. South Africa is also a top player in this network, primarily exporting wheat to Botswana (9.6 percent) and Zambia (9.2 percent) in the first period, and Botswana (20 percent) and Zimbabwe (19.4 percent) in the second period. Other important wheat trading partners include Algeria and Nigeria with 18.3 percent of the wheat trade in 2003–2007, and Tanzania and Seychelles, with 11.5 percent in the second period.

For the beans network, the trade share of the top 10 transactions increased from 43 to 68 percent between the two subperiods. Uganda and Egypt are the top exporting countries, and Kenya and Algeria are the main importers. The role of South Africa in this value chain is very limited, unlike other products considered here. For potatoes, South Africa is one of top exporting countries; however, the largest transaction was between Zambia and Zimbabwe (30 percent of total potato trade) in the first period, and between Ethiopia and Somalia (21 percent) in the second period. For onions and shallots, the trade share of top 10 transactions dropped from almost 80 percent down to 69 percent between the two periods. At the country level, the top trade transactions for onions and shallots in the first period occurred between Niger and Ghana (36.5 percent), followed by South Africa and Angola (8.1 percent), and Niger and Benin (6.3 percent). Over the second period, the top bilateral traders in onions and shallots were South Africa and Mozambique (14.7 percent), South Africa and Angola (13.7 percent), and Sudan and Ethiopia (10.5 percent). In the first period, Niger was the leading exporter, while South Africa became the leading exporter in the more recent period.

The intra-African tomato statistics show that just a few transactions dominated the network. For both periods, the top 10 transactions accounted for more than 80 percent of total intra-African tomato trade. The top transactions in the first period were between South Africa and Botswana, South Africa and Namibia, and Burkina Faso and Ghana. In the later period, the top trade partners for tomatoes were Ethiopia and Somalia (38 percent of the total trade value), followed by South Africa and Botswana (7 percent), and Tunisia and Libya (6.5 percent). East African countries dominated the tomato trade in recent years, while Southern African countries were the leaders in the first period.

Bananas and plantains are staple foods for many countries in East and West Africa. For these, just 10 transactions captured 80 percent of the total trade among all African countries. Côte d'Ivoire is one of the leading exporters, with Senegal its main trade partner. This country pair accounted for 28 percent of total trade in the first period, and 15 percent in the second. Mozambique is also a leading exporter, particularly in the second period, when its exports of bananas and plantains to South Africa accounted for about 30 percent of total intra-African trade.

The citrus fruit trade network has been the most dynamic, in terms of the increase in both the number of countries involved and number of transactions (Table 3.3). From an average of 48 countries involved in the first period (with 146 links), the number of countries involved increased to 54 countries (197 links) in the second period. The top 10 citrus export relationships accounted for 68.4 percent of the average total citrus fruit export value within Africa in 2003–2007, and 51.2 percent in 2015–2019. Thus, the citrus fruit trade is among the least concentrated of the networks considered. Like all the products analyzed, the citrus fruit network is characterized by a

preference or tendency for countries to trade with others in the same region. The top three citrus transactions were between Eswatini and South Africa, Zimbabwe and Zambia, and South Africa and Mozambique in the first period; in the second period, the top trading pairs were Zimbabwe and South Africa, Tanzania and Kenya, and South Africa and Mauritius. Citrus fruit trade between African countries appears to be dominated by Southern African countries.

South Africa is the main exporter of apples to African countries. Over time, its top partners have changed. In the first period, South Africa's top partners in the apple trade were Botswana, Benin, and Angola, and in the second, Nigeria, Kenya, and Angola.

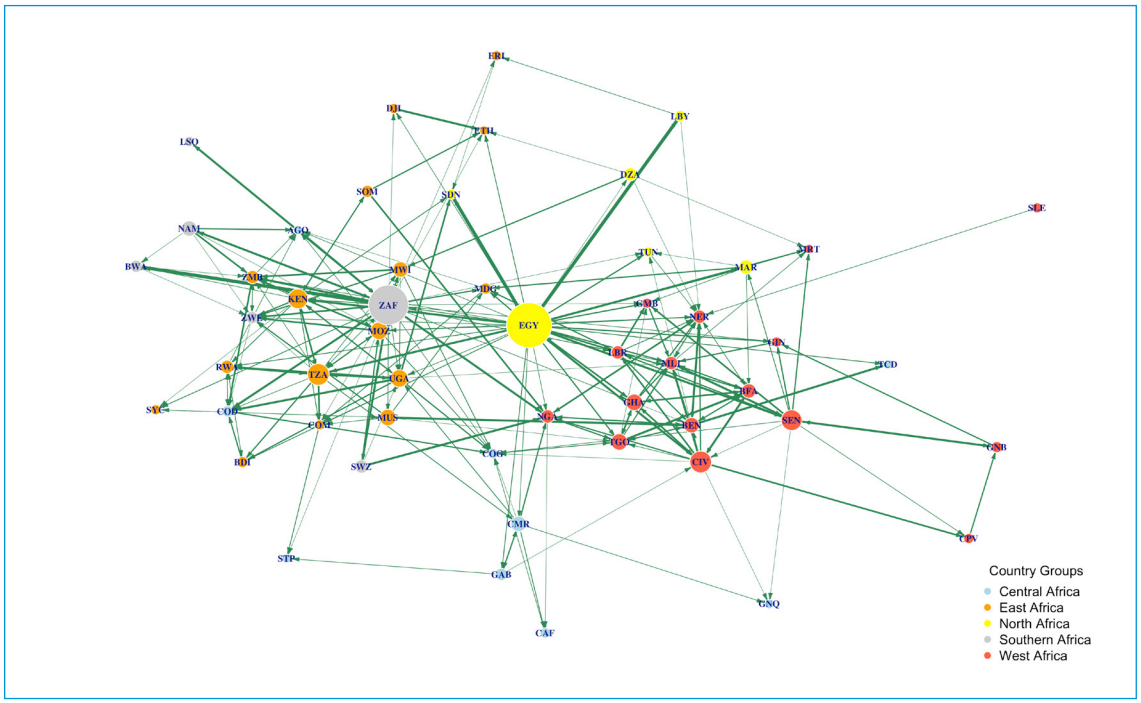
Depiction of selected networks

In this section, we complement the description of network statistics above with a graphical representation of the rice and maize networks for 2003–2007 and 2015–2019. Depictions of the other networks are found in the appendix to this chapter. Each country is represented by a node (or a vertex) in the network, while the directed and weighted edges indicate the trade fluxes between the two connected countries. The magnitude of a flow (edge weight) represents the total value of the annual average export value in current US dollars (millions) from a given country to the corresponding partner (see direction of arrows). To facilitate the reading of the network plots, we have created seven classes according to the values of the flow, thus the thinnest lines correspond to the average export values of less than $10,000 while the thickest lines correspond to the flows of more than $10 million. The size of a node is drawn proportional to the node's out-degree centrality (export value). The color of a node corresponds to its geographical position within Africa (Central, Eastern, Northern, Southern, or Western).

Figure 3.4 shows the intra-African rice export network for 2003–2007. The central role of South Africa and Egypt are indicated by the size of their circles and the number of links. Apart from these two countries, intra-African rice trade is dominated by West and East African countries (indicated by the color of the circles). Among West African countries, Côte d'Ivoire and Senegal have the most central role in this network. Among East African countries, Tanzania and Kenya were the leading exporters.

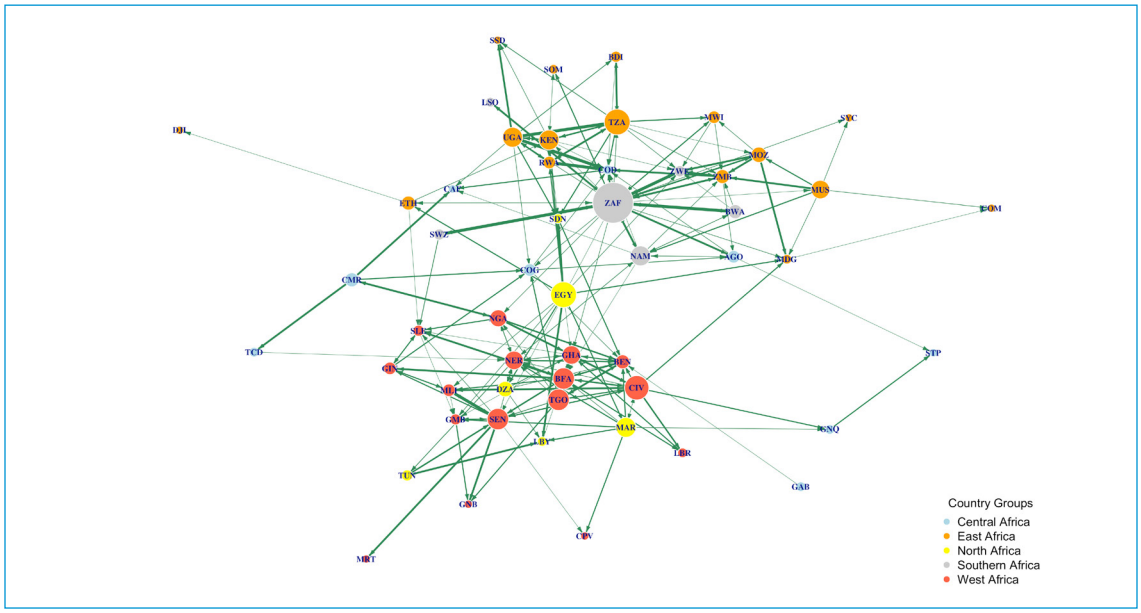
In the second period (Figure 3.5), South Africa and Egypt remain the top rice exporters. However, their dominance in the intra-African rice trade has declined. Tanzania played bigger role in this period compared to the first period, and West African rice exports also increased. However, a comparison of the network depictions for the two periods suggests that the rice trade network has become less dense.

Figure 3.4 Intra-African rice exports network, 2003–2007



Source: Constructed from the 2021 AATM database.
Note: Country codes are listed in the appendix to this chapter (Table A3.1).

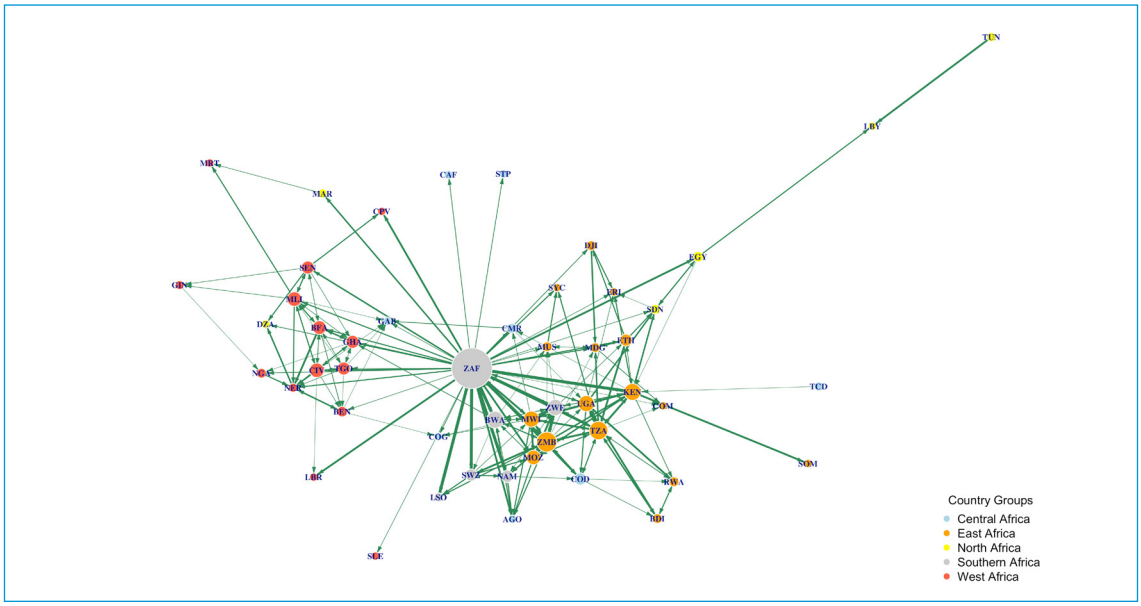
Figure 3.5 Intra-African rice exports network, 2015–2019



Source: Constructed from the 2021 AATM database.
Note: Country codes are listed in the appendix to this chapter (Table A3.1).

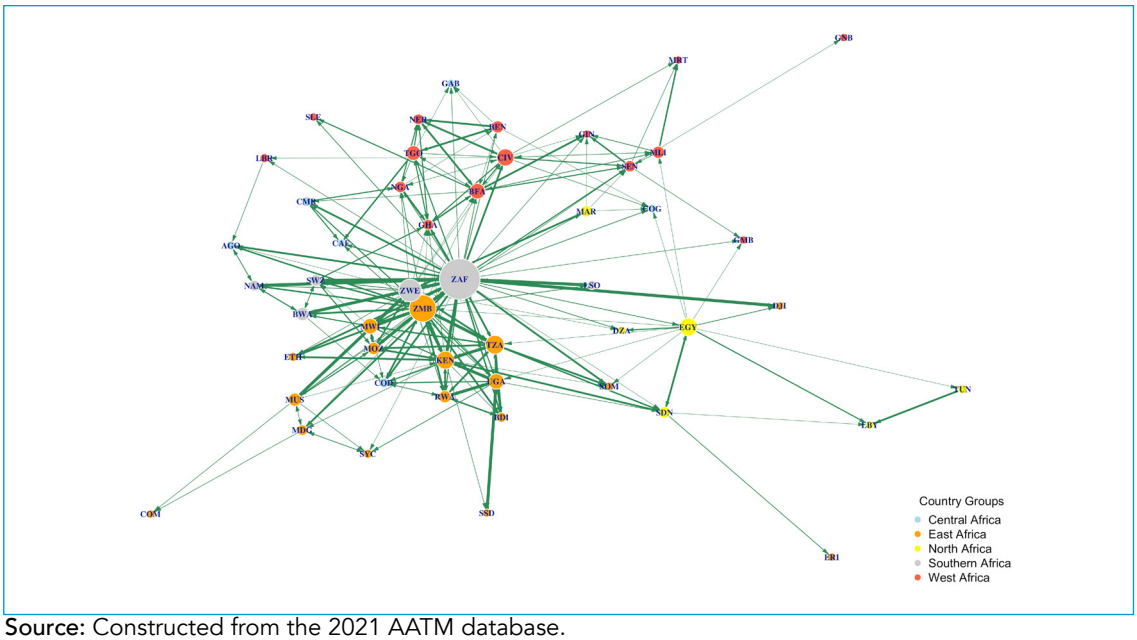
Regarding intra-African maize trade, Figure 3.6 and Figure 3.7 show that this network has been dominated by South Africa and East African countries. South Africa is the leading maize exporter in the network, followed by Zambia, Tanzania, Uganda, Kenya, and Malawi. West African countries played a less significant role; Côte d'Ivoire, Burkina Faso, and Mali were the main exporting countries in this region.

Figure 3.6 Intra-African maize exports network, 2003–2007



Source: Constructed from the 2021 AATM database.
Note: Country codes are listed in the appendix to this chapter (Table A3.1).

Figure 3.7 Intra-African maize exports network, 2015–2019



Source: Constructed from the 2021 AATM database.
Note: Country codes are listed in the appendix to this chapter (Table A3.1).

From this network-based analysis, we can see that the export networks of the selected commodities are characterized by very low density, below 10 percent. On average, 74 to 246 transactions were reported among African countries for the selected products out of more than 2,700 possible transactions per year. Agricultural trade between African countries is also found to be very concentrated, with the top 10 flows accounting for more 60 percent of the total trade value. However, despite the limited number of observed trade links between African countries, for every product about 30 percent of trade is mutual — that is, pairs of countries both import and export the product from each other. In addition, countries in the same region are more likely to trade among themselves than with countries in other African regions.

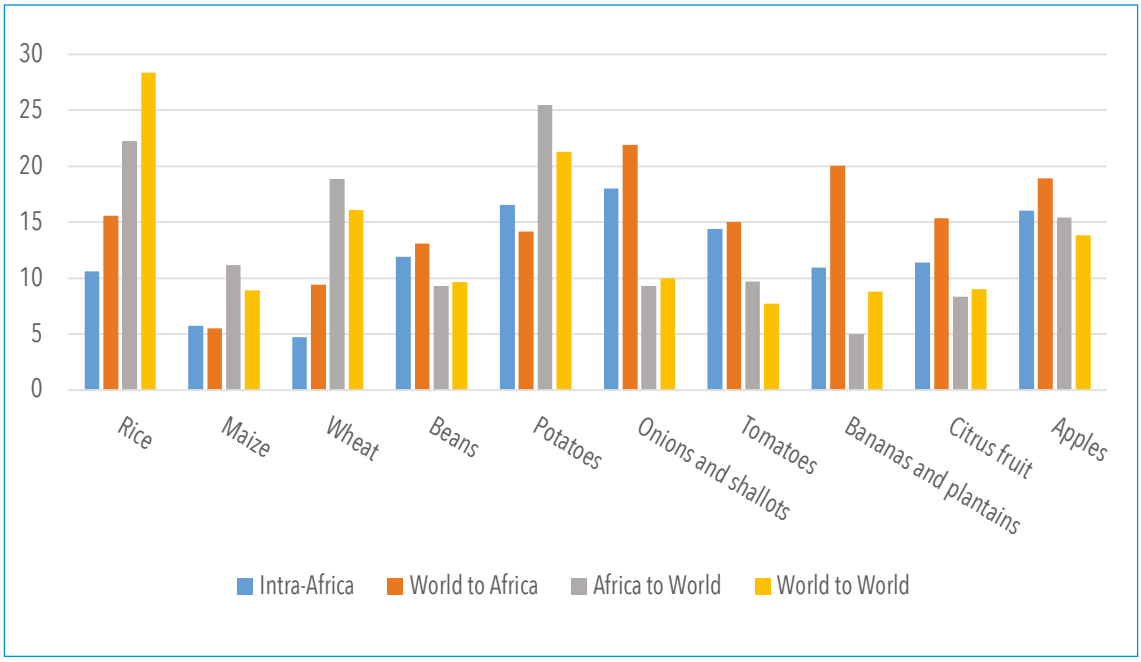
OVERVIEW OF TRADE PROTECTION WITHIN AFRICA FOR THE SELECTED PRIMARY PRODUCTS

The major types of distortion in intra-African agricultural product markets are import tariffs and nontariff measures (NTMs). This section assesses the level of protection on the selected primary agricultural commodities, beginning with the applied tariff on imports at the continental level and within RECs. We also compare the rates applied to intra-African trade with rates applied on trade between African and non-African countries.

Tariffs

Figure 3.8 compares the weighted average tariff rates imposed by (i) Africa on intra-African trade, (ii) Africa on its imports from the world, (iii) the world on its imports from African countries, and (iv) the world on its imports from the world. All countries, non-African and African, are included in what we refer to as "world." For the products considered, except potatoes and rice, the intra-African markets are subject to lower tariffs than those faced by international commodities in Africa. However, African exports to the world, with the exceptions of rice, maize, wheat, and potatoes, face lower tariffs at the international level than among African countries.

Figure 3.8 Weighted average tariff rates between Africa and the international market, 2016 (%)



Source: Constructed using MAcMap-HS6 (2016).

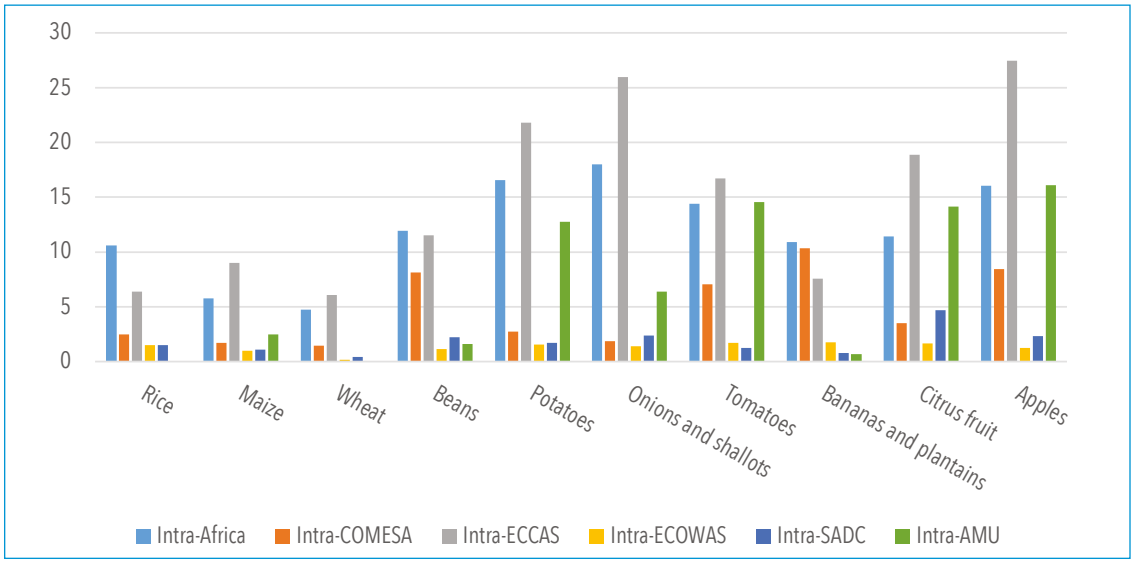
Note: "Intra-Africa" is the intracontinental weighted average tariff rate; "World to Africa" is the rate faced by imports from world markets; "Africa to World" is the average weighted tariff rate imposed on African exports by world partners; and "World to World" is the international average rate.

For rice, the intra-African tariff rate in 2016 was relatively low compared to tariff rates observed between other partners; the global weighted average tariff (World to World) on rice was 28.4 percent. Moreover, intra-African rice markets were less distorted than markets for world rice imports to Africa, with a 15.6 percent tariff, while it was 10.6 percent on African rice. Both rates are below the overall world rice import tariff rate and the 22.3 percent rate applied on African rice exports to the world.

For maize, African countries applied slightly higher tariff rates on intra-African trade (5.7 percent) than on maize imported from world maize markets (5.5 percent). Conversely, in the world market, maize from Africa is subject to tariff rates above the world market average (11.3 percent compared with a world average of 8.9 percent). Similar results are observed for wheat and potatoes (Figure 3.8).

Figure 3.9 compares the intra-African average tariff rates with the intra-REC rates. For the selected products, the continental average rate is higher than the applied rates within the RECs, except for the Economic Community of Central African States (ECCAS). This suggests that intra-REC trade is cheaper than extra-REC trade for individual countries in Africa. The applied tariffs within the ECCAS countries are the highest among those applied within RECs in Africa, particularly for maize, wheat, potatoes, onions and shallots, tomatoes, citrus fruits, and apples. Rice, maize, and wheat regional markets appear more liberal, that is, tariffs are lower, than other markets.

Figure 3.9 Weighted average tariff rates within RECs in Africa, 2016 (%)



Source: Constructed using MAcMap-HS6 (2016).
Note: COMESA = Common Market for Eastern and Southern Africa; SADC = Southern Africa Development Community; AMU = Arab Maghreb Union; ECCAS = Economic Community of Central African States; EAC = East African Community; ECOWAS = Economic Community of West African States. This figure illustrates the level of average tariffs on intra-REC trade in Africa in 2016. Since that date, there have been changes in these customs duties. For example, there are no longer any customs duties on trade in goods within ECOWAS.

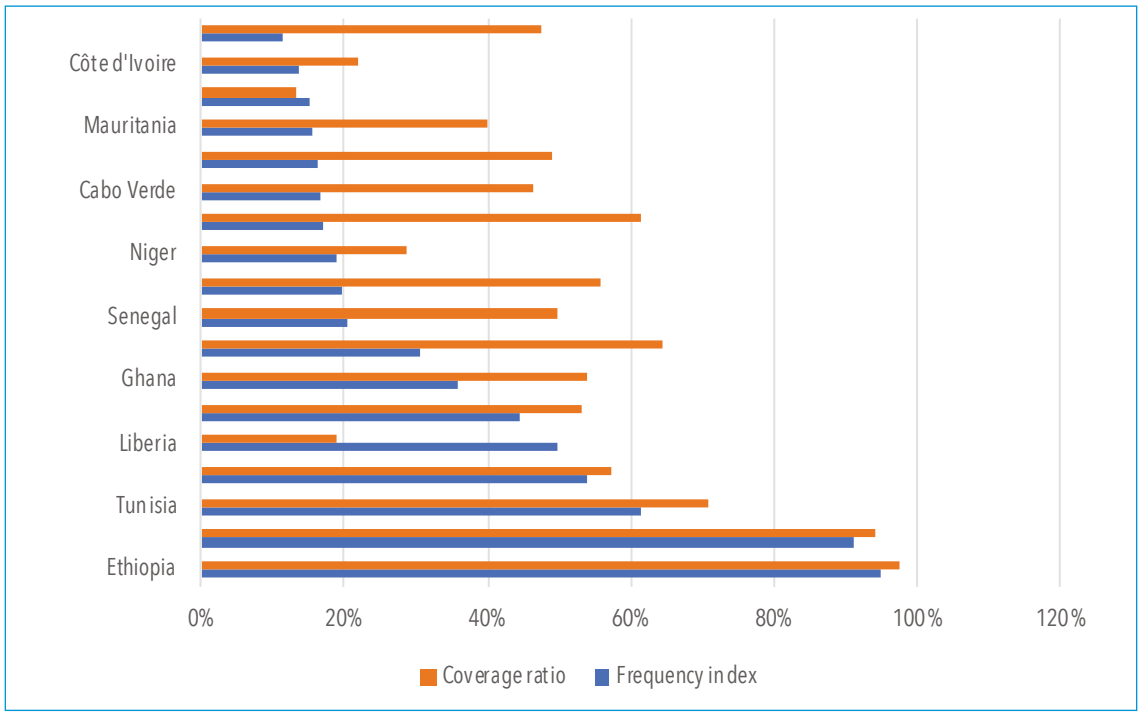
Nontariff measures

In addition to tariffs, trade protection is also provided through nontariff measures (NTMs). The most common NTMs include sanitary and phytosanitary measures (SPS), technical barriers to trade (TBT), price-control measures, quantity-control measures, and export-related measures. In general, these affect more trade flows than tariffs, and are more trade-prohibitive than tariffs (Gillson and Charalambides 2012).

In this section, we look at the three HS chapters (edible vegetables and certain roots and tubers; edible fruit and nuts; and cereals) that include our 10 selected products. Because the NTM data were not available at the HS6 product level, results in this section are presented at the more aggregated level. Figure 3.10 reports on the *frequency index* (the percentage of products subject to one or more NTMs) and the *coverage ratio* (the percentage of import value subject

to one or more NTMs), as of 2018. In Ethiopia and Nigeria, more than 90 percent of agricultural products (and import value) are affected by one or more NTMs. In Tunisia and in Algeria, more than 50 percent of agricultural products are subject to NTMs, and the coverage ratio is 71 percent in Tunisia and 57 percent in Algeria. For all other African countries for which data are available, the frequency index is less than 50 percent. However, most of these countries (Benin, Burkina Faso, Gambia, Ghana, Morocco, and Senegal) have a coverage ratio of more than 50 percent. This means that even though they apply NTMs on fewer than half of their imported products, the corresponding import value of these products is at least 50 percent of their total import value.

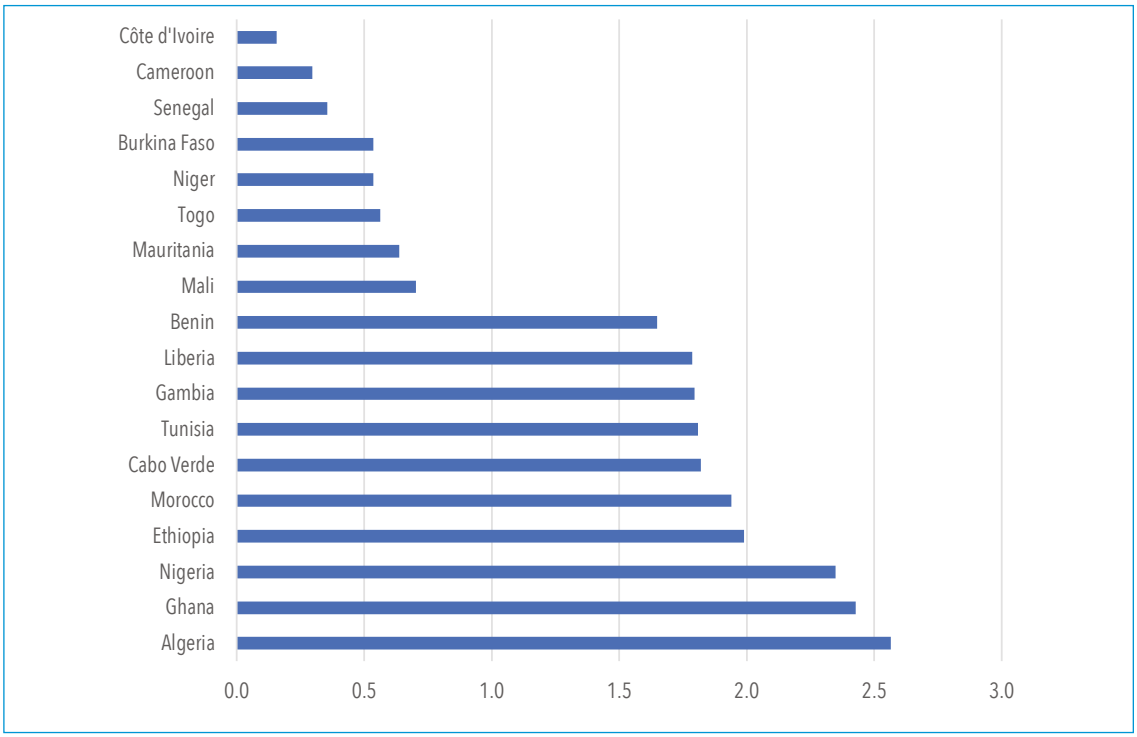
Figure 3.10 Frequency and coverage of NTMs by African country, 2018 (%)



Source: Nguyen, Bouët, and Traoré 2020.

Figure 3.11 presents the *prevalence score* (the average number of NTMs that apply to a product). Nigeria, Ghana, and Algeria have the highest prevalence scores among African countries; they apply more than two different NTMs, on average, on agricultural products. Côte d'Ivoire, Cameroon, and Senegal show the lowest prevalence scores.

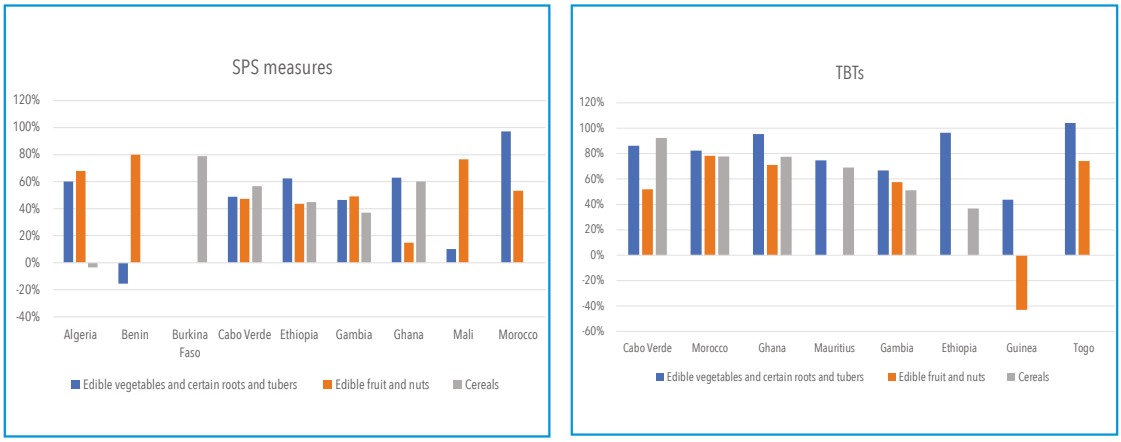
Figure 3.11 Prevalence score of NTMs by African country, 2018



Source: Nguyen, Bouët, and Traoré 2020.

Although these three indicators — frequency index, coverage ratio, and prevalence score — shed light on the use of NTMs, this information is not sufficient to assess the impact of NTMs on trade. To do so, we consider the *ad valorem equivalents* (AVEs)[2] estimated by Nguyen, Bouët, and Traoré (2020) of SPS measures and TBTs for the three HS sections (Figure 3.12). A negative AVE suggests that NTMs facilitate trade, and a positive AVE reflects a trading-reducing effect.

Figure 3.12 Ad valorem equivalents of SPS measures and TBTs in African countries, 2018 (%)



Source: Nguyen, Bouët, and Traoré 2020.

Figure 3.12 shows positive AVEs of SPS measures on edible fruit and nuts for all the countries in the sample, meaning that these measures behave as an additional tariff on the imports of edible fruit and nuts to these countries. Similar results are found for cereals, except in Algeria, and for edible vegetables, except in Benin. Therefore, for almost all countries in the sample, SPS

2 An ad valorem equivalent (AVE) is an estimation the tariff equivalent (percentage) of any fixed tariff or NTM applied on a selected product or group of products. This help to compare different trade measures.

measures do not facilitate trade with their partners, but rather constitute barriers to trade. In Morocco, the SPS requirements for edible vegetables have an effect equivalent to a 97 percent import tariff rate. In Burkina Faso, the estimated AVE of SPS measures on cereals is 79 percent.

Regarding TBTs, except for edible fruit and nuts in Guinea, the estimated AVEs are all positive and relatively high for the countries in Figure 3.12. For edible vegetables, the estimated value stands at 82 percent in Morocco, 86 percent in Cabo Verde, 95 percent in Ghana, 96 percent in Ethiopia, and 104 percent in Togo. For edible fruit and nuts, the AVE reaches 78 percent in Morocco and 74 percent in Togo. For cereals, Cabo Verde is the country with highest AVE for TBTs.

CONCLUSION

We have used this chapter to examine intra-African agricultural trade at the commodity level to understand the specific challenges and opportunities for tripling intra-African trade by 2025. In addition to updating data on trends and patterns in intra-African agricultural trade flows, the chapter focused on trade networks among exporting and importing African countries for 10 primary commodities, selected because of their importance in intra-African trade and for food security across the continent. We argue that policy challenges and interventions vary by type of commodity, as they are targeted to achieving varied development goals including food security, import substitution, and export earnings, and reaching different markets such as regional and continental markets. Thus, the 10 commodities were selected to represent products that are widely traded as raw materials and fresh products, both regionally and continentally.

Our examination of the intra-African export values and shares in total exports for primary, processed, and total agricultural exports from 2003 to 2019 showed that agricultural trade within Africa is struggling to recover from the sharp decline experienced in 2013. In 2019, the total value of intra-African agricultural trade ticked up from 2018, and the intra-African share in agricultural trade declined at a slower rate than in prior years. Unprocessed products continue to account for the largest share of the total value of exports within Africa; however, for processed products, the share of intra-African exports in total exports of processed products is much larger than the intra-African share of unprocessed product exports. Intra-African processed product trade is also growing much faster than intra-African trade in unprocessed products, a trend that is attributable to the growing number of urban and middle-class consumers in Africa. This clearly indicates the importance of focusing on processed products in order to achieve the goal of tripling of intra-African agricultural trade.

The analysis of trade flows for the selected products that represent cereals and pulses (rice, maize, wheat, beans), vegetables (potatoes, onions, tomatoes), and fruits (bananas, citrus, apples) highlighted the significant differences among the products in African export and import markets. Over recent years (2015–2019), African cereal exports (rice, maize, wheat) have been primarily to other African countries, while African destinations are of limited importance for fruit. On the import side, the African share is very low for cereals, meaning that African countries must spend a substantial amount every year to import cereals from the rest of the world. However, tomatoes and citrus fruit are mainly imported from within Africa. It is important to note that there have been significant changes between the two periods considered. These changes differ across commodities, both in direction and magnitude, suggesting the need for targeted and differentiated trade strategies and polices for the different commodities.

Further analysis of the structure of the African export and import markets for the same 10 commodities showed that African exports have been less competitive (few exporters) and more rigid than Africa's imports. For most commodities, the top three exporters account for more than

60 percent of the export values, whereas the top three importers account for less than 50 percent of imports. However, these shares are changing rapidly toward more diversified (competitive) exporters and importers. New exporters and importers are entering the continental markets, a positive trend that should be further encouraged through broadening the regional markets.

An interesting approach included in this AATM edition is the trade network analysis that explores a variety of network indicators such as density, frequency, strength, connectedness, and concentration of transactions for the selected products over the two periods. This analysis estimated the changes in the various network indicators over time for the intra-African trade. Results show that intra-African transactions for the selected products are generally becoming denser and more interconnected and regionally clustered, and new and diversified central players are entering these markets. However, the trends vary across commodities, especially in terms of connectedness. The trade networks for some commodities, including wheat, tomatoes, and apples, are still highly centralized and less connected, while the networks for others such as rice, maize, beans, and potatoes are increasingly decentralized and broader, indicating varied levels of regional and continental integration at the commodity level. This result suggests that AfCFTA can play a significant role in harmonizing these variations through commodity-specific policies. Such harmonization would not only support expanding trade integration but also diversification of commodities traded within the continent.

The analysis of import duties explains the regional preferences and clustering revealed by the network analysis. In fact, for most individual products studied and for all the RECs considered, the applied average tariff rates are very low (or zero) within each REC. This suggests that intra-REC trade is cheaper than extra-REC trade for individual countries in Africa. However, within ECCAS countries, the level of import duties is high compared to other RECs; for products such as maize, wheat, potatoes, onions and shallots, tomatoes, citrus fruits, and apples, in particular, the within–ECCAS average applied tariff rates exceed the intra-African averages.

NTMs are another impediment to intra-African agricultural trade. For countries for which data are available, our results reconfirm the findings of the 2020 AATM that, in general, NTMs cause more harm to intraregional trade than tariffs. Although tariffs have been reduced, SPS rules and TBTs imposed in their wake are slowing trade with neighboring countries and others. Thus, these NTMs need to be addressed if the continent intends to meet its goal of tripling the volume of intra-African trade.

The overall implication of the analysis reported in this chapter is threefold. First, policies affecting processed products should be revisited in order to accelerate expansion of intra-African agricultural trade in these products. A focus on trade of processed products can help meet the growing demand for food quality and convenience and expand employment. Unlike trade in primary products, trade in processed food products requires more harmonized regulatory policies related to food safety standards and information. Second, though African commodity markets are becoming wider, more competitive, and more connected, regional trade strategies and policies targeted to selected commodities are needed to exploit the potential and resolve the specific challenges to trade in these products. Third, African countries should redesign NTMs to promote, rather than hinder, intracontinental trade of agricultural products.

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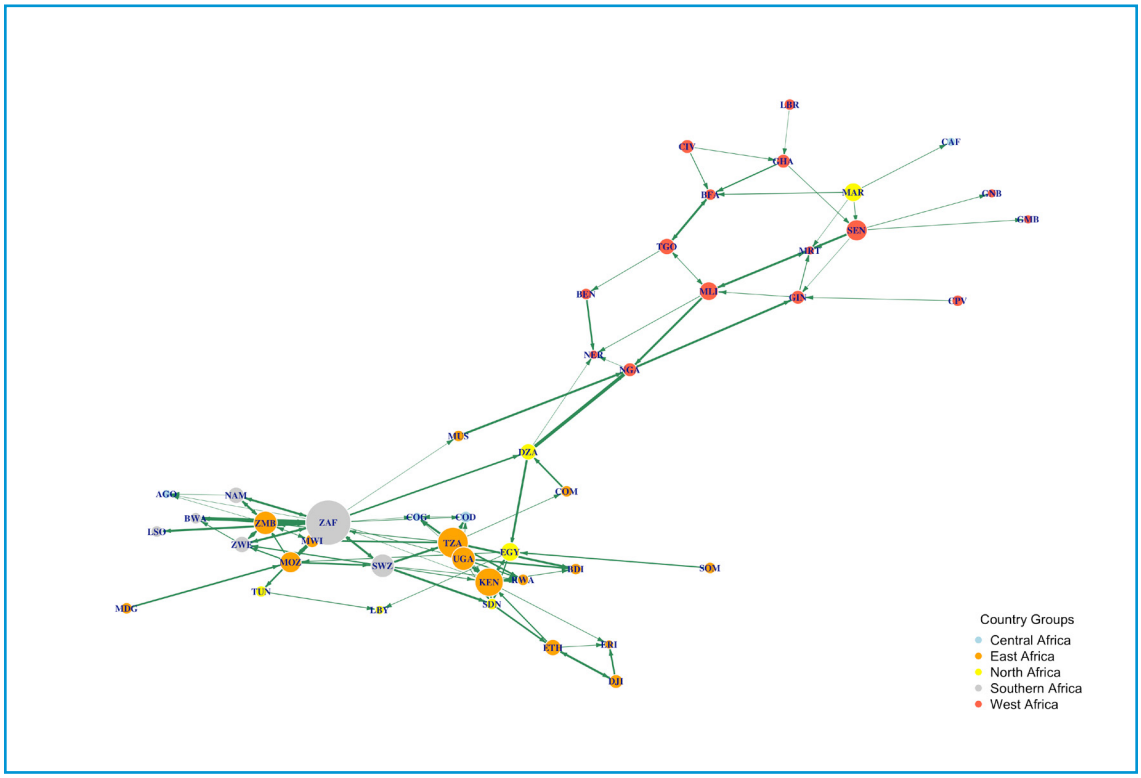
APPENDIX

Table A3 List of African country ISO-3 codes

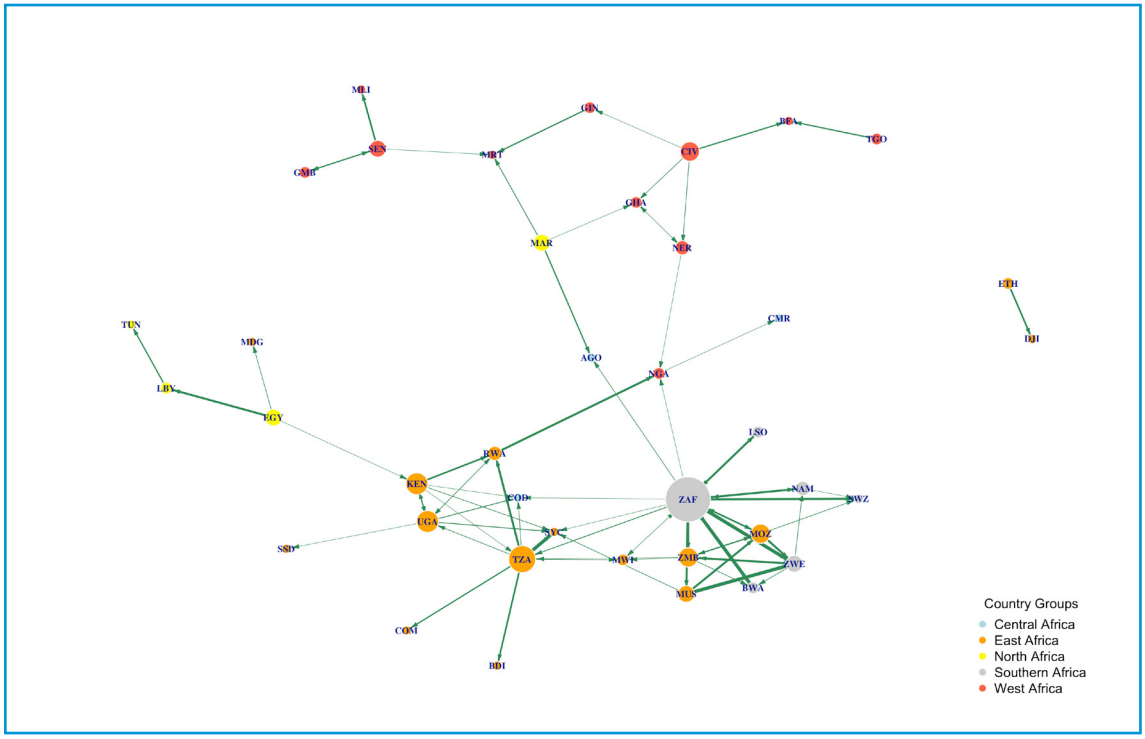
ISO3	Country Name	ISO3	Country Name
DZA	Algeria	LBR	Liberia
AGO	Angola	LBY	Libya
BEN	Benin	MDG	Madagascar
BWA	Botswana	MWI	Malawi
BFA	Burkina Faso	MLI	Mali
BDI	Burundi	MRT	Mauritania
CPV	Cabo Verde	MUS	Mauritius
CMR	Cameroon	MAR	Morocco
CAF	Central African Republic	MOZ	Mozambique
TCD	Chad	NAM	Namibia
COM	Comoros	NER	Niger
COD	Congo Dem. Rep.	NGA	Nigeria
COG	Congo, Rep.	RWA	Rwanda
CIV	Côte d'Ivoire	STP	Sao Tome and Principe
DJI	Djibouti	SEN	Senegal
EGY	Egypt, Arab Rep.	SYC	Seychelles
GNQ	Equatorial Guinea	SLE	Sierra Leone
ERI	Eritrea	SOM	Somalia
SWZ	Eswatini	ZAF	South Africa
ETH	Ethiopia	SSD	South Sudan
GAB	Gabon	SDN	Sudan
GMB	Gambia	TZA	Tanzania
GHA	Ghana	TGO	Togo
GIN	Guinea	TUN	Tunisia
GNB	Guinea-Bissau	UGA	Uganda
KEN	Kenya	ZMB	Zambia
LSO	Lesotho	ZWE	Zimbabwe

Figure A3.1 Intra-African wheat exports network, 2003–2007



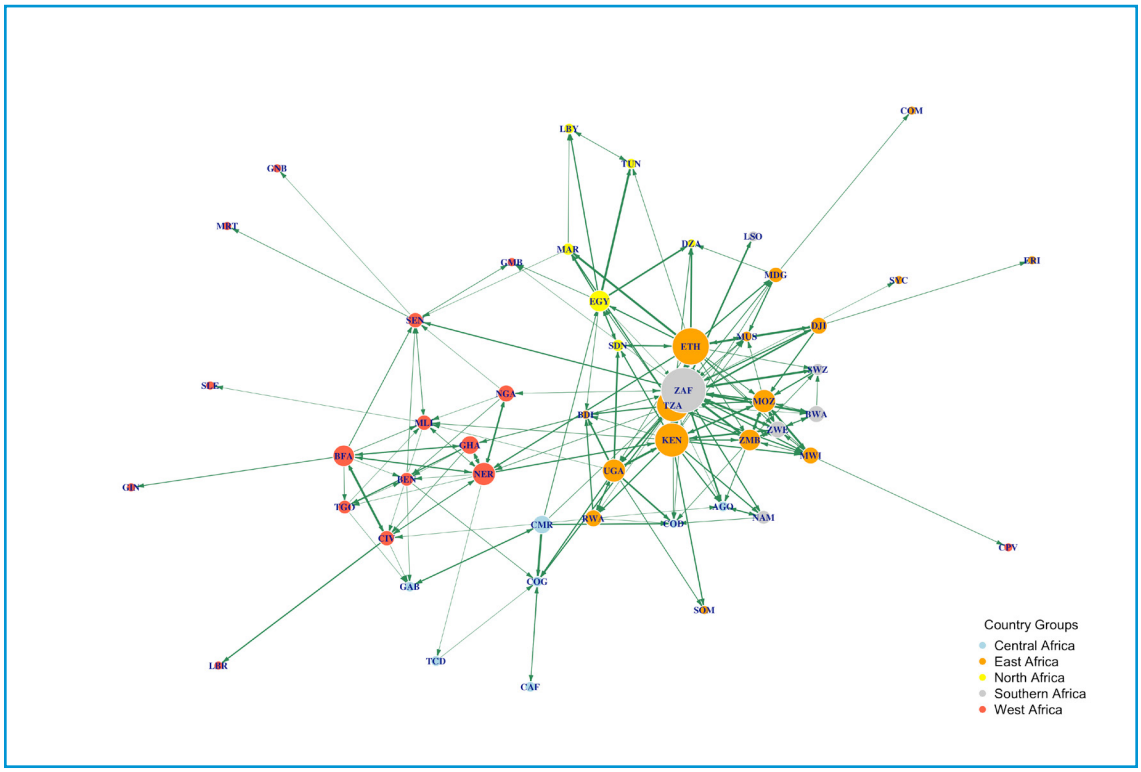
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.2 Intra-African wheat exports network, 2015–2019



Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

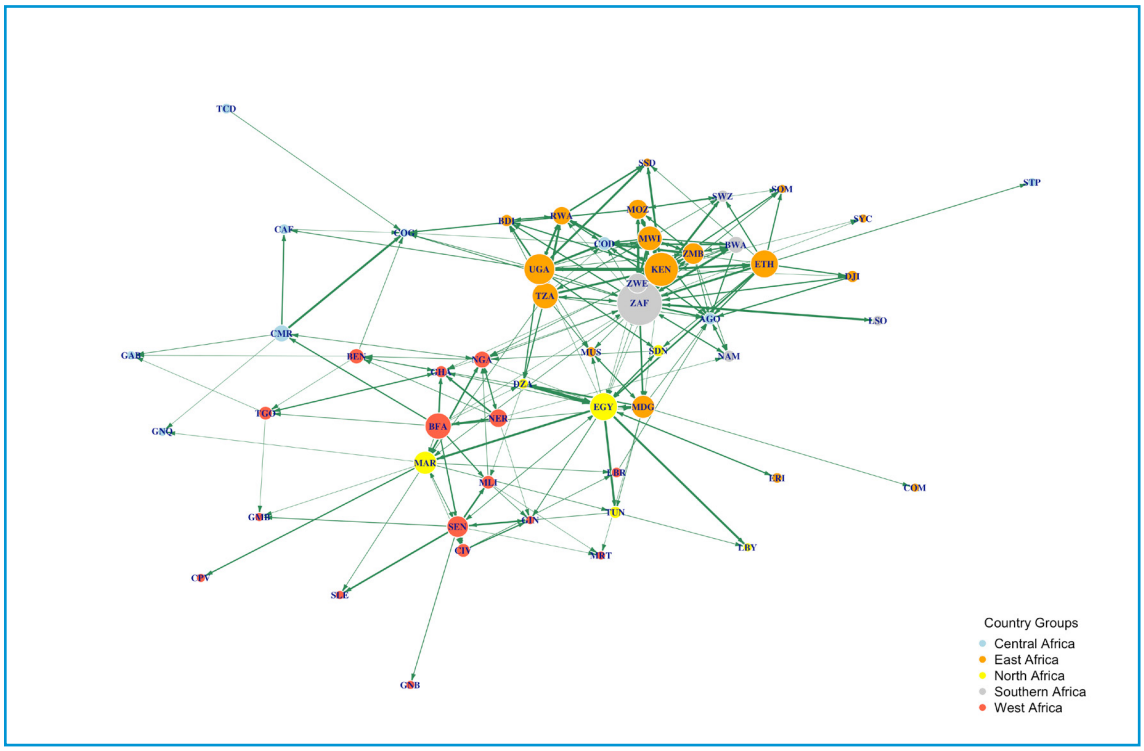
Figure A3.3 Intra-African beans exports network, 2003–2007



Country Groups
- Central Africa
- East Africa
- North Africa
- Southern Africa
- West Africa

Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

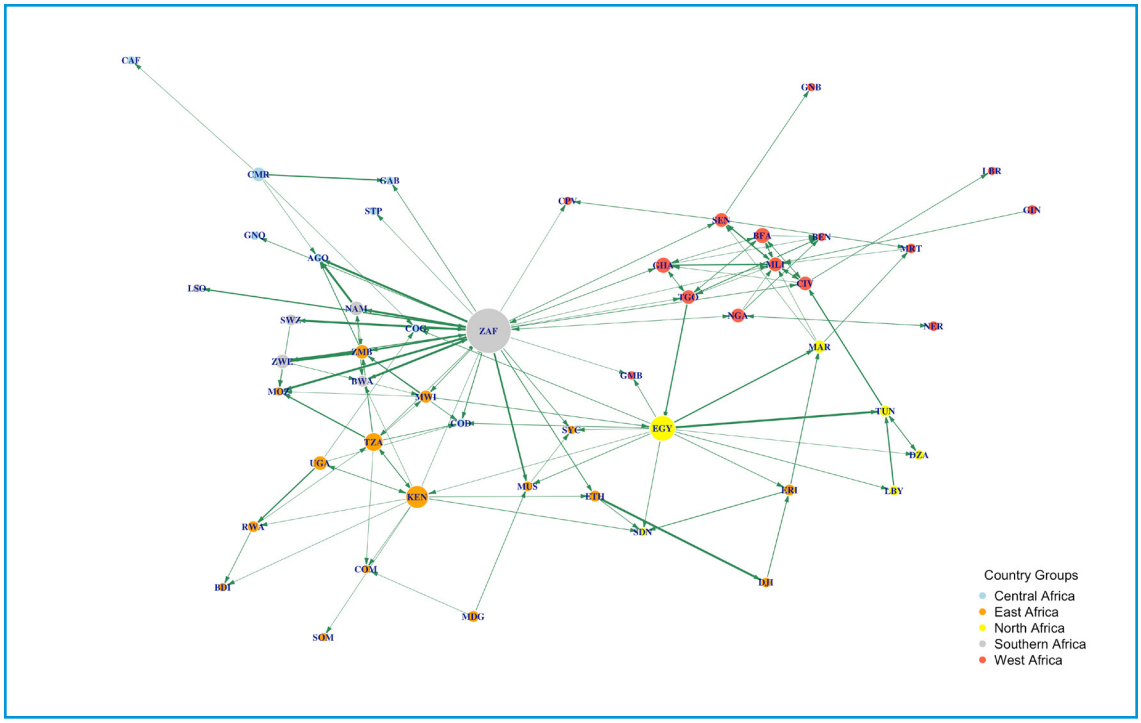
Figure A3.4 Intra-African beans exports network, 2015–2019



Country Groups
- Central Africa
- East Africa
- North Africa
- Southern Africa
- West Africa

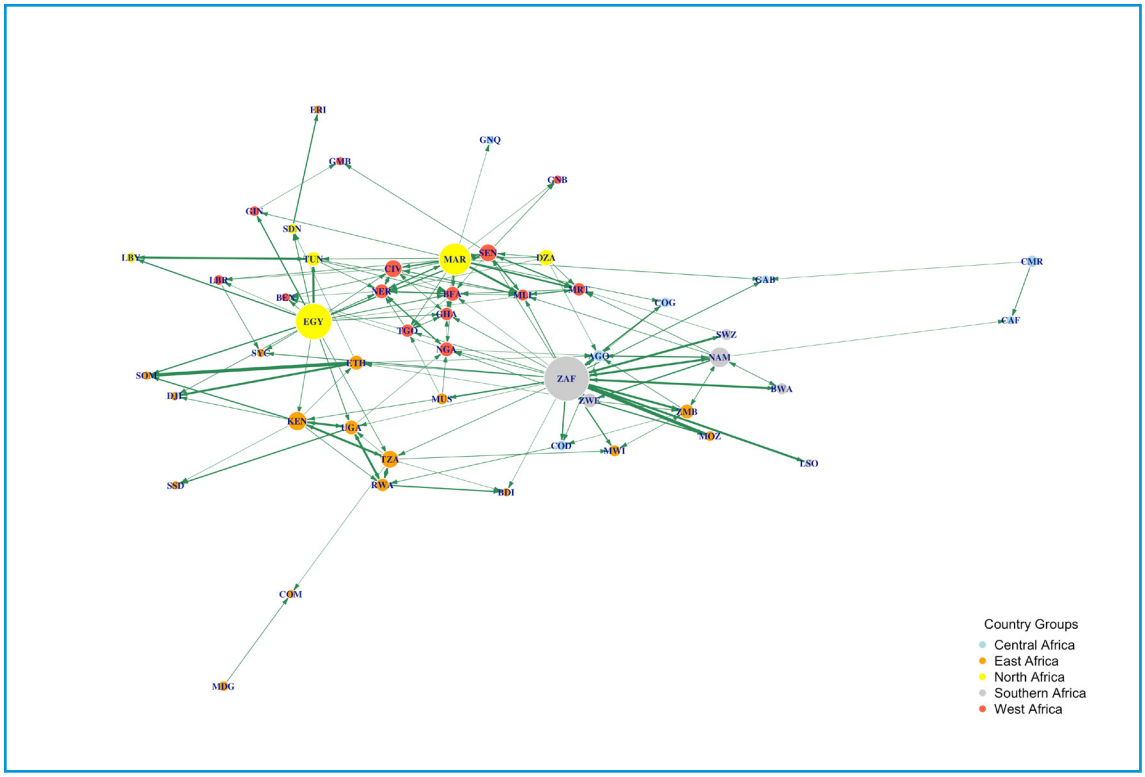
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1

Figure A3.5 Intra-African potato exports network, 2003–2007



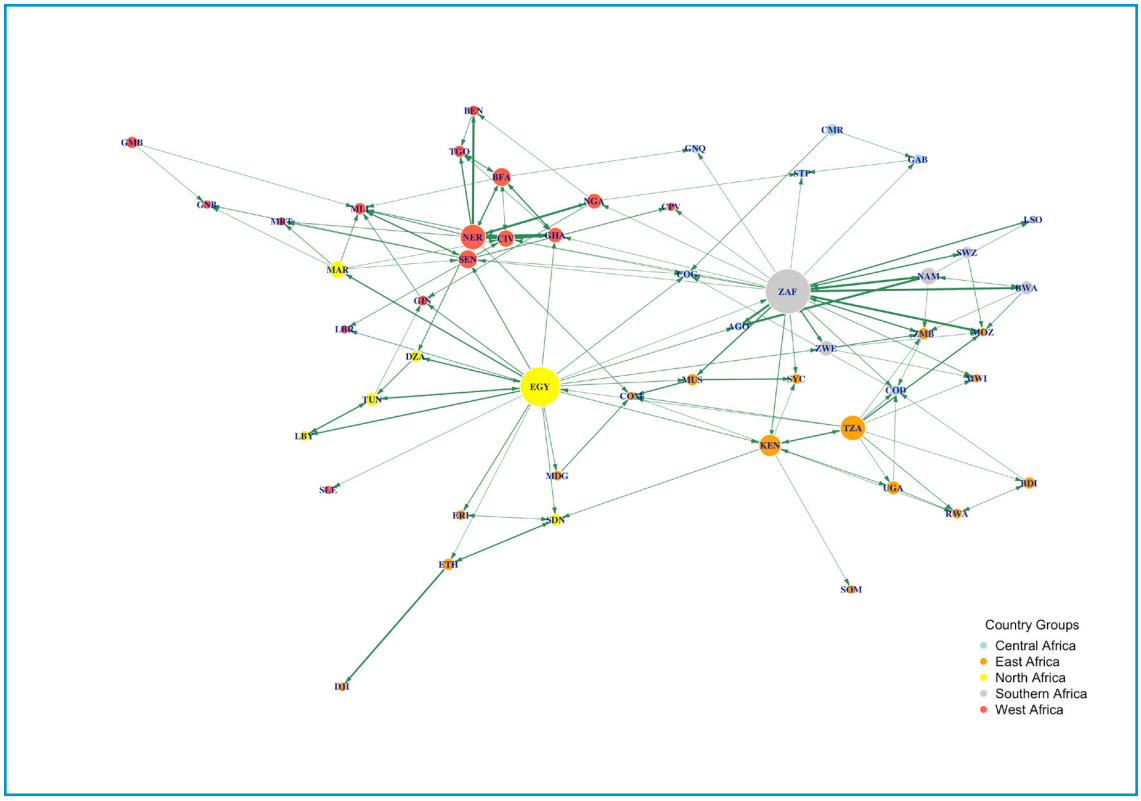
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1

Figure A3.6 Intra-African potato exports network, 2015–2019



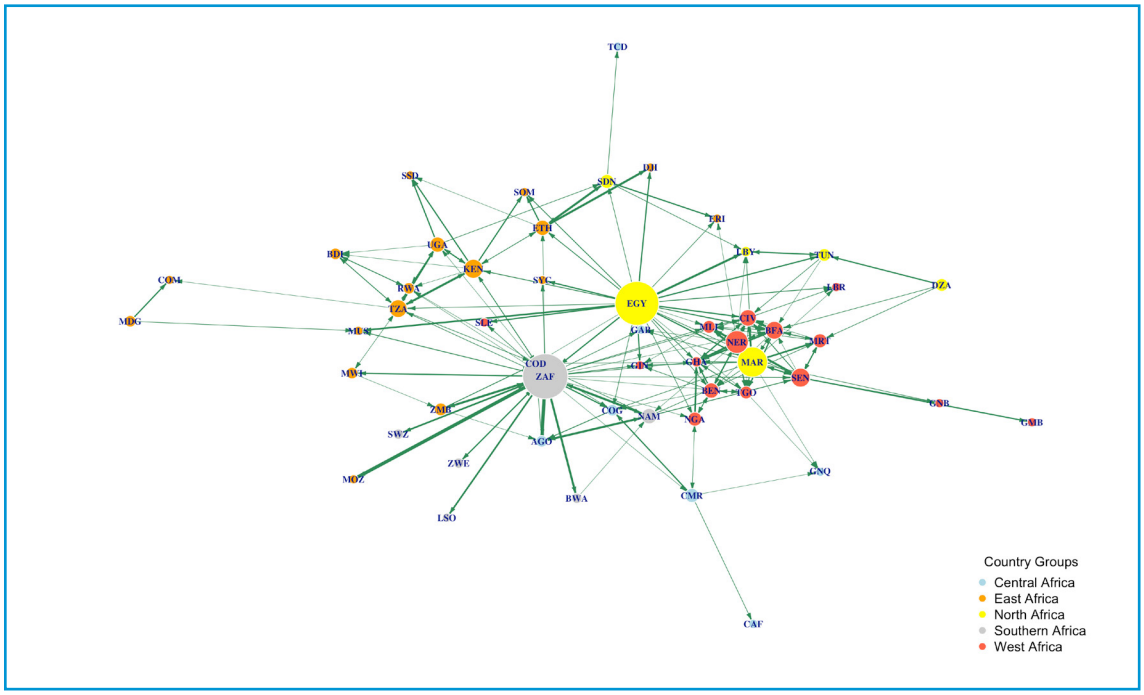
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.7 Intra-African onions and shallots exports network, 2003–2007



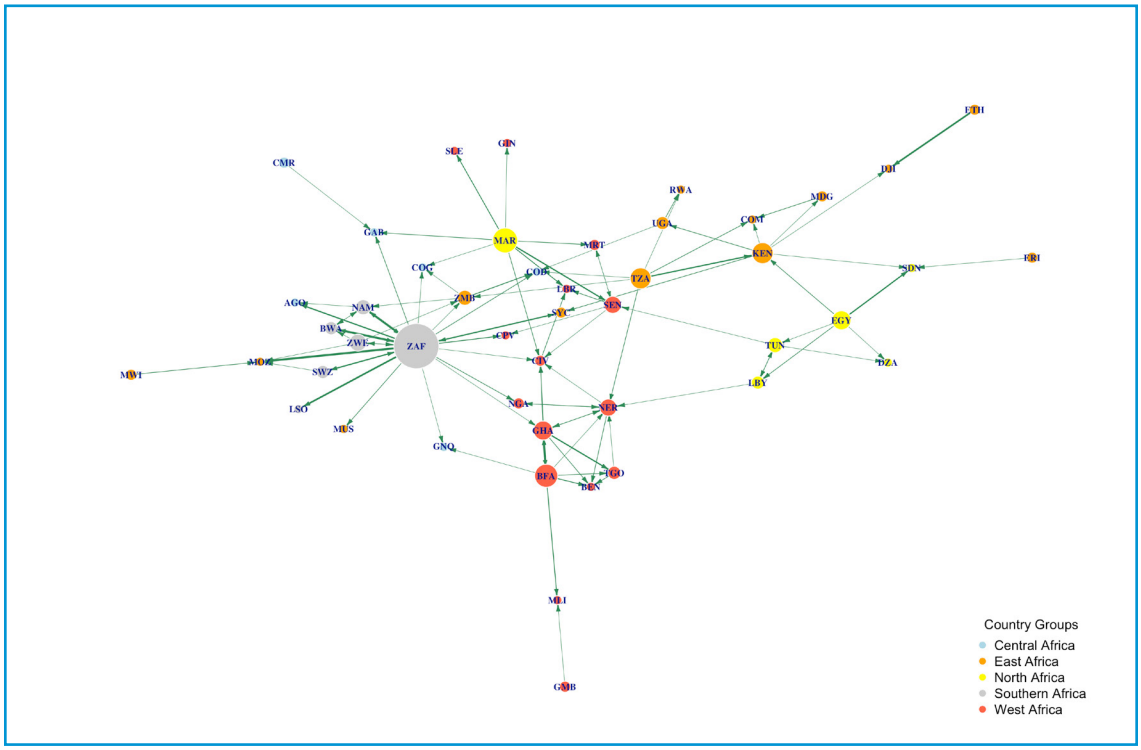
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.8 Intra-African onions and shallots exports network, 2015–2019



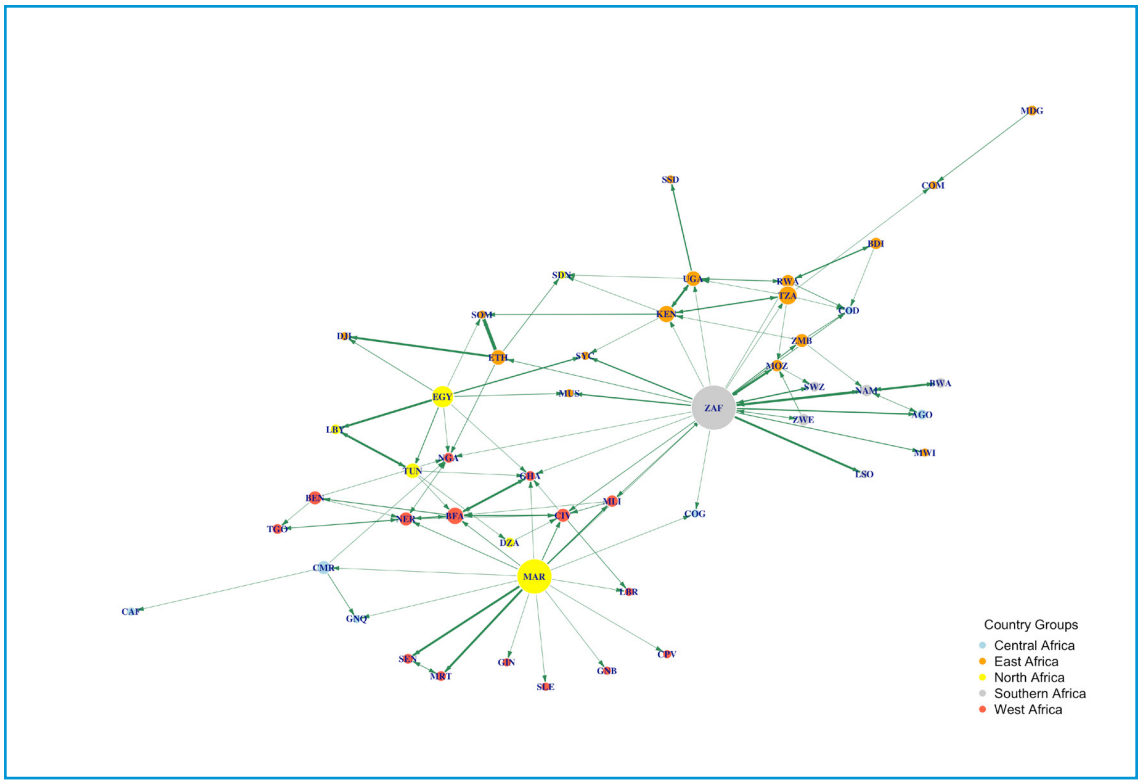
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.9 Intra-African tomato exports network, 2003–2007



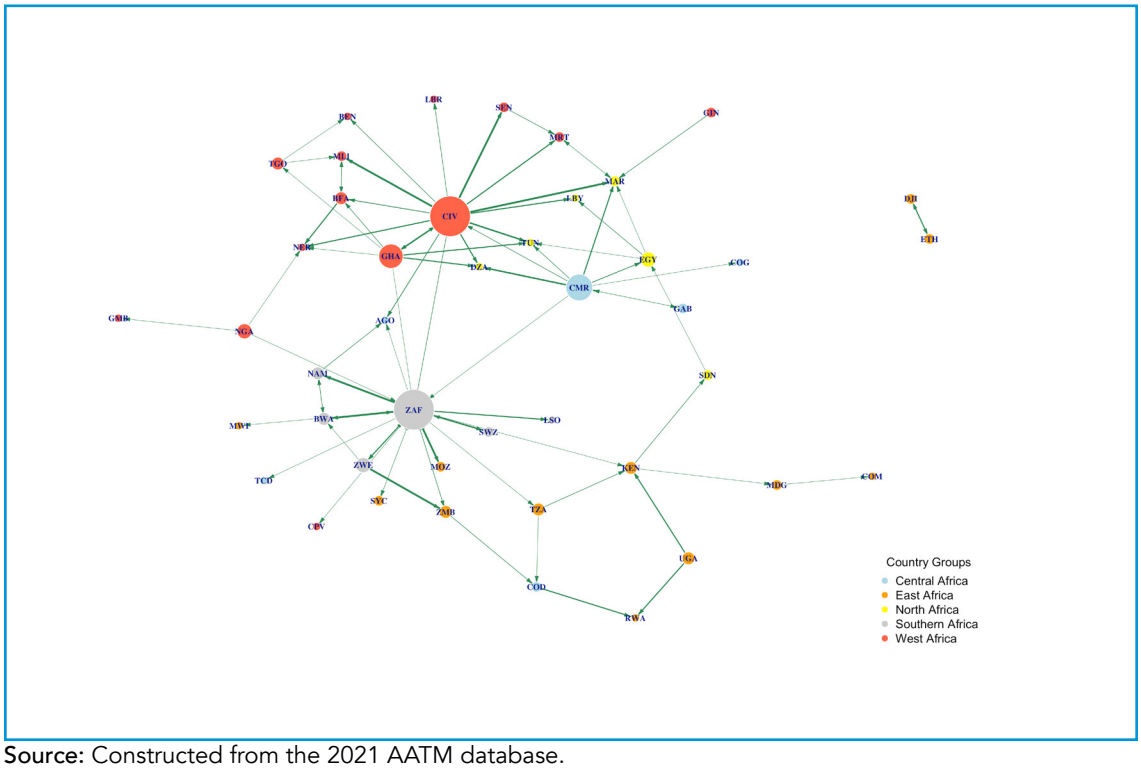
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.10 Intra-African tomato exports network, 2015–2019



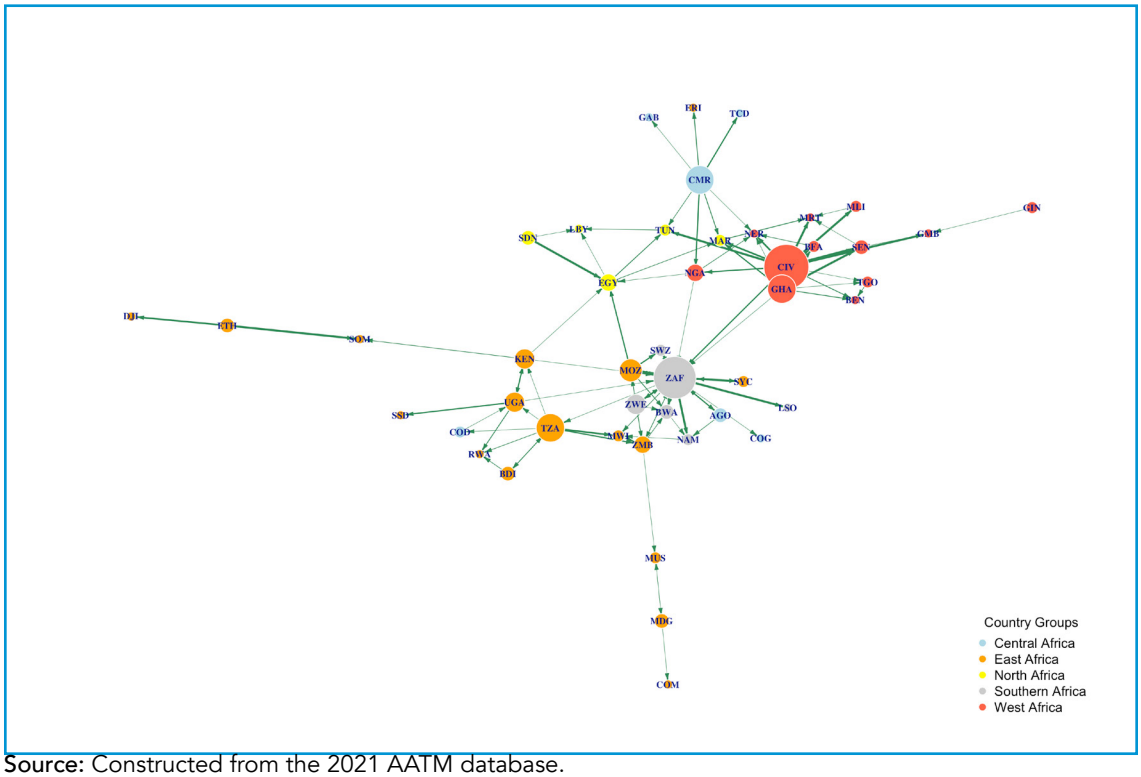
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.11 Intra-African banana and plantain exports network, 2003–2007



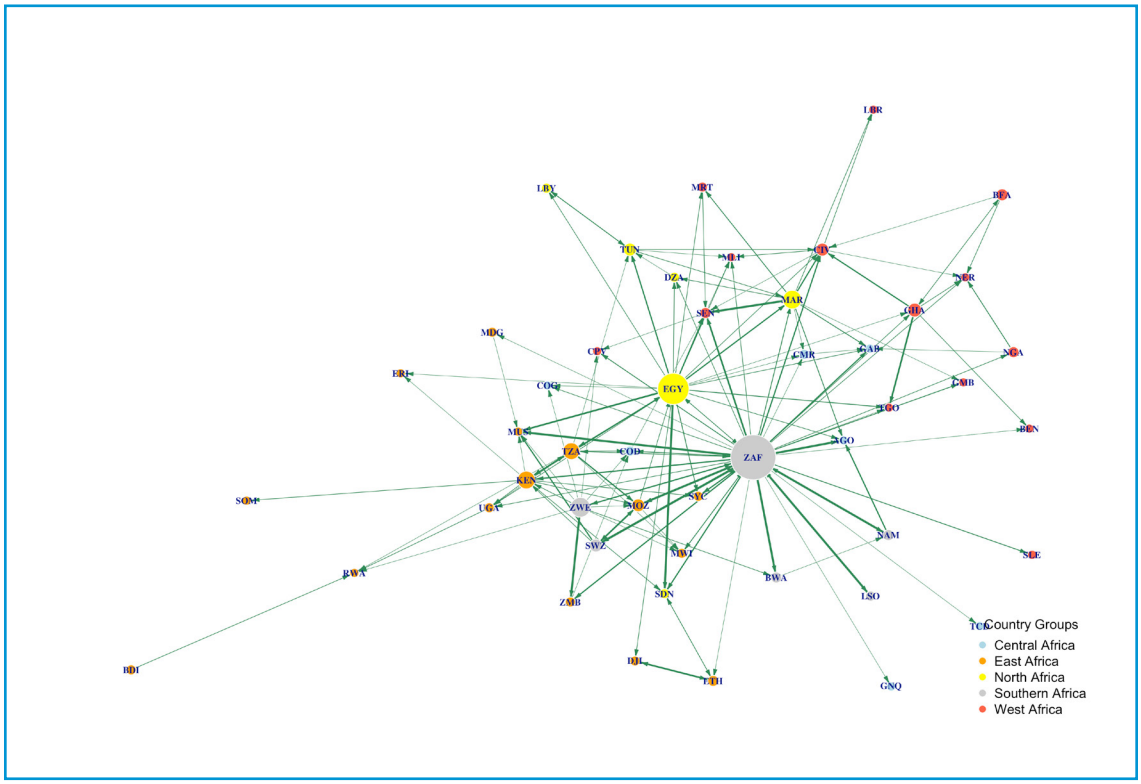
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.12 Intra-African banana and plantain exports network, 2015–2019



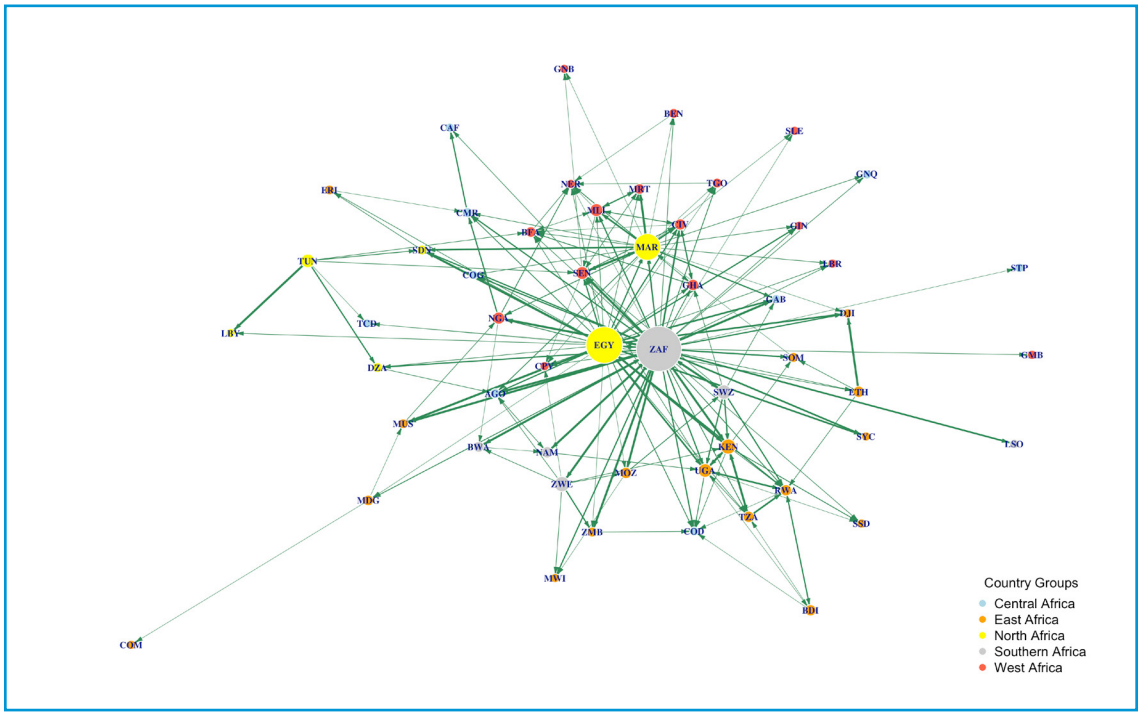
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.13 Intra-African citrus exports network, 2003–2007



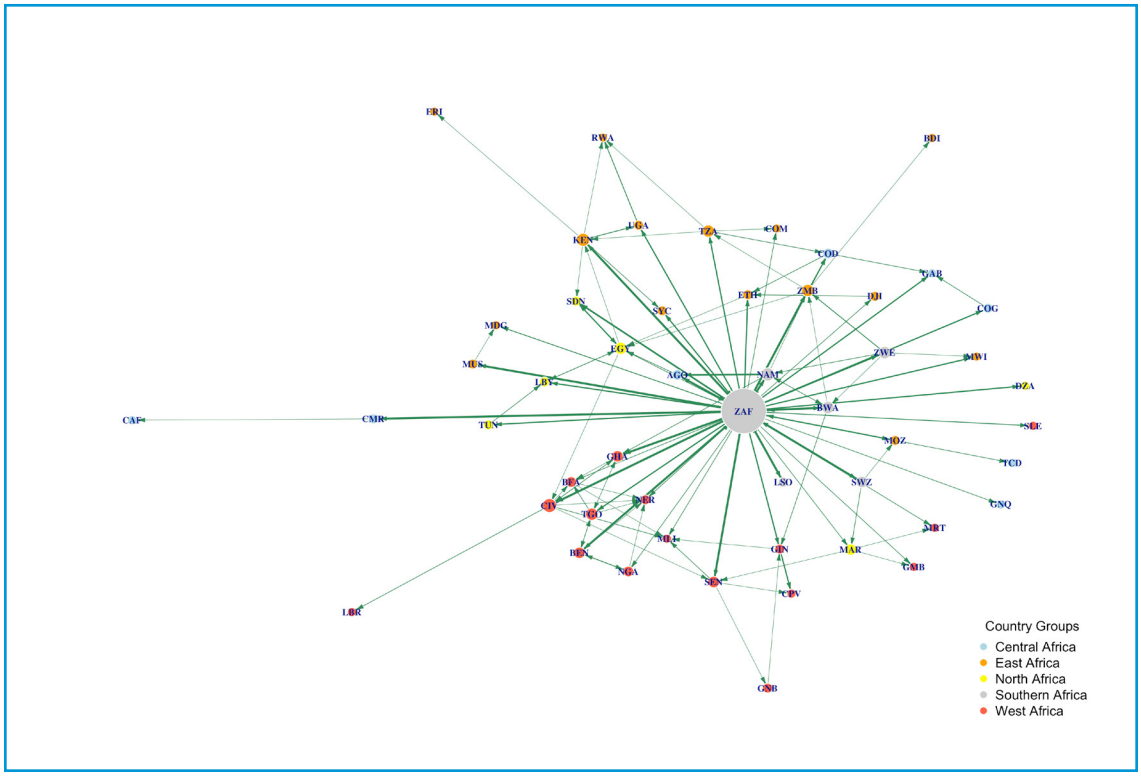
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.14 Intra-African citrus fruit exports network, 2015–2019



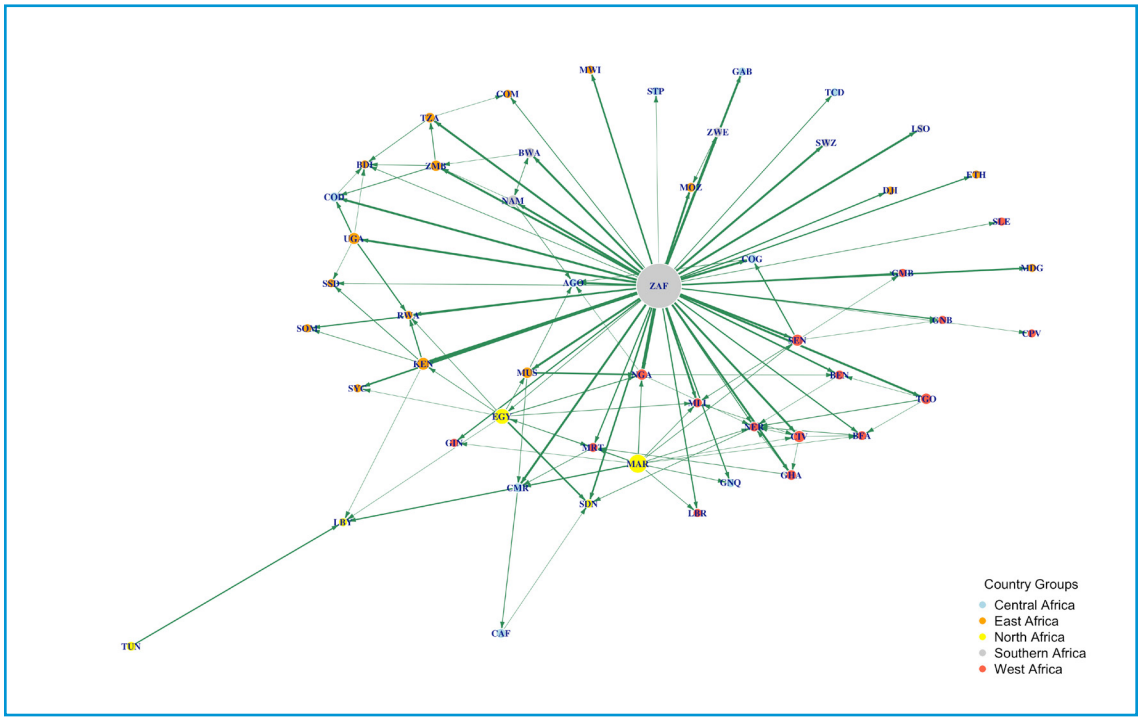
Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.15 Intra-African apple exports network, 2003–2007



Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

Figure A3.16 Intra-African apple exports network, 2015–2019



Source: Constructed from the 2021 AATM database.
Note: For country codes, see Table A3.1.

AFRICAN TRADE IN LIVESTOCK PRODUCTS AND VALUE CHAINS

Julie Kurtz, Lulit Mitik, and Chahir Zaki

Photo by Victor Ruehle/Pexels

Chapter 4

INTRODUCTION

Since the launch of the Africa Agriculture Trade Monitor (AATM), its fourth chapter has been dedicated to the study of different African agricultural value chains. In 2019, the AATM report examined the competitiveness of export-oriented commodity value chains, including traditional cash crops such as cashew nuts, cocoa, coffee, cotton, sugar, and tea, and more recent top exports like citrus, grapes, sesame seeds, tomatoes, legumes, and pulses. In 2020, the report considered the defensive trade interests of African cereals, sugar, and vegetable oil value chains. This year we examine livestock trade, one of the most complex trade sectors in African agriculture. Understanding this sector is complicated by the fact that formal livestock trade data tell only part of story, given that informal cross-border trade is widespread within Africa — especially informal trade of live animals. Many consumers in Africa continue to slaughter their own animals, whether purchased at markets or raised by their own households. In this chapter, we rely primarily on official trade statistics, but also qualify their validity and compare them with the (albeit limited) informal trade data available.

Though several African countries have extensive grazing land and strong pastoral traditions, only a handful have established strong export markets to the rest of the world. Many countries lack the capacity to meet global sanitary and phytosanitary (SPS) standards, especially those imposed by wealthy importing countries. Despite generous low-tariff or tariff-free quotas from several global importers, even Africa's strongest livestock exporters fall short of meeting the export quotas and import demand (Cabrera et al. 2010), while limited capacity to comply with the health standards of destination countries and other burdensome nontariff trade measures (NTMs) prevent many African traders from participating in global markets.

In previous years, the AATM has examined the competitiveness of African value chains at three stages: raw unprocessed goods, semiprocessed goods, and processed goods. Due to the complexity of animal product value chains, the breakdown of products in this year's report is slightly different, though the intent remains the same. We consider three main groups of livestock products — animals and meat, dairy, and poultry — breaking these down further as follows: [1]

Category I: Animals and Meat

- Live animals, including
  - Horses, mules and hinnies, asses
  - Cattle
  - Oxen
  - Swine
  - Goats
  - Sheep
  - Camels and camelids
- Carcasses and cuts
  - Cattle
  - Other animals
- Offal, salted or prepared meats
- Hides and skins

Category II: Poultry

- Live fowl
- Whole fowl (slaughtered)
- Fowl cuts, offal and preparations

Category III: Dairy

- Fluid milk
- Processed dairy
  - Dry milk and cream
  - Concentrated, whey, fats, constituents
  - Cheese
  - Cultured

Within these categories, the live animals (including live fowl) and fluid milk subcategories loosely resemble the unprocessed classification used for raw products in other value chains. Slaughtered poultry and other meat carcasses and cuts best fit the semiprocessed classification. Offal, fowl cuts (which are grouped with fowl offal at the HS6 level), prepared meats, hides and skins, and various forms of processed dairy can be considered processed products.

1 Appendix Table A4.1 presents the HS codes for each value chain of meat, dairy, and poultry products.

Previous research has estimated that African urban consumers' demand for meat and milk may triple by 2050 (Latino, Pica-Ciamarra, and Wisser 2020). Booming African urban demand, plus increased global demand for livestock products, have the potential to transform Africa's livestock value chains and international livestock trade. Yet low existing production, failure to achieve global SPS standards, and limited infrastructure investments and coordination may prevent African producers from benefiting from demand growth. They also face sharp competition globally from nations that invest heavily in livestock infrastructure and research and subsidize domestic meat, dairy, and poultry producers. These cumulative factors mean African exports will face difficulty becoming competitive at the world level.

Within Africa, most livestock trade is intraregional, primarily between neighboring countries and within regional economic communities (RECs). Yet, more broadly across the continent, intra-African trade is stifled by several countries that impose sizable tariff and nontariff trade barriers, especially for live animal trade. Ad valorem equivalents (AVEs) of nontariff restrictions (which measure their impact on trade by estimating an economically equivalent tariff rate) are high across Africa. AVEs for SPS measures and technical barriers to trade (TBT) range from 37 percent (for SPS) in Cabo Verde for edible meat to 146 percent (for TBT) in Gambia for meat preparations. While countries purportedly use NTMs to protect consumers and the environment, and also to support domestic industries, these measures further push producers to informal trade and may inadvertently reduce investments in livestock production and infrastructure.

At the time of publication, negotiations for the African Continental Free Trade Area (AfCFTA) were ongoing, with high stakes over rules of origin and highly sensitive products. Easing intra-African barriers to livestock trade may help to formalize Africa's large informal livestock trade sector, but it is unclear whether the AfCFTA will expand the total livestock trade flows (combined informal and formal trade). Given current limited infrastructure and coordination capacity, and the related challenges of transporting live animals or chilled or frozen meat or dairy, intra-African livestock trade will likely remain regional. Amid the threats of a rapidly changing climate (and the climate impact of livestock production) as well as numerous capacity challenges, it is still uncertain whether African production can meet the continent's growing domestic demand for meat, poultry, and dairy.

Against this backdrop, this chapter has several objectives. First, we examine the main trade flows (by product and by destination and origin markets) for the three product groups of interest, with some focus on informal trade. Next, we investigate the protectionist effect of trade policies, tariffs, and NTMs. Then, we consider the opportunities and risks in livestock production systems, especially risks from climate change and conflict, which are the primary threats to food security in Africa (IFPRI 2019). In the final section, we conclude and offer some policy recommendations.

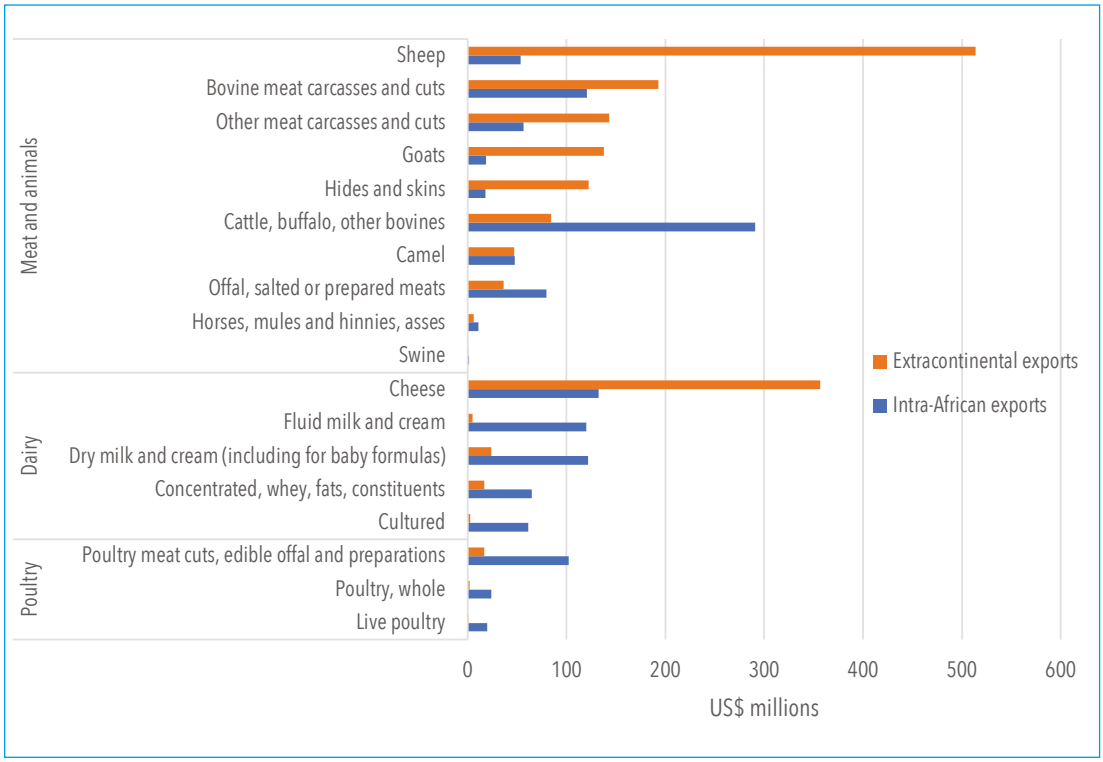
GENERAL OVERVIEW OF TRADE FLOWS

In the past decade, African countries have imported over US$10 billion annually in livestock products and exported close to $3.2 billion, according to official (formal) livestock trade statistics.[2] Of those livestock exports, approximately $1.8 billion are exported beyond the African continent, while African countries formally trade over $1.3 billion in livestock products within the continent. Figure 4.1 indicates that sheep and cheese are Africa's primary extracontinental exports, followed by bovine and other meat carcasses and cuts, goats, and hides and skins. Within Africa, cattle, buffalo, and other bovine live animals are the most commonly traded (formally), followed by cheese, bovine carcasses and cuts, dry milk and cream (including baby formula), fluid milk and cream, and poultry cuts, offal, and preparations. However, given the predominant role of informal intra-African livestock trade — especially live animal trade —

2 Throughout this chapter, "$" refers to US dollars.

formal intra-African export data must be interpreted cautiously. They likely grossly underestimate the degree to which livestock move across internal African borders. In this section, we examine trade over the past decade to present a broad overview and better compare formal and informal trade data; in the following sections, we focus on the recent 5-year trends.

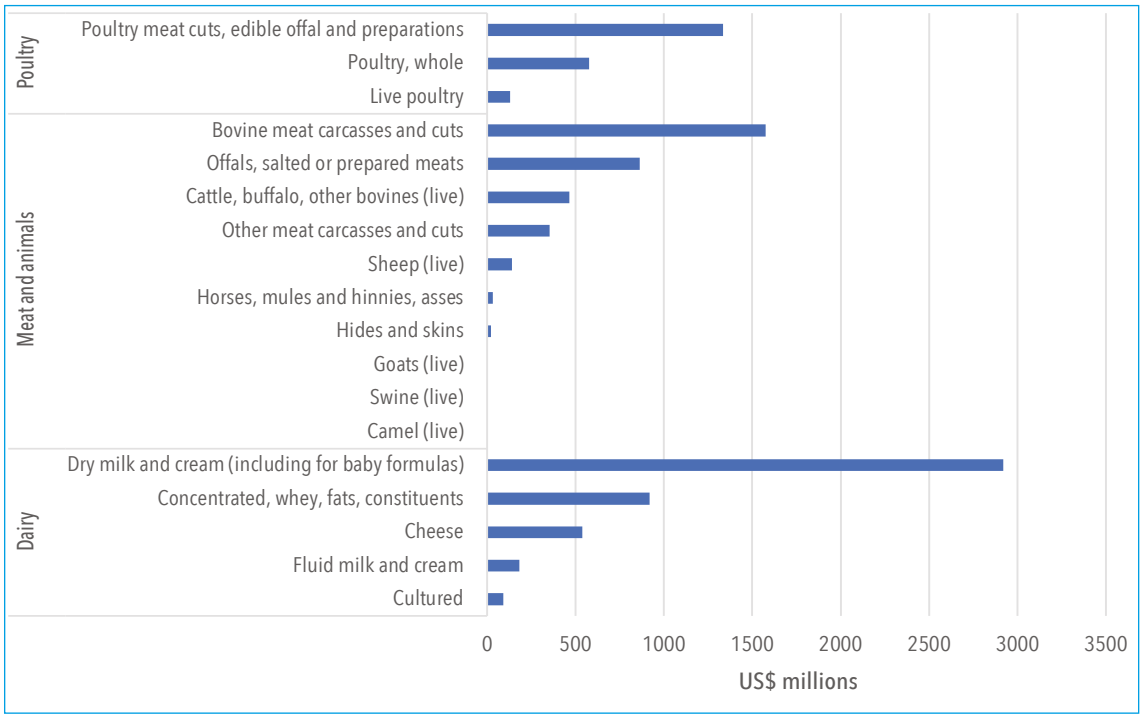
Figure 4.1 African formal exports, intra-African and extracontinental, annual average 2010–2019



Source: 2021 AATM database.

Figure 4.1 captures Africa's intracontinental and extracontinental exports. Logically, intra-African imports are equivalent to intra-African exports (bearing in mind that exports are often expressed at FOB prices and imports at CIF prices). African imports from the rest of the world (ROW) (Figure 4.2) far exceed exports to ROW, making Africa a net importer of livestock products. As shown in Figure 4.2, dry milk and cream (including for baby formula) are Africa's top ROW imports, with a value of $2.9 billion annually, followed by $1.6 billion in meat (bovine meat carcasses and cuts) imports, and $1.3 billion in poultry cuts, offal, and preparations.

Figure 4.2 African imports from rest of the world, annual average 2010–2019



Source: 2021 AATM database.

The role of informal livestock trade

No discussion of intra-African trade is complete without attention to informal cross-border trade. Last year's AATM report found that informal trade flows of livestock products can be up to 47 times the trade formally reported to UN Comtrade (Bouët, Odjo, and Zaki 2020). Though the AATM database accounts for some unreported trade (see the methodology description in Chapter 1), informal trade remains largely unreported. The Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel (CILSS), which tracks informal trade in West Africa, noted an additional $82.7 million in livestock trade between Burkina Faso, Côte d'Ivoire, Ghana, Mali, Niger, Nigeria, and Senegal during 2016, compared with official Comtrade statistics (Bouët, Odjo, and Zaki 2020). Similarly, in East Africa, Little (2005) reported that unofficial exports of commodities like livestock to neighboring countries exceeded official exports by a factor of 30 or more. Given the prevalence of informal cross-border trade, official intra-African livestock trade statistics must be interpreted cautiously.

Since Africa has no continentwide system to assess the extent of informal trade, we rely on existing regional data collection systems or isolated studies (see Chapter 5 of the AATM 2020 for more detail). For example, the Food Security Nutrition Working Group (FSNWG) has an extensive data-tracking system on informal livestock trade. Figure 4.3 shows formal trade reported by 11 East African countries.[3] For comparison, Figures 4.4 and 4.5 examine informal flows among the same 11 countries (not all countries reported informal livestock trade) from 2010 to 2019, as reported by FSNWG.[4] Even this data must be interpreted cautiously; reliability of informal trade data can be compromised for various reasons: The number of trade enumerators at borders and their consistency (that is, their evaluation of the number of head of livestock, the number of days per month they work a full shift at a particular border) greatly impact the accuracy of the data. Inclement weather that disrupts travel to the border or even delayed payment for enumerators

3 These are Burundi, Djibouti, DRC, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania, and Uganda.

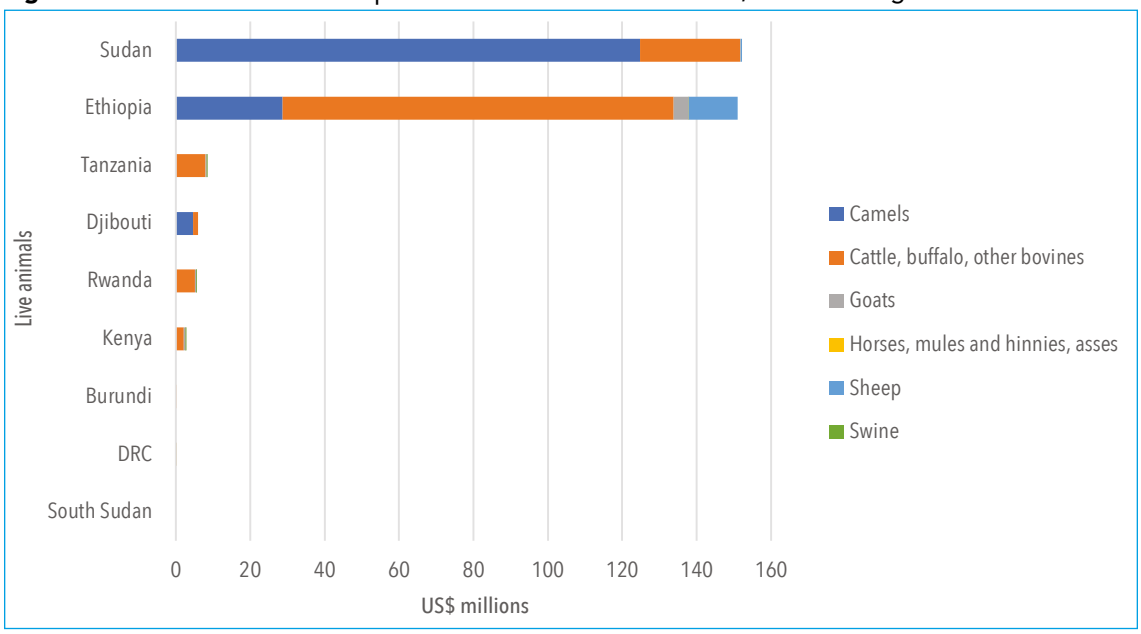
4 The authors thank Thomas Awuor of FSNWG for providing these data in January 2021

can reduce the accuracy of their work, as can the frequency with which goods are smuggled or go uncounted at border crossings, as well as numerous other factors that can introduce bias in the data.

According to formal data (Figure 4.3), Ethiopia and Sudan are the significant regional exporters of live animals on the formal market, each with over $150 million annual average value in exports, primarily in camels and cattle. Informal trade data show Ethiopia playing a smaller role in regional livestock trade, whereas Rwanda, Tanzania, and Somalia appear to dominate the informal export market (Figure 4.4), each exporting several hundred thousand live animals in the past decade. Rwanda has exported roughly 100,000 animals on average each year (over 930,000 total from 2010 to 2019), but reports less than $10 million in formal exports. In another stark contrast, informal trade data from FSNWG showed zero live animal exports from Sudan, which is highly unlikely given its strong formal live animal export market.

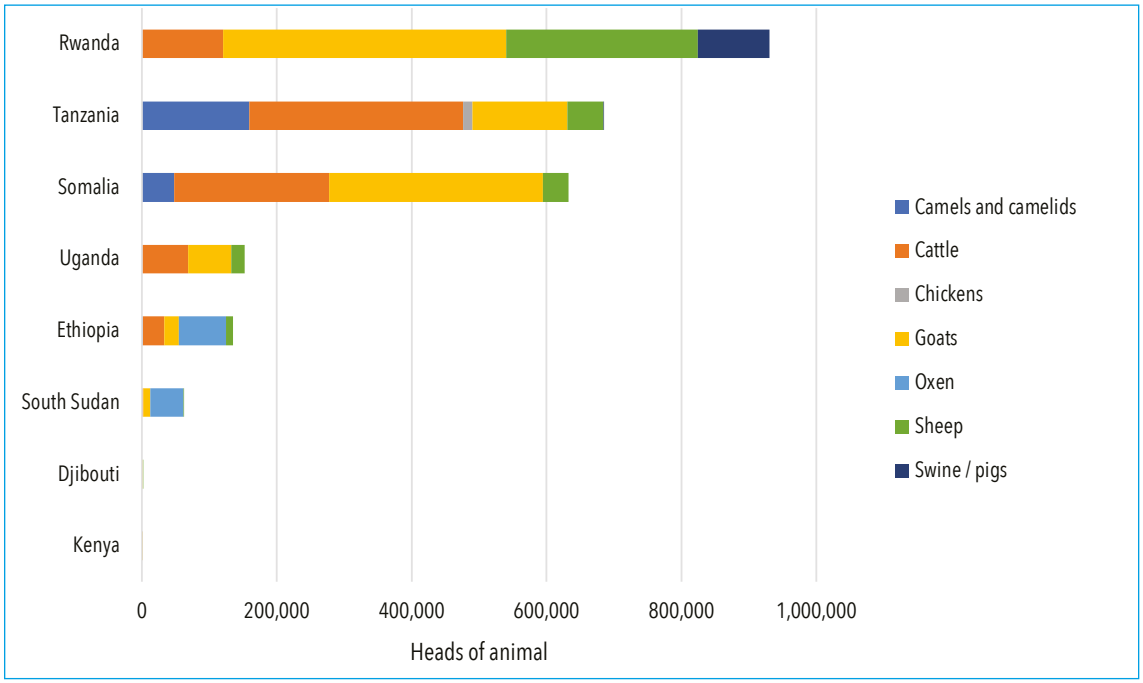
Nonetheless, existing informal trade data give us some perspective on the gaps present in formal statistics. Available data from FSNWG show that goats and cattle predominate in informal trade, followed by sheep and camels (Figures 4.4 and 4.5). Yet goats and sheep have only a nominal presence in formal intra-African trade statistics, even though — according to informal trade sources — they are robustly traded within the region. Sheep and goats are also Africa's primary live animal exports to the rest of the world, according to formal trade data (see Figure 4.1). While comparison of informal and formal data sources may raise more questions than answers, we highlight the differences here to emphasize that formal livestock trade data fail to tell the whole story. Limited data on actual trade flows, especially of live animals, mean that we can only make educated assumptions about the amount of livestock goods crossing African borders.

Figure 4.3 Formal intra-African exports of live animals in East Africa, annual average 2010–2019



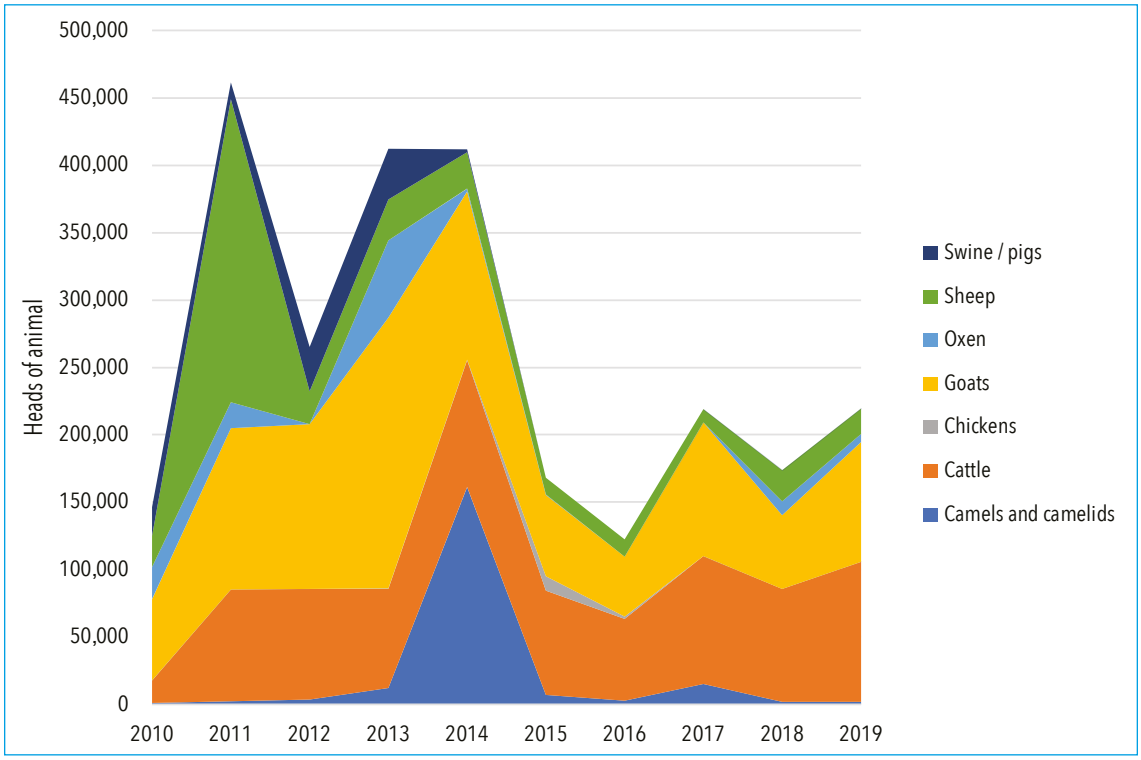
Source: 2021 AATM database.

Figure 4.4 Informal intra-African exports of live animals in East Africa by country, 2010–2019 totals



Source: Food Security Nutrition Working Group.
Note: Includes collected informal intra-African livestock trade between Burundi, Djibouti, DRC, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania, and Uganda.

Figure 4.5 Total informal exports of live animals in East Africa, 2010–2019

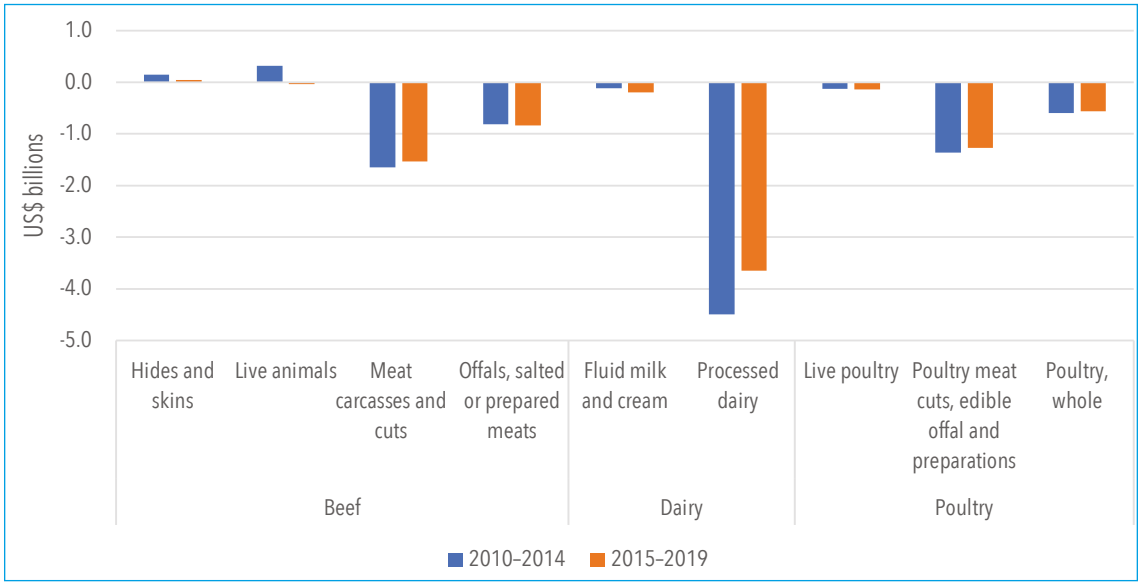


Source: Food Security Nutrition Working Group.
Note: Includes collected informal intra-African livestock trade between Burundi, Djibouti, DRC, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania, and Uganda.

NET AFRICAN TRADE FLOWS OF LIVESTOCK PRODUCTS

According to official statistics, Africa is a net importer of meat, dairy, and poultry (Figure 4.6), importing far more than it exports in all animal products except live animals and hides and skins. On average from 2015 to 2019, African countries imported $3.6 billion of processed dairy, $0.85 billion less than the 2010–2014 average. Similarly, net imports of meat carcasses and cuts were $1.5 billion on average between 2015 and 2019, a slight reduction from $1.6 billion annually between 2010 and 2014. In the 2010–2014 period, Africa was a net exporter of live animals, reaching $0.3 billion on average annually, and of hides and skins, with an average value of $0.2 billion annually. In the 2015–2019 period, the continent became a net importer of live animals, reaching $30 million annually. Decomposition of the data into intra-African trade and trade with the rest of the world reveals that nearly 40 percent of imports and exports are within Africa. Furthermore, as presented in the previous section, informal trade of live animals is substantial but unaccounted for by formal trade data.

Figure 4.6 Continent-level net exports by stage of processing of meat, dairy, and poultry value chains, averages 2010–2014 and 2015–2019



Source: 2021 AATM database.

Note: Negative values indicate net imports.

Table 4.1 shows the composition of African exports and imports. According to official statistics, live animal exports represented 61.8 percent of total value of exports on average from 2010 to 2014, and 60.5 percent for 2015 to 2019, followed by meat carcasses and cuts. In contrast, half of African meat imports are meat carcasses and cuts and one-fourth are offal and salted or prepared meat. For dairy products, processed products dominate trade, accounting for 82 percent of exports and 92.7 percent of dairy imports between 2015 and 2019. Of these, cheese accounts for nearly two-thirds of African exports; and dry milk and cream account for close to two-thirds of imports. African poultry exports and imports are composed of meat cuts, edible offal, and preparations, which together accounted for 67.4 percent of total exports and 64.9 percent of total imports between 2015 and 2019.

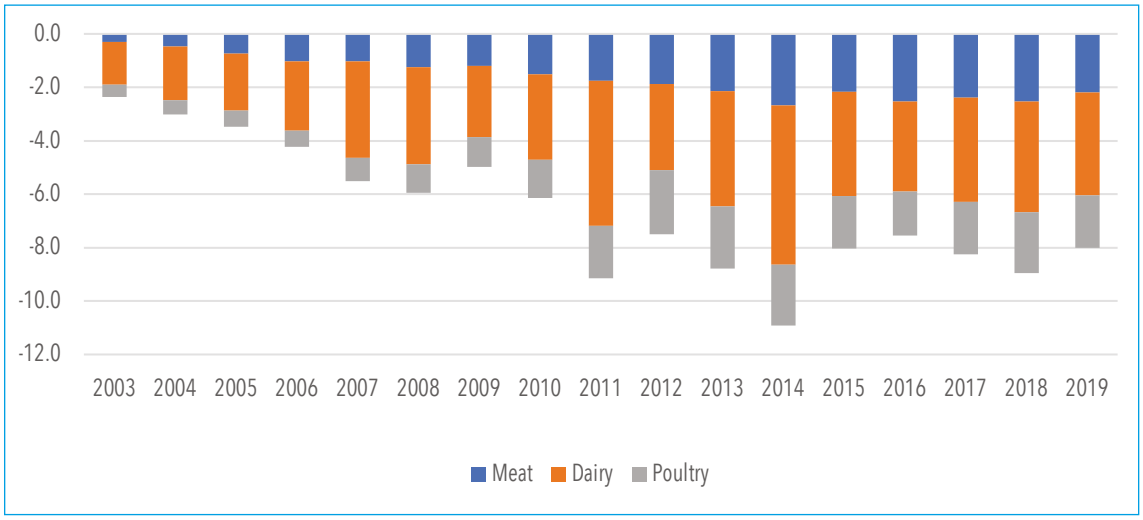
Table 4.1 Share of African livestock export and import values, 2010–2014 and 2015–2019 averages

	Subcategory	Exports		Imports	
		2010–2014	2015–2019	2010–2014	2015–2019
Meat and animals	Hides and skins	9.1	4.8	0.9	1.0
	Live animals	61.8	60.5	23.7	27.6
	Meat carcasses and cuts	23.2	28.9	52.4	49.0
	Offal, salted or prepared meats	5.9	5.8	23.0	22.4
Dairy	Fluid milk and cream		18.0	4.7	7.3
	Processed dairy		82.0	95.3	92.7
Poultry	Live poultry	12.6	12.2	6.4	7.3
	Poultry meat cuts, edible offal and preparations	76.2	67.4	66.3	64.9
	Poultry, whole	11.2	20.4	27.3	27.8

Source: 2021 AATM database.
Note: Values for dairy for 2010–2014 are omitted due to data inconsistencies.

The evolution of net exports of meat, dairy, and poultry between 2003 and 2019 is presented in Figure 4.7. Africa was already a net importer of these animal-source foods in 2003, and net imports increased more than threefold between 2003 and 2019. Net imports of animals and meat rose from $0.3 to $2.2 billion; dairy from $1.6 to $3.8 billion; and poultry from $0.5 billion to $2 billion.

Figure 4.7 Net African exports of livestock products, 2003–2019 (US$ billions)



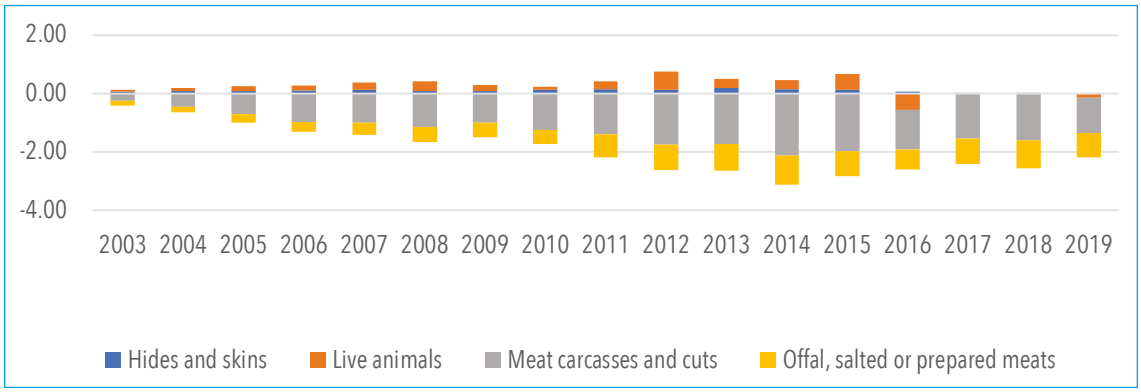
Source: 2021 AATM database.
Note: Negative values indicate net imports.

Three countries — Sudan, South Africa, and Egypt — are Africa's main net exporters of meat and animals, dairy, and poultry. The continent's three primary net importers are Libya, Lesotho, and Mozambique. At the product level, net exporters primarily export live animals and meat, while net imports are a combination of the three product groups.

Meat value chain

Within the meat value chain, a major share of imports consists of carcasses and cuts (Figure 4.8). Africa is a net exporter of live animals and hides and skins. The evolution of trade between 2003 and 2019 shows an increase in net exports of live animals and, conversely, an increase in net imports of slaughtered and processed meat until 2015. From 2016 to 2019, Africa was a net importer of meat and animals at all processing stages (Figure 4.8). Net exports of live animals increased from $60 million in 2003 to $540 million in 2015. Since 2016, a sharp drop in exports (from $1.6 billion in 2015 to $554 million in 2016) combined with increasing imports explains the change in status from net exporter to net importer of live animals. Africa was a net importer of meat carcasses and cuts and offal and prepared meats in 2003; these net imports increased nearly fivefold between 2003 and 2019 (from $418 million to $2 billion).

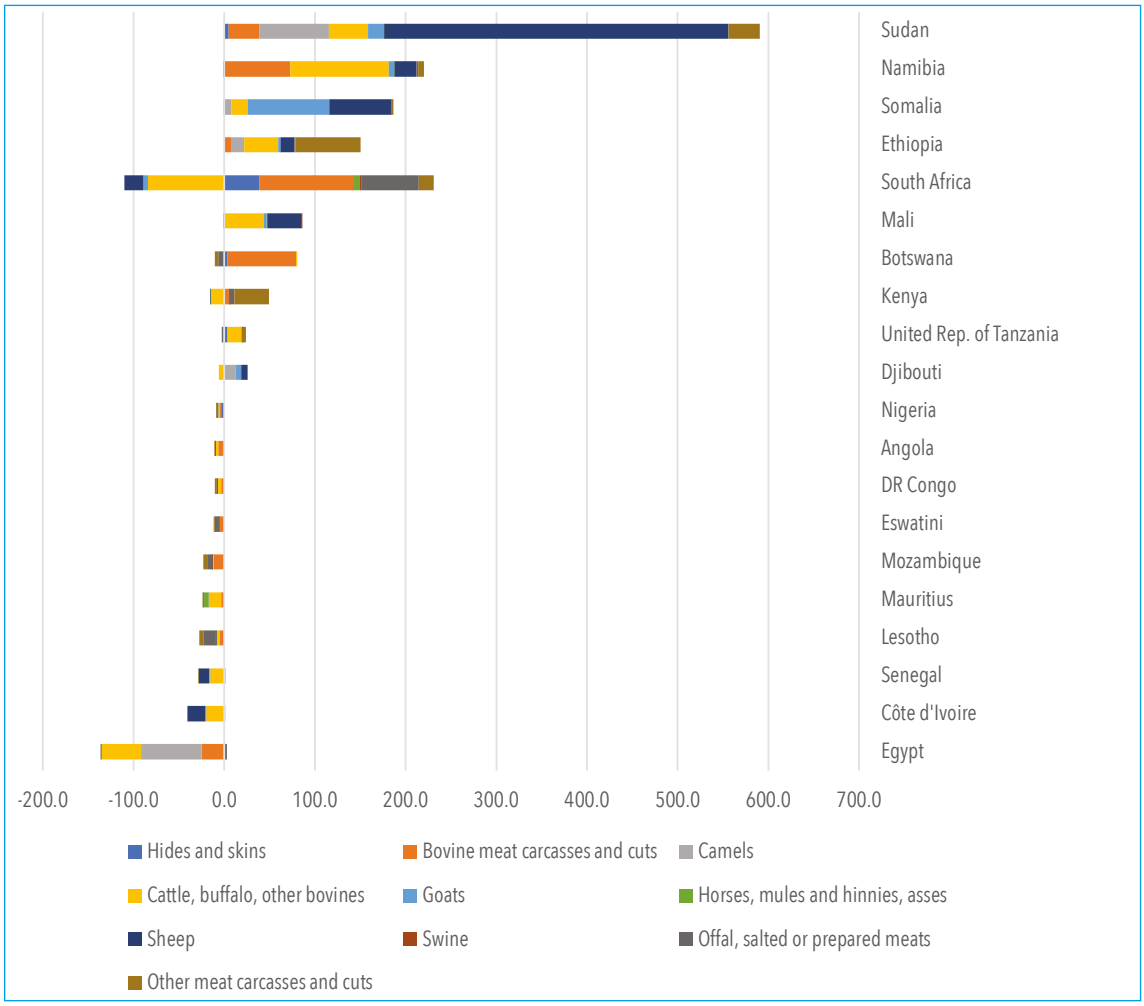
Figure 4.8 Net exports of Africa of meat and animals by processing stage, 2003–2019 (US$ billions)



Source: 2021 AATM database.
Note: Negative values indicate net imports.

Sudan is Africa's top net exporter of animals and meat, followed by Namibia, Somalia, Ethiopia, and South Africa. For these countries, net exports ranged on average from $590 million for Sudan to $121 million for South Africa from 2015 to 2019 (Figure 4.9). Net exports are mainly composed of live animals. Ethiopia, Kenya, and Sudan are the top three net exporters of meat carcasses and cuts, while South Africa is the top net exporter of offal, salted or prepared meats and meat carcasses and cuts. The three largest net importers of live animals are Egypt, Côte d'Ivoire, and Senegal; net imports ranged from $135 million for Egypt to $28 million for Senegal, on average, between 2015 and 2019. The top five net importers of meat are Egypt, Côte d'Ivoire, Senegal, Lesotho, and Mauritius. Africa is a net importer of processed meat carcasses and cuts, and offal, salted or prepared meats. Among African countries, Egypt is the top net importer of slaughtered animals and processed meat ($23.3 million) from 2015 to 2019, closely followed by Lesotho ($22.8 million) and Mozambique ($21.2 million).

Figure 4.9 Meat and animal net exports by stage of processing, country averages 2015–2019 (US$ millions)

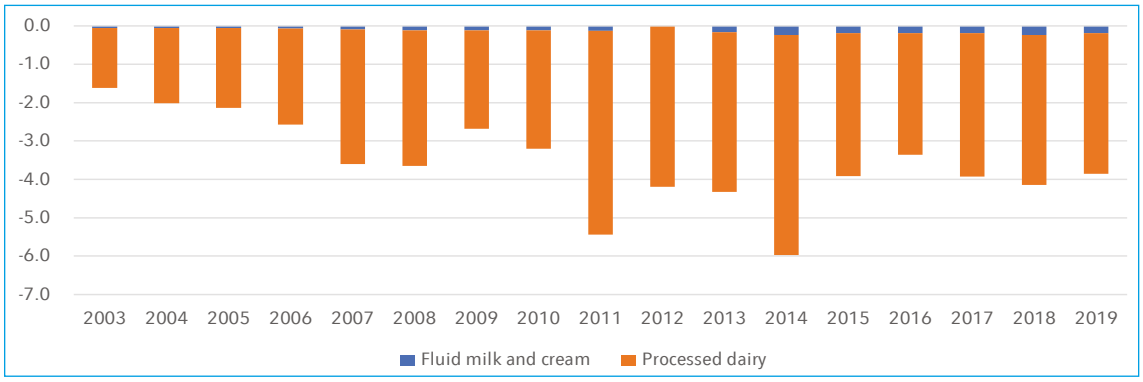


Source: 2021 AATM database.
Note: Countries are classified from the largest to smallest net exports of semiprocessed meat. Negative values indicate net imports.

Dairy value chain

Africa's dairy trade mainly comprises processed products. Figure 4.10 presents the evolution and composition of net dairy exports. Africa's net imports of processed dairy were $1.6 billion in 2003, peaking in 2014, and stood at $3.7 billion in 2019.

Figure 4.10 Net African dairy exports, 2003–2019 (US$ billions)

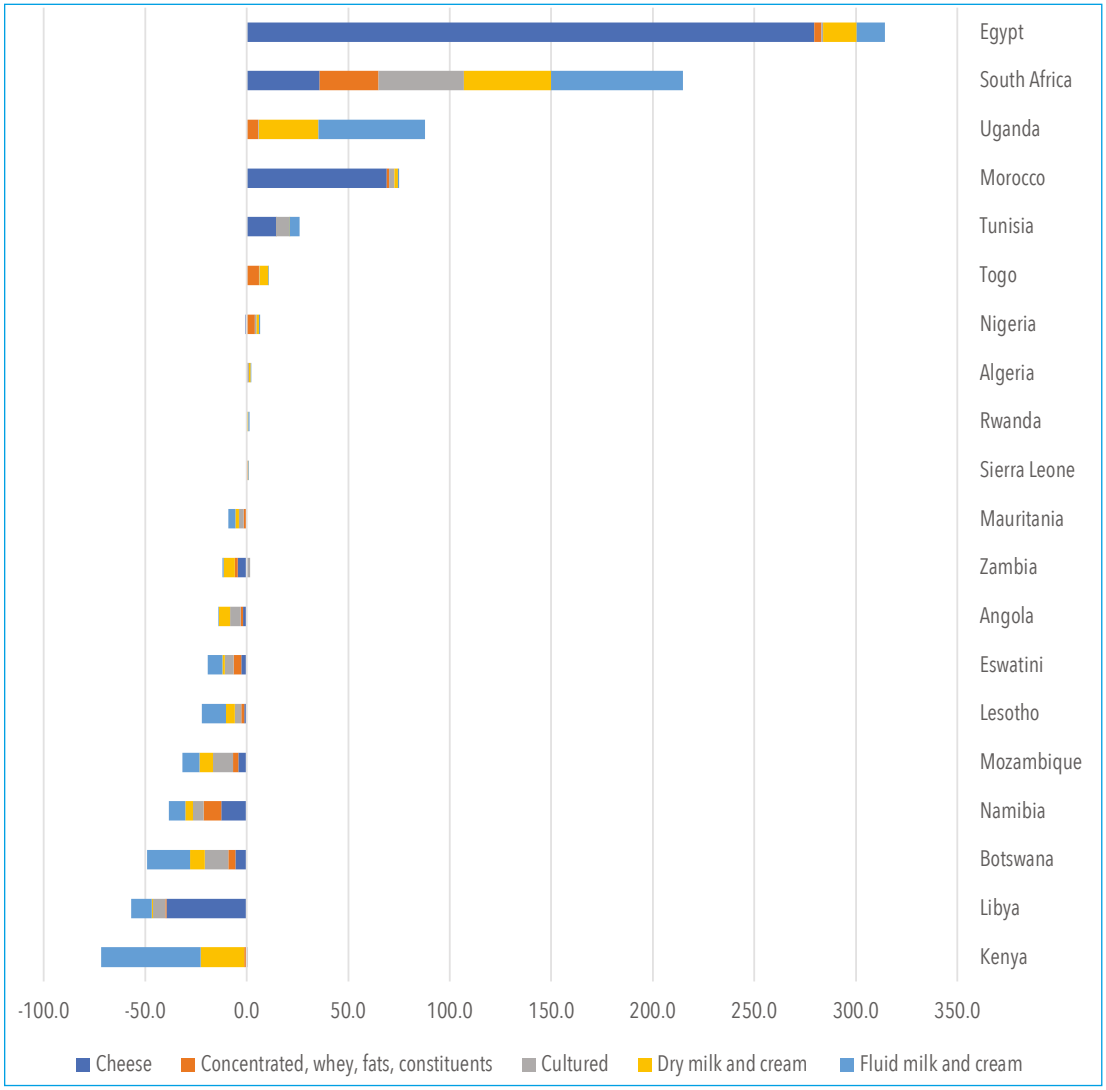


Source: 2021 AATM database.

Africa's net exports of processed and unprocessed dairy products are presented in Figure 4.11. Country-level data show that the top five net exporters are Egypt, South Africa, Uganda, Morocco, Tunisia, and Togo, with average annual net exports ranging from $71 million for Egypt to $31 million for Morocco in 2015–2019. The decomposition by processing stage reveals that South Africa, Uganda, and Egypt are net exporters of fluid milk and cream, with net exports reaching $65 million, $52 million, and $14 million, respectively, in 2015–2019. Only 11 African countries are net exporters of processed dairy; Egypt, South Africa, and Morocco are the top three.

Most countries are net importers of dairy products; the five largest are Kenya, Libya, Botswana, Namibia, and Mozambique. Among the net importers of fluid milk and cream, the top three are Kenya, Botswana, and Lesotho, with average annual imports of $49 million, $21 million, and $12 million between 2015 and 2019, respectively. The top three net importers of processed dairy are Libya, Namibia, and Botswana, with average annual imports of $47 million, $30 million, and $28 million between 2015 and 2019, respectively.

Figure 4.11 Net dairy exports by African country and stage of processing, average 2015–2019 (US$ millions)

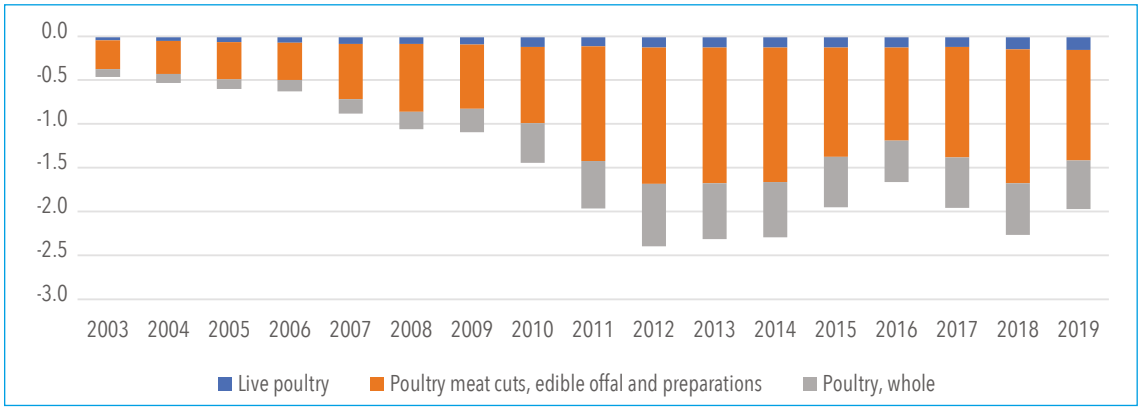


Source: 2021 AATM database.
Note: Countries are classified from the largest to the smallest net exporters in processed dairy. Negative values indicate net imports.

Poultry value chain

The poultry value chain includes live chickens, ducks, geese, turkeys, and guinea fowl. Processed preparations include poultry meat cuts, edible offal and preparations, and whole poultry. Africa is a net importer of poultry. From 2003 to 2019, African countries increased poultry imports significantly; in 2003, Africa imported $46 million in live poultry, $324 million in cuts, edible offal and preparations, and $92 million in whole poultry, which increased to $157 million, $1.26 billion, and $558 million, respectively, by 2019 (Figure 4.12).

Figure 4.12 Net African poultry exports by processing stage, 2003–2019 (US$ billions)

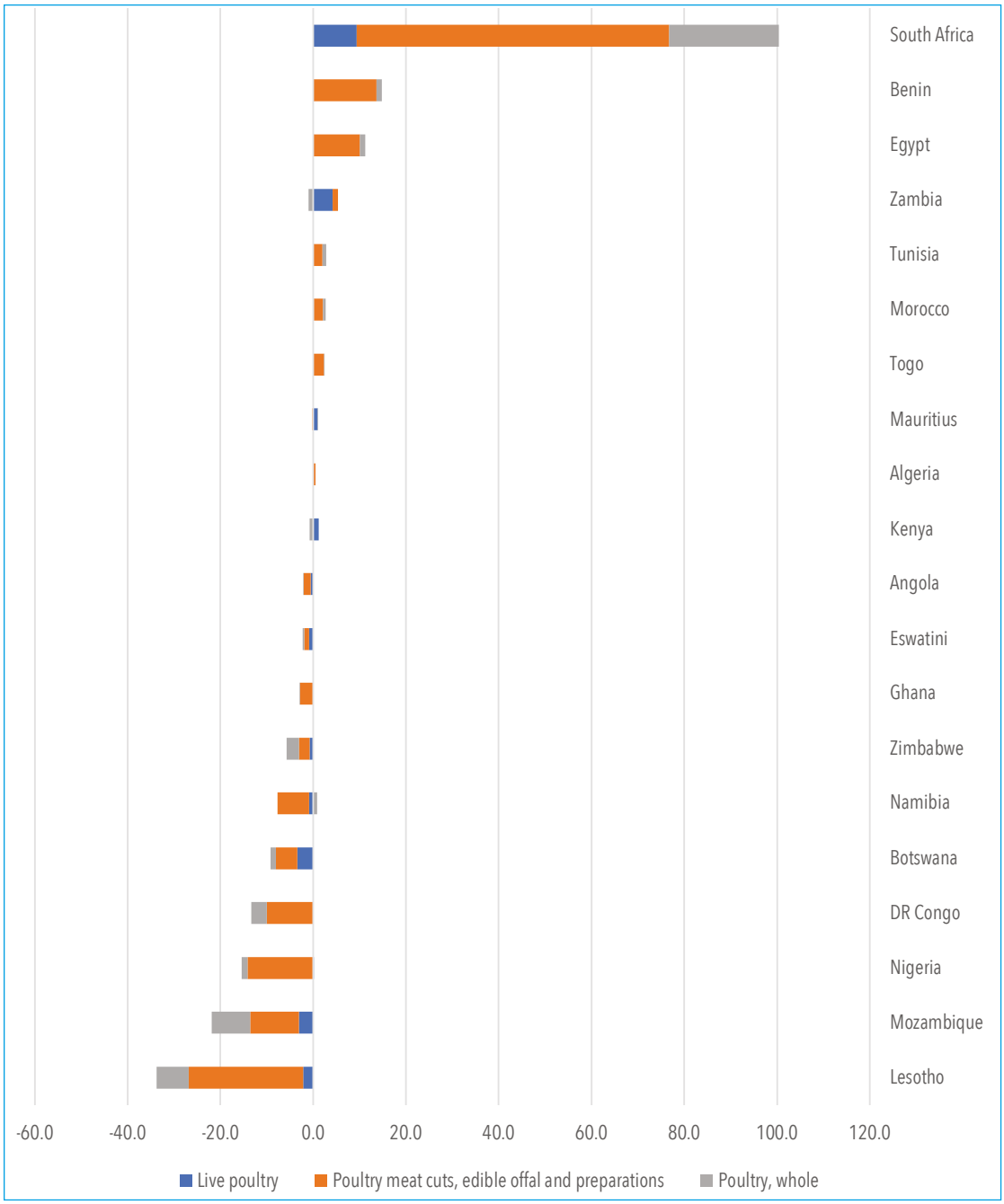


Source: 2021 AATM database.
Note: Negative values indicate net imports.

Country-level data show that net exports and imports of live birds are small, remaining below $1 million for most countries (Figure 4.13). Only South Africa, Zambia, and Kenya were net exporters of live birds, with values over $1 million. South Africa is also a net exporter of processed poultry, with $91 million in average net exports from 2015 to 2019. Benin is the second net exporter of poultry meat cuts, edible offal and preparations, with net exports reaching an average of $14 million from 2015 to 2019. Although Egypt is a net importer of live birds, it is a net exporter of processed poultry, with net exports reaching $11 million on average for 2015–2019.

Most African countries are net importers of poultry products. The countries with over $1 million in net imports of live poultry are Botswana, Mozambique, Lesotho, and Uganda. As for processed poultry, the top three net importers from 2015 to 2019 were Lesotho, Mozambique, and Nigeria, with imports averaging $32 million, $19 million, and $15 million, respectively.

Figure 4.13 Net poultry exports by processing stage, average 2015–2019 (US$ millions)



Source: 2021 AATM database.
Note: Countries are classified from the largest to smallest net exports in live birds. Negative values indicate net imports.

The figures above show that Africa is increasingly a net importer of poultry and processed meat. In contrast, its exports of live animals have been increasing over time. Table 4.2 shows the live animal exports for Africa and globally. Although African countries are among the world's top exporters of camels, cattle, buffalo, other bovines, and sheep, they are not well positioned in the global ranking of exporters of cuts, carcasses, and prepared meats (Table 4.3). To increase their exports of processed meat, rather than simply exporting live animals, African countries need to improve their production capabilities. African countries do have a productive advantage in camels, as they are produced in few regions of the world.

Table 4.2 Average share and ranking of top 10 exporters of live animals, 2015–2019

	Camels		Cattle, buffalo, other bovines		Goats		Horses, mules and hinnies, asses		Sheep		Swine	
World	Sudan	28.0	France	16.3	Somalia	29.7	UK	15.6	Sudan	24.3	Netherlands	24.2
	Oman	17.6	Australia	12.9	Romania	11.4	Ireland	14.8	Romania	13.0	Denmark	23.4
	Ethiopia	13.7	Mexico	11.1	Oman	9.6	USA	12.3	Australia	11.7	China	10.9
	Saudi Arabia	12.0	Canada	10.4	India	9.4	Netherlands	11.2	Spain	10.7	Canada	8.7
	UAE	6.9	Brazil	4.8	Sudan	7.1	Germany	7.9	Jordan	6.6	Germany	6.4
	Djibouti	5.9	Germany	4.1	Iran	7.0	France	6.0	Somalia	4.8	Spain	5.0
	Somalia	4.9	Spain	3.4	Australia	5.0	Australia	5.3	Mali	4.1	Belgium	4.7
	Kuwait	2.7	Uruguay	2.8	Djibouti	3.7	China	4.4	Iran	3.3	Ireland	2.4
	Other small countries	2.3	Netherlands	2.6	Namibia	2.1	Belgium	4.2	Hungary	3.0	France	2.3
	Qatar	2.0	Czech Rep.	2.3	Mali	1.9	New Zealand	3.9	Portugal	2.1	Hungary	1.9
Africa	Sudan	53.2	Namibia	29.8	Somalia	63.3	South Africa	51.8	Sudan	65.6	South Africa	75.3
	Ethiopia	26.0	Mali	19.4	Sudan	15.1	Ghana	14.8	Somalia	12.8	Niger	7.5
	Djibouti	11.2	Ethiopia	12.5	Djibouti	8.0	Mauritius	9.5	Mali	11.0	Malawi	5.9
	Somalia	9.2	Sudan	11.6	Namibia	4.6	Niger	4.3	Namibia	4.1	Kenya	3.9
	Mali	0.3	Somalia	10.7	Mali	4.0	Tunisia	4.1	Ethiopia	3.3	Zambia	2.0
	Niger	0.05	South Africa	7.2	Ethiopia	2.4	Mali	3.4	Djibouti	2.2	Mali	1.6
	Egypt	0.02	Tanzania	4.2	South Africa	1.1	Somalia	2.0	South Africa	0.6	Uganda	1.2
	Libya	0.02	Rwanda	1.1	Tanzania	0.5	Morocco	1.7	Burkina Faso	0.1	Botswana	0.6
	South Africa	0.01	Botswana	0.7	Kenya	0.4	Namibia	1.4	Niger	0.1	Nigeria	0.5
	Kenya	0.01	Burkina Faso	0.5	Niger	0.4	Djibouti	1.4	Eritrea	0.0	Rwanda	0.4

Source: 2021 AATM database.

Table 4.3 Average share and ranking of top 10 exporters of meat products, carcasses and cuts, hides and skins, 2015–2019

	Meat products		Carcasses and cuts				Hides and skins	
	Offal, salted or prepared meats		**Other meat carcasses and cuts**		**Bovine meat carcasses and cuts**			
World	USA	15.6	USA	12.3	Australia	14.6	USA	30.8
	Germany	10.5	Germany	12.2	USA	12.7	Australia	7.1
	Brazil	6.9	Spain	11.0	Brazil	11.6	France	6.9
	Italy	6.8	Denmark	7.5	India	7.7	Germany	5.9
	Spain	6.2	Canada	7.4	Netherlands	5.4	Netherlands	5.6
	Netherlands	5.7	Australia	7.3	New Zealand	4.8	Canada	4.9
	China, Hong Kong	4.0	New Zealand	6.6	Ireland	4.7	Italy	3.2
	Denmark	3.8	Netherlands	6.3	Canada	3.8	Spain	3.1
	Ireland	3.7	Belgium	4.3	Argentina	3.6	United Kingdom	3.0
	Poland	3.4	Brazil	3.9	Uruguay	3.5	Ireland	2.8
Africa	South Africa	67.5	Ethiopia	36.0	South Africa	38.6	South Africa	47.3
	Namibia	13.8	Kenya	19.0	Botswana	21.8	Tunisia	9.2
	Kenya	5.4	Sudan	17.5	Namibia	21.5	Sudan	5.7
	Egypt	2.1	South Africa	14.3	Sudan	9.7	Rwanda	4.5
	Togo	1.8	Namibia	6.6	Ethiopia	2.1	Tanzania	4.3
	Uganda	1.8	Tanzania	2.6	Kenya	1.8	Nigeria	3.9
	Botswana	1.4	Somalia	1.2	Eswatini	1.0	Botswana	3.9
	Ethiopia	1.0	South Sudan	0.6	Cameroon	0.8	Libya	3.1
	Senegal	0.9	Mauritania	0.2	Madagascar	0.7	Madagascar	2.7
	Morocco	0.8	Niger	0.2	Egypt	0.6	Kenya	1.8

Source: 2021 AATM database.

African countries do not figure among the top global exporters of dairy or poultry. In dairy products, European Union (EU) countries, New Zealand, and the United States (US) are dominant global exporters; within Africa, South Africa and Egypt are the key players (see Figure 4.17). Poultry is dominated globally by the EU countries, US, and Brazil. South Africa dominates the intra-African market for live birds, slaughtered and poultry cuts (see Figure 4.18). Zambia has notably increased its poultry exports recently, which Agriprofocus (2014) attributes to both demand and supply side factors. On the demand side, the domestic market expanded with the country's increasing population, rising disposable income, and rapid urbanization. On the supply side, production increased due to advances in poultry breeding, expansion of the small and medium firms that are the main suppliers of poultry, and the introduction of modern technology.

This analysis highlights some important implications. First, in the livestock value chains, African exporters generally perform well only in exports of live animals. Second, at the continental level, exports of dairy, poultry, and meat originate from just a few countries, indicating that these

sectors are highly concentrated. Third, on a different but pertinent note, the competitiveness of the livestock sector is eroded by outbreaks of animal diseases (avian influenzas and animal-source foodborne-diseases); inadequate production practices that degrade soil, water, and air; low capacity utilization of slaughter facilities; the high cost of feed for fattening animals; very low carcass weights; and meat quality factors. In response to these issues, the Food and Agriculture Organization of the United Nations (FAO) recently initiated a project entitled Africa Sustainable Livestock 2050 that is formulating a strategy to identify policy actions to ensure a sustainable livestock sector in the long term. It currently operates in Burkina Faso, Egypt, Ethiopia, Kenya, Nigeria, and Uganda. Expanding such initiatives to other countries and implementing them through the African Union will be crucial to improving the competitiveness of this sector. Moreover, if the AfCFTA adopts such initiatives, it will help mainstream trade policies in the conception and implementation of these development projects.

AFRICAN LIVESTOCK MARKETS: DESTINATIONS AND ORIGINS

As we examine the destinations and origins of African livestock product trade, we must bear in mind both the differences between intra-African trade and Africa's extracontinental trade and the prevalence of informal trade channels within Africa, especially for live animals. Figure 4.1 compared African livestock exports within and outside of Africa, and while the formal data indicate that extracontinental exports exceed intra-African exports by roughly half a billion dollars, this does not account for the unrecorded value of informal livestock trade, which could easily exceed its formal counterpart. With nearly 2.5 billion animals informally traded in the past decade in East Africa alone (according to limited FSNWG registers), the actual count and value of Africa's livestock trade remain unknown. International trade requirements for livestock products, including SPS and health requirements, plus low relative productivity in the sector overall, mean that only a few African countries are substantial exporters of livestock products to the rest of the world.

Intra-African livestock trade

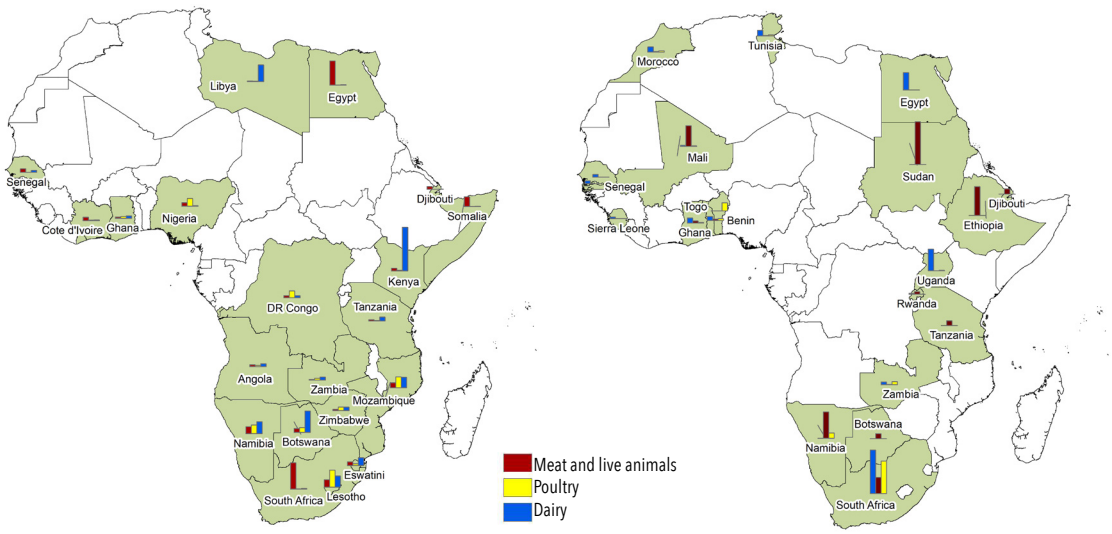
According to formal trade reports within the continent, African countries traded over $1.3 billion in livestock products among themselves annually between 2010 and 2019. Of that, close to $423 million was in live animals,[5] $177 million in carcasses and cuts, $97 in meat offal and hides and skins, $500 million in dairy, and $146 in poultry. Figure 4.14 illustrates the top importers and exporters geographically; countries with a green-toned background ranked in the top 10 importers and exporters in live animals, meat, and hides, and dairy and poultry. Regional traders, particularly countries within the same REC, share natural trade advantages due to REC trade agreements, geographic proximity, culture, and other factors, with notable regional hotspots of trade in southern and eastern Africa between neighboring countries (Figure 4.14).

5 Again, this statistic must be considered with caution, given the likely magnitude of intra-African informal trade of live animals.

Figure 4.14 Top intra-African importers and exporters of livestock products, annual average 2010–2019

(a) Top intra-African importers

(b) Top intra-African exporters

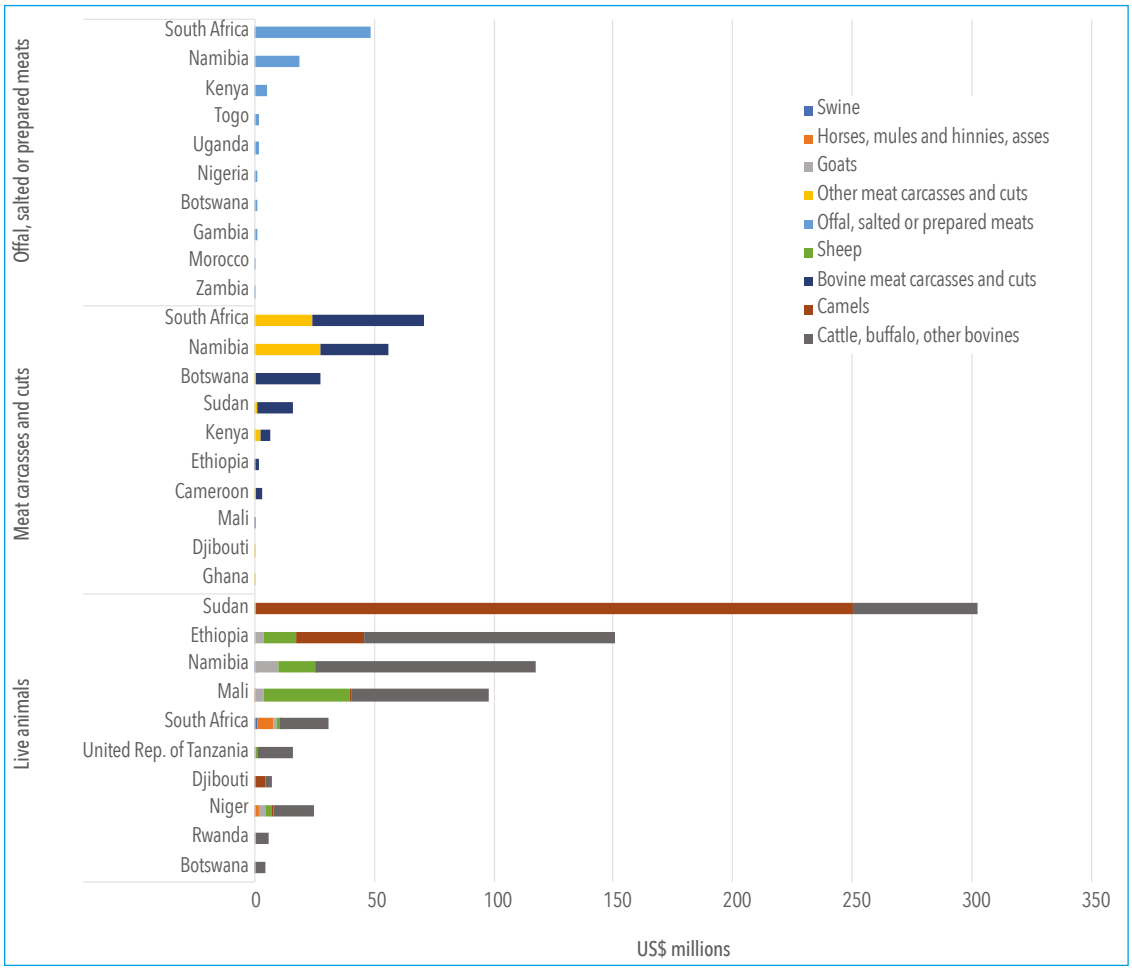


Source: Authors' own elaboration using the 2021 AATM database.

Meat and live animals

For formal trade of live animals, Sudan dominates the intra-African market, due to its $250 million annual average exports of camels, plus $50 million in live cattle. Ethiopia, Namibia, and Mali follow Sudan, each predominantly exporting cattle, though sheep exports also play an important role for these countries. The intra-African meat export market is far smaller in value. South Africa and Namibia are the largest players; both countries export bovine meat, as well as meat carcasses and cuts of other animals. South Africa and Namibia are also Africa's top intra-African exporters of offal, salted and prepared meats. Botswana and Sudan are the other significant intra-African meat exporters. Figure 4.15 identifies the top exporters for live animals and meat. In intra-African trade in hides and skins (not shown due to its smaller role), Rwanda ($3.6 million) and Botswana ($3.5 million) are the top exporters, followed by Sudan, Zimbabwe, and Tanzania (each exporting $2–3 million).

Figure 4.15 Top 10 intra-African exporters of live animals and meat, annual average 2010–2019

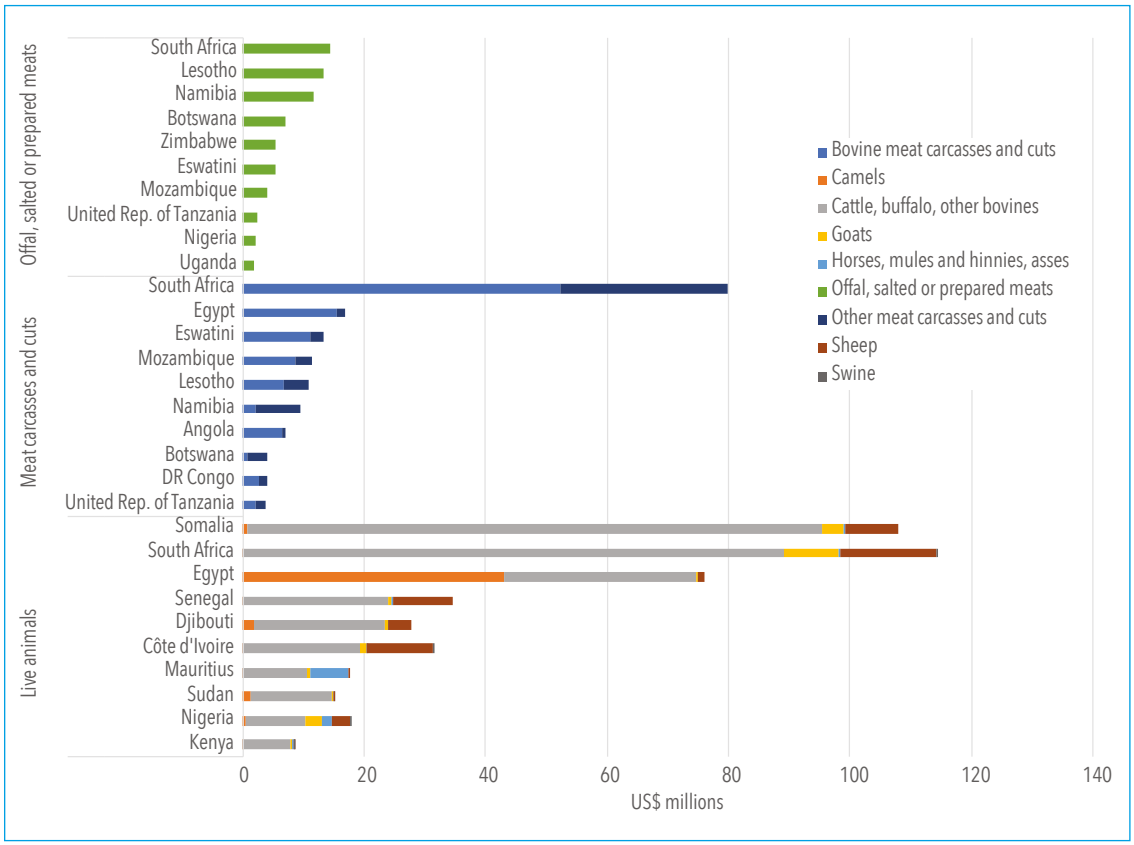


Source: 2021 AATM database.

Somalia and South Africa are the top importers of live animals, each importing around $90 million annually in cattle, plus a smaller value of live goats and sheep (Figure 4.16). Egypt imports $31 million in cattle, plus $43 million in camels. Senegal and Côte d'Ivoire in West Africa follow the top three importers, followed by Djibouti, where live animal imports may eventually make their way across the Red Sea to Saudi Arabia. In slaughtered animal imports, South Africa dominates, though its share fell significantly between 2010–2014, when it imported over $110 million (both in bovine meat and other animals), and 2015–2019, when its imports averaged $43 million. This drop may reflect increased animal processing (slaughter) capacity within South Africa over the last decade[6]; average live animal imports to South Africa rose by approximately $50 million between the two time periods, potentially displacing meat imports. Offal and highly processed or prepared meats play a smaller role in intra-African trade, with no country surpassing $20 million in imports. South Africa is both a top importer and the top exporter of prepared meats, though its imports decreased between 2010 and 2019. In hides and skins (not shown), South Africa is also the largest importer ($6 million annual average), followed by Nigeria ($4.3 million), Uganda ($2.5million), and Kenya ($2.2 million).

6 For further details, see https://www.brookings.edu/blog/africa-in-focus/2020/09/17/easy-meat-the-case-of-the-pork-industry-in-south-africa/ .

Figure 4.16 Top intra-African importing countries, animals and meat, annual average 2010–2019

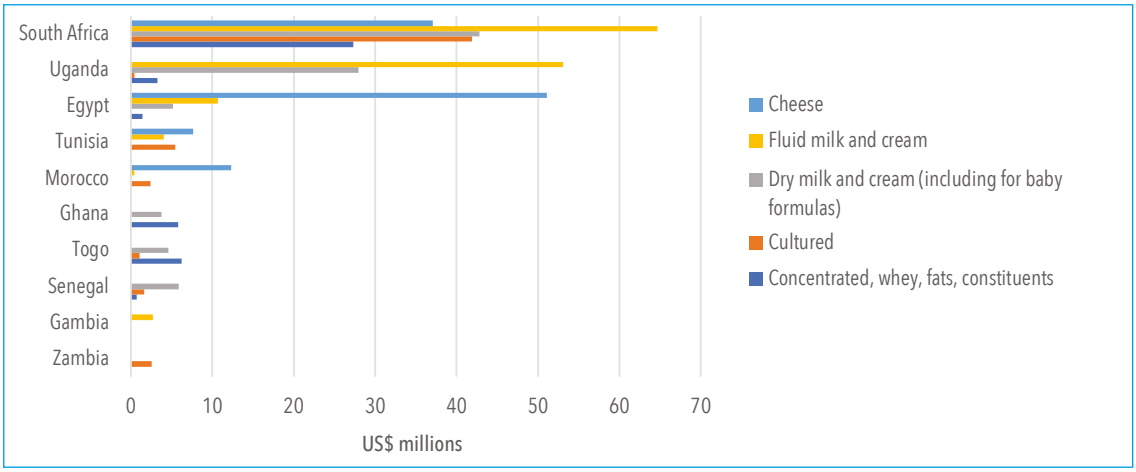


Source: 2021 AATM database.

Dairy and poultry

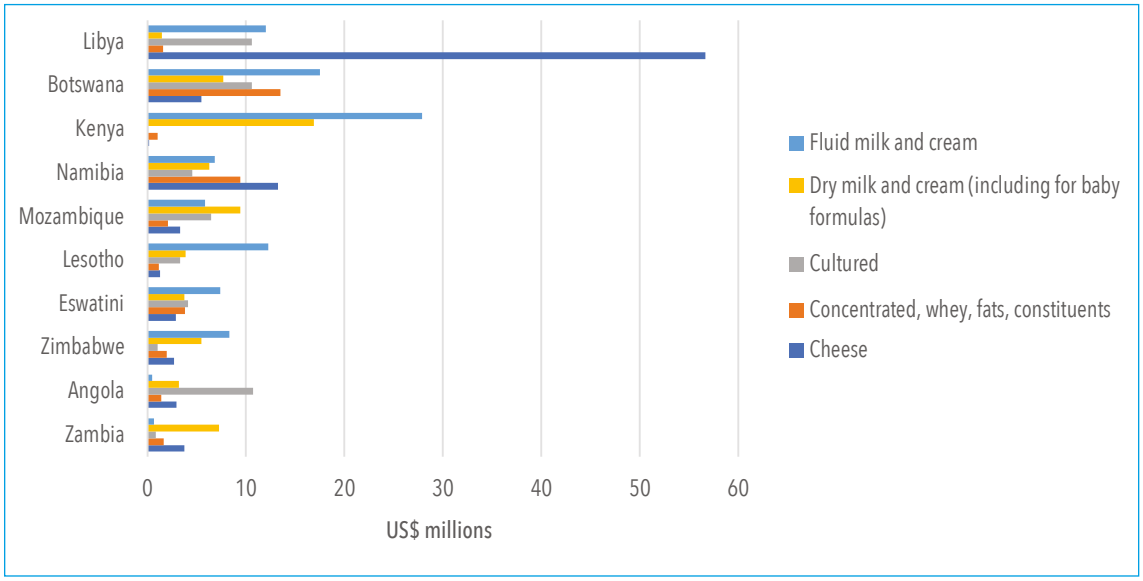
In dairy (Figures 4.17 and 4.18), South Africa is the dominant intra-African exporter, averaging nearly $225 million annually for all dairy exports. Unlike other intra-African top dairy exporters, South Africa exports a balanced mix of fluid milk, dry milk powders, cheese, and cultured and concentrated milk products. The second-ranked exporter, Egypt, predominantly exports cheese to other African countries, as do Tunisia and Morocco. Africa's third-ranked exporter, Uganda, exports predominantly fluid milk, followed by dry milk powders. Libya is Africa's top intra-African dairy importer, largely importing cheese.

Figure 4.17 Top 10 intra-African dairy exporters, annual average 2010–2019



Source: 2021 AATM database.

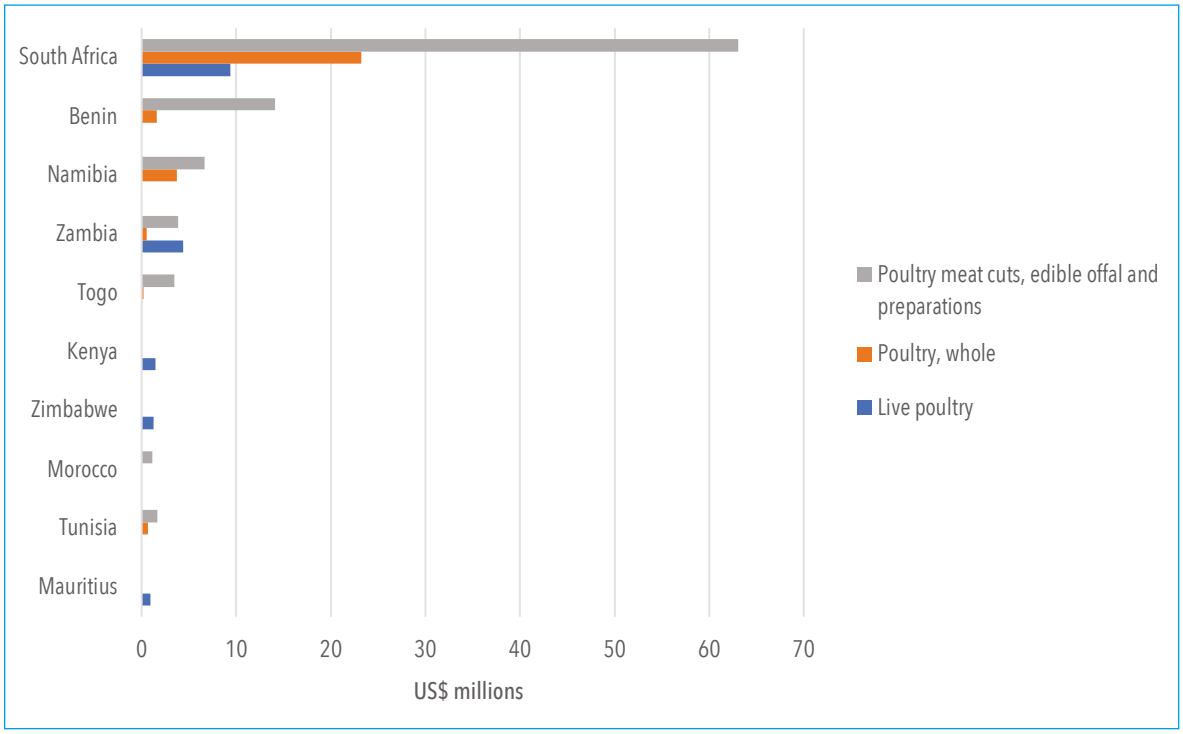
Figure 4.18 Top intra-African dairy importers, annual average 2010–2019



Source: 2021 AATM database.

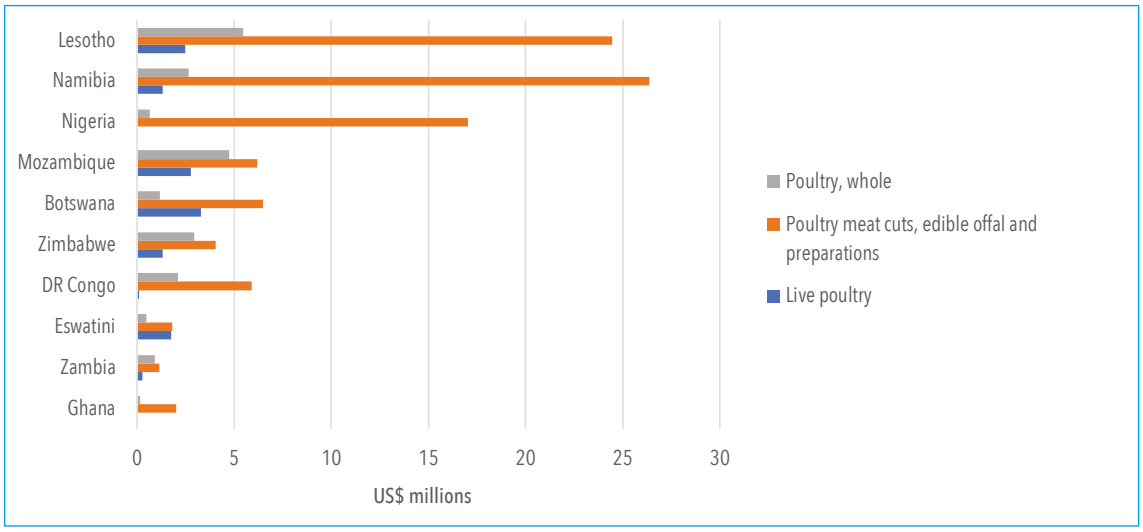
In poultry (Figures 4.19 and 4.20), South Africa is again the leader, dominating the formal intra-African market in poultry cuts, whole birds, and live chickens, with a total of $102 million in exports annually. Benin is the only other significant exporter, with $33.5 million in average annual poultry exports. Lesotho, Nambia, and Nigeria are the top importers. Here again, the actual quantities and economic values are unknown, given that African poultry markets are largely domestic, and cross-border trade in chicken is largely informal.

Figure 4.19 Top 10 intra-African poultry exporters, annual average 2010–2019



Source: 2021 AATM database.

Figure 4.20 Top intra-African poultry importers, annual average 2010–2019

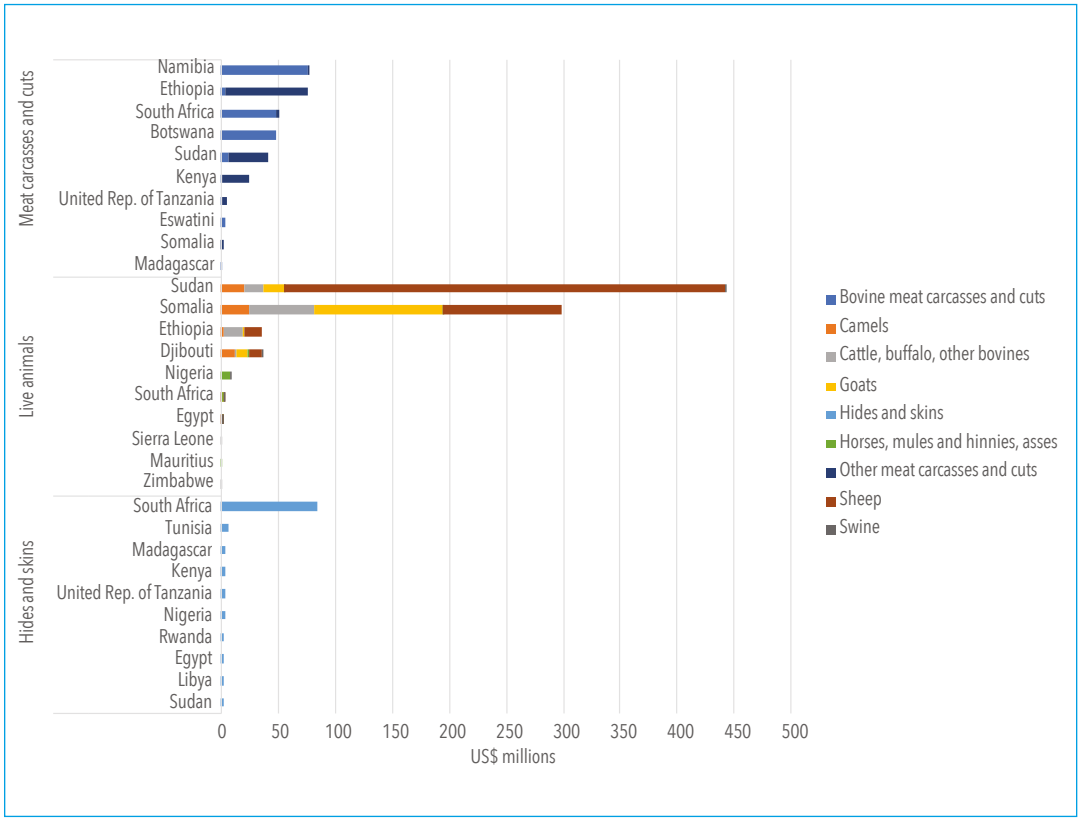


Source: 2021 AATM database.

Livestock trade between Africa and ROW

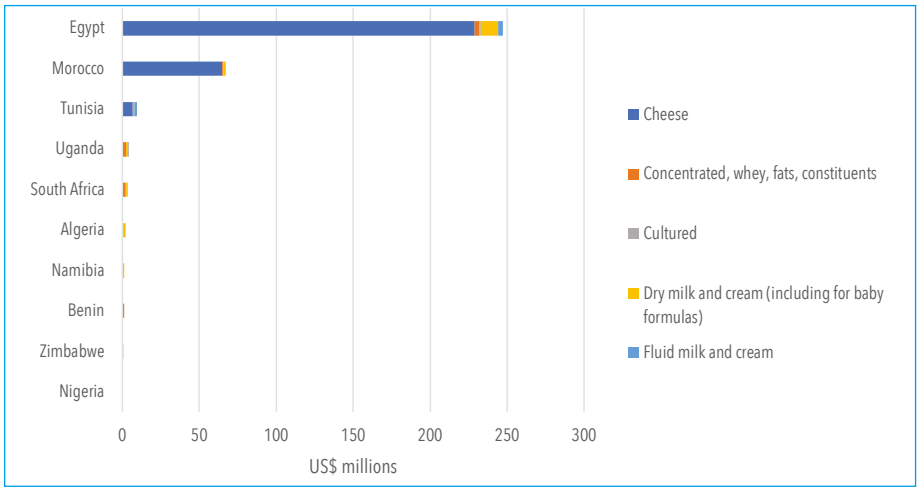
Africa's top exports to the rest of the world include live animal exports from Sudan (predominantly sheep, $387 million annual average) and Somalia (sheep, goats, cattle, and camels), and cheese from Egypt ($277 million). A handful of countries — Namibia, Ethiopia, South Africa, Botswana, Sudan, and Kenya — export between $24 and $77 million annually in meat carcasses and cuts. South Africa is the only country that exports more than a few million dollars worth of hides and skins (Figure 4.21).

Figure 4.21 Top African exporters of meat and live animals to ROW, annual average 2010–2019



Source: 2021 AATM database.

Figure 4.22 Top African exporters of dairy to ROW, annual average 2010–2019



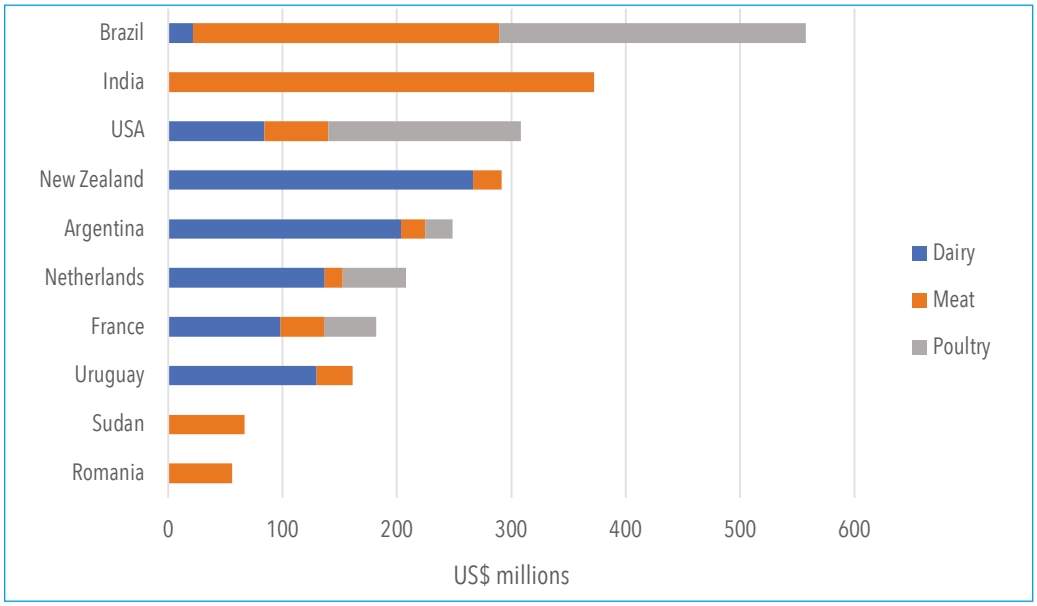
Source: 2021 AATM database.

In poultry (not shown), only two countries export more than $1 million on average annually of slaughtered poultry — Egypt ($10 million) and South Africa ($3.5 million). For live birds, Somalia exports an annual average of $2 million.

Origins of African global imports

For African countries that import livestock products, Brazil, India, US, New Zealand, Argentina, and EU countries dominate overall (Figure 4.23), yet import origins are particular to the specific commodity type and its processing level. Sudan is the only African country to make the top 10 among origin countries for African imports, highlighting the degree to which Africa misses an opportunity within its own regional markets — again, with the caveat that these figures do not reflect informal regional markets. Figures 4.24 and 4.25 break down the product groups with more detail.

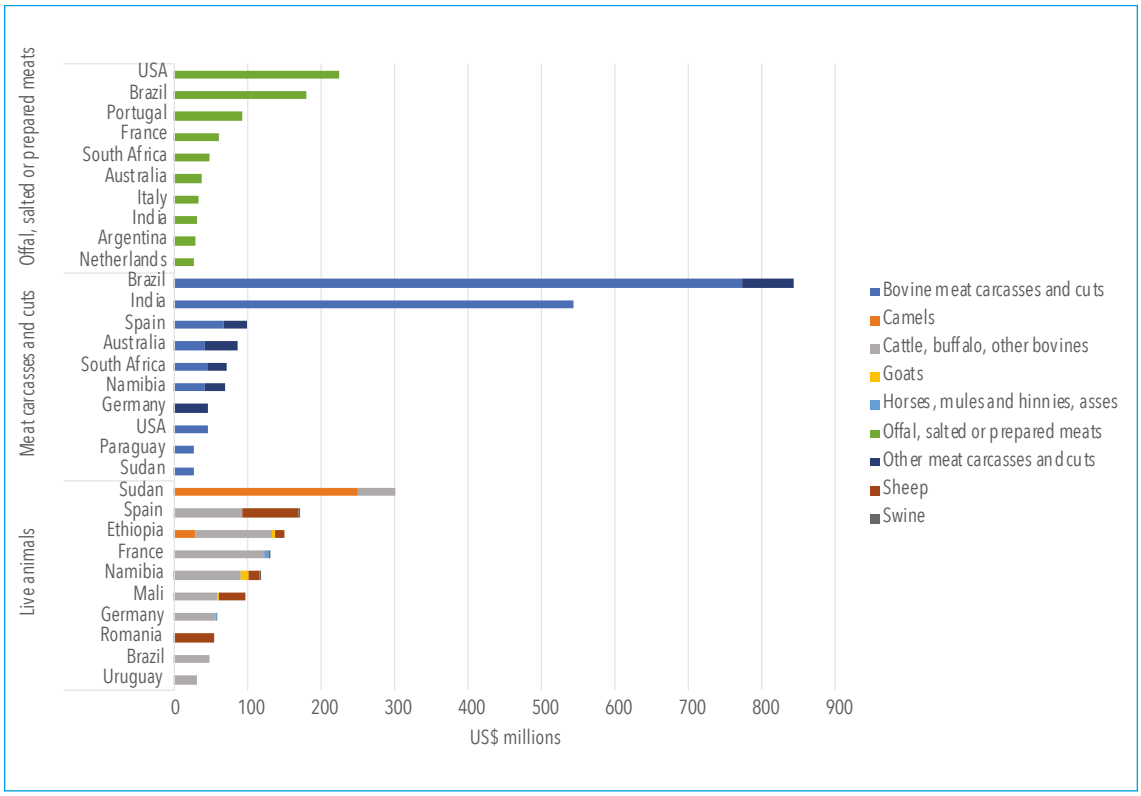
Figure 4.23 Top origin countries of African livestock product imports, annual average 2010–2019



Source: 2021 AATM database.

While Brazil and India clearly dominate the African import market for meat carcasses and cuts, the US (followed by Brazil) is the dominant origin for (often lower-quality) meat offal as well as prepared meats, such as cured meats and other highly processed meat products. In live animal imports, four African countries — Sudan, Ethiopia, Namibia, and Mali — are major suppliers of African camel and cattle imports, as well as some sheep and goats. EU countries — Spain, France, Romania, and Germany — also export live cattle and sheep to Africa, as do Brazil and Uruguay. The available data do not specify the breed of animals or at what stage of animals' development countries typically import live animals from outside of Africa; but given the difficulty of shipping live animals overseas, imports are likely specialized breeding stock.

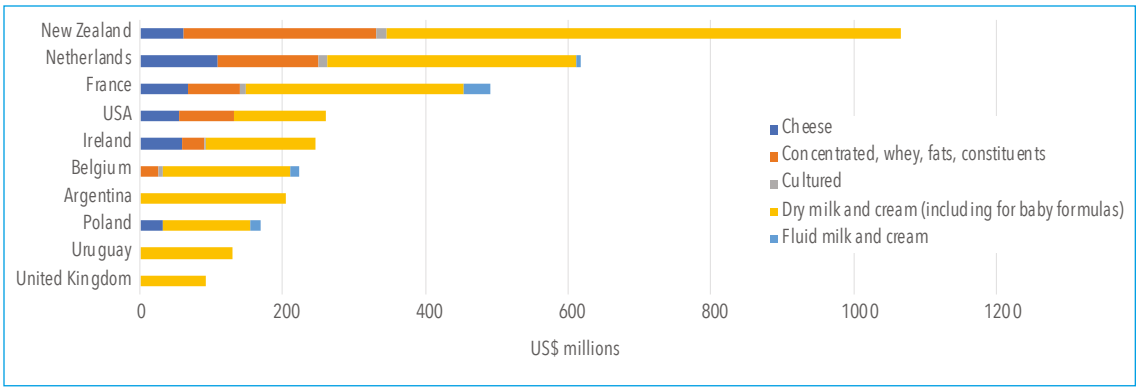
Figure 4.24 Top origin countries of African meat and live animal imports, annual average 2010–2019



Source: 2021 AATM database.

In dairy, New Zealand and EU countries — Netherlands, France, Ireland, Belgium, and Poland — account for most of Africa's imports, along with the US and South America. Unlike live animals, meat, and poultry imports, no African countries are among the top origin countries of the continent's dairy imports. Most dairy imports are in the form of dry milk powders (including for baby formula), totaling more than $2.3 billion of the $3.5 billion annual average dairy imports. Concentrated milk accounts for $620 million of average annual dairy imports, followed by $382 million in cheese imports.

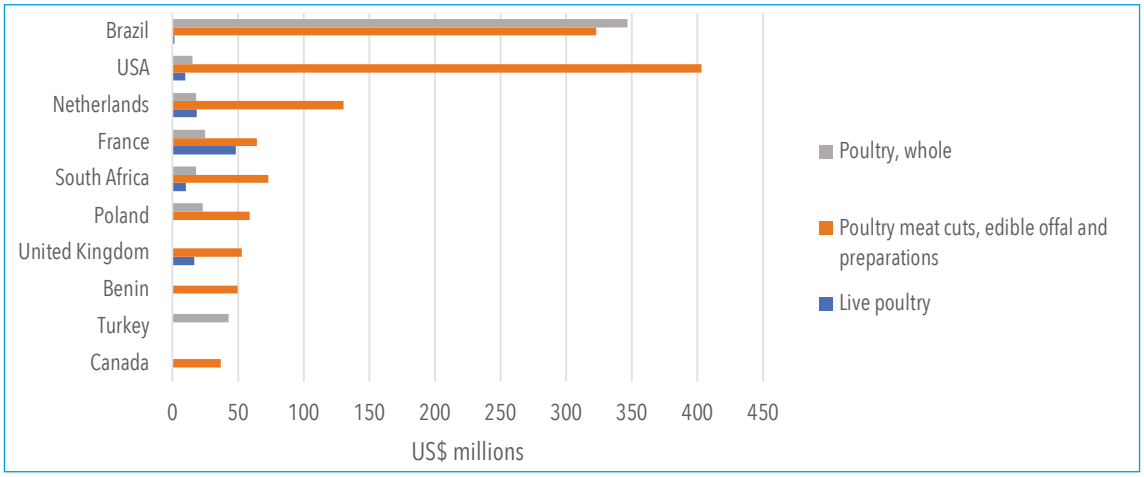
Figure 4.25 Top origin countries of African dairy imports, annual average 2010–2019



Source: 2021 AATM database.

African imports most poultry in the form of cuts, offal and preparations. While some cuts may have higher value, these imports are primarily lower-value offal, including feet, backs, and gizzards. However, between 2010 and 2019, Africa also imported $489 million on average as whole (slaughtered) birds (Figure 4.26). A few countries account for the continent's average annual $105 million imports of live birds. South Africa and Benin are the only regional countries to make the list of top global poultry origins. Brazil, the US, and EU countries are the primary origins of African poultry imports. However, African poultry markets are largely domestic, in part due to protective bans and trade barriers in African countries (see next section on trade policies for more details). Again, for poultry, the existing cross-border trade within Africa is largely informal, with quantities and economic values largely unknown.

Figure 4.26 Top origin countries of African poultry imports, annual average 2010–2019

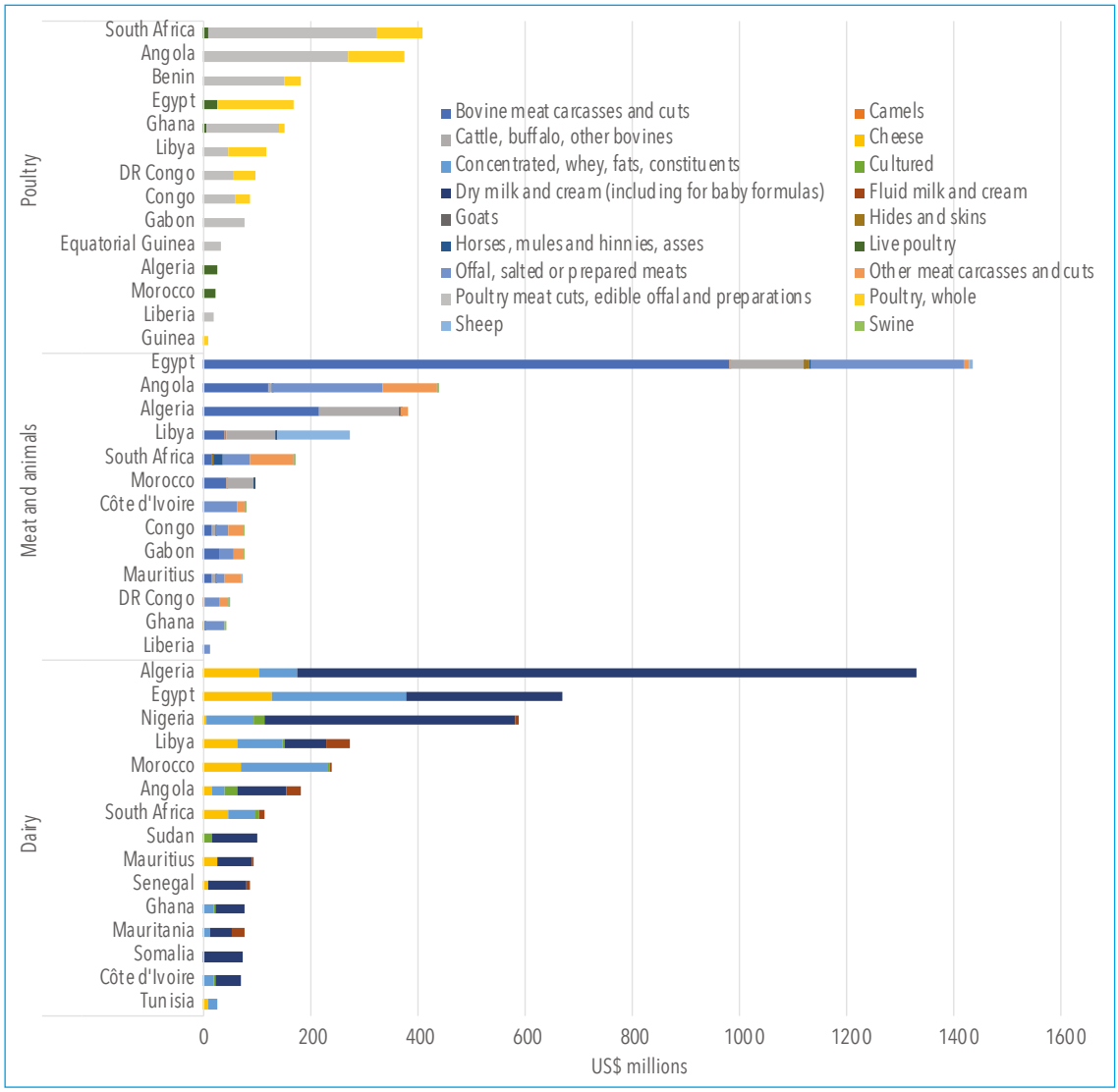


Source: 2021 AATM database.

Top African importers from ROW

Finally, we briefly examine which African countries import most heavily from the rest of the world (Figure 4.27). Theoretically, these countries offer opportunities for expanding the intra-African export market if African products could displace imports from ROW. However, many challenges exist. Seaport access and the proximity of Egypt and the Arab Maghreb Union countries to Europe and the Middle East make them natural trading partners, especially when faced with the transportation barrier of the Sahara for trade with Africa south of the Sahara. Moreover, African producers may lack the capacity to meet regional demand, or intra-African trade may be stymied by other persistent trade barriers.

Figure 4.27 African countries importing more than US$10 million in livestock products, annual average 2010–2019

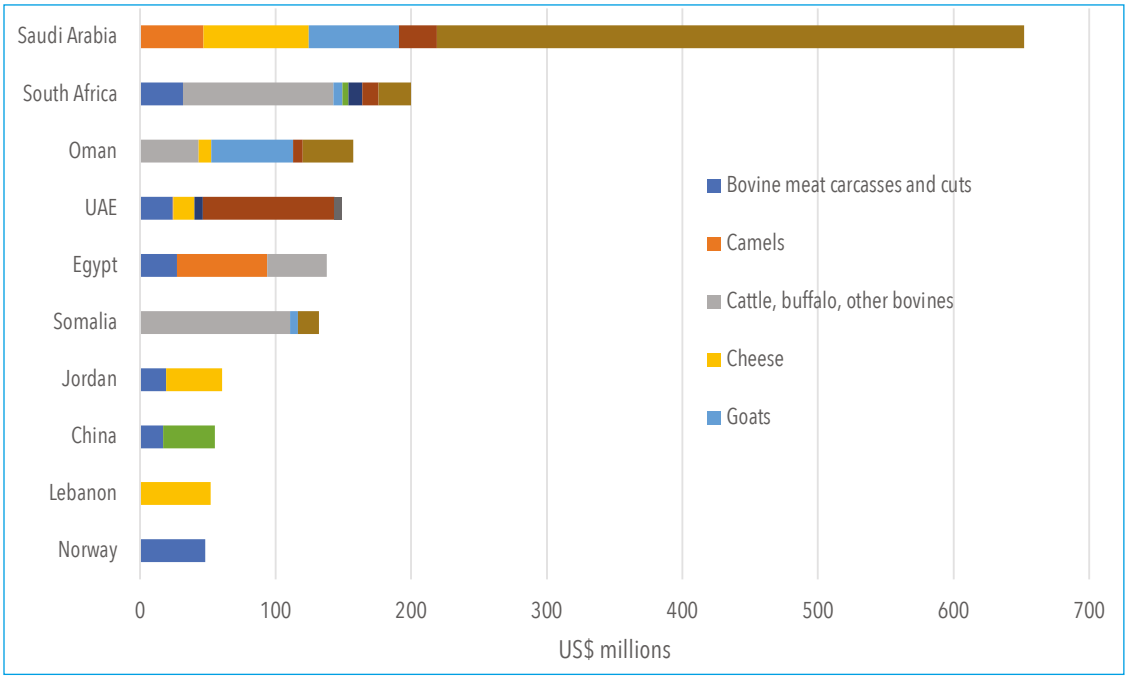


Source: 2021 AATM database.

African global livestock export destinations

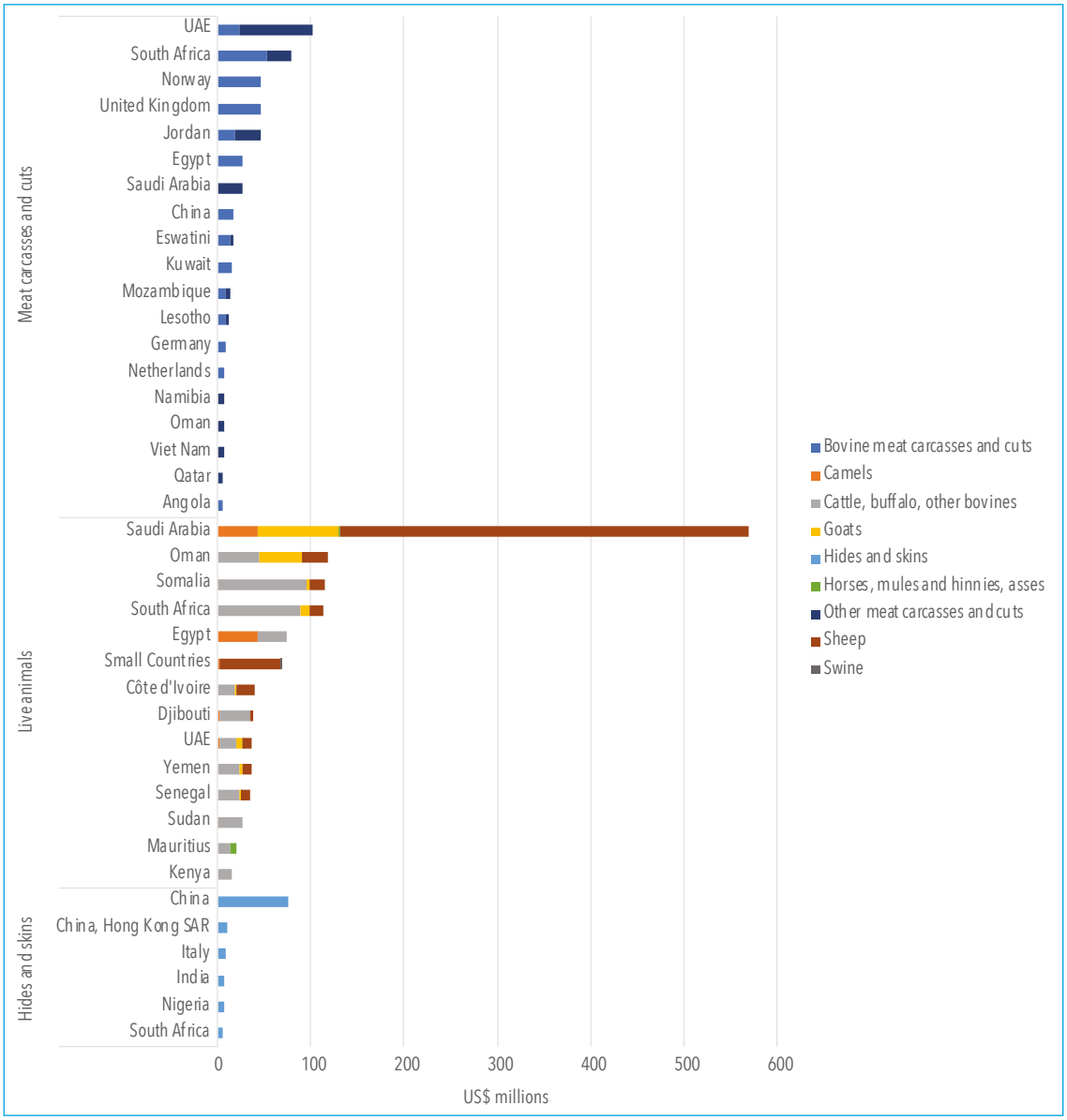
African countries export close to $1 billion annually in meat and animals, dairy, and poultry products, overwhelmingly to Saudi Arabia. Other major destinations outside of the continent include the United Arab Emirates (UAE) and Oman. Saudi Arabia and other arid Middle Eastern countries have invested heavily in Sudanese agriculture, and benefit from Sudan's cheap food exports — especially exports of water-intensive products. Three African countries are among the top 10 destinations for African livestock product exports: South Africa, Somalia, and Egypt. Figure 4.28 summarizes the top destinations for Africa exports, and Figures 4.29, 4.30, and 4.31 break down the top import destinations by each commodity category.

Figure 4.28 Top 10 destinations for African livestock product exports, annual average 2010–2019



Source: 2021 AATM database.

Figure 4.29 Top global importers of African meat and animal products, annual average 2010–2019

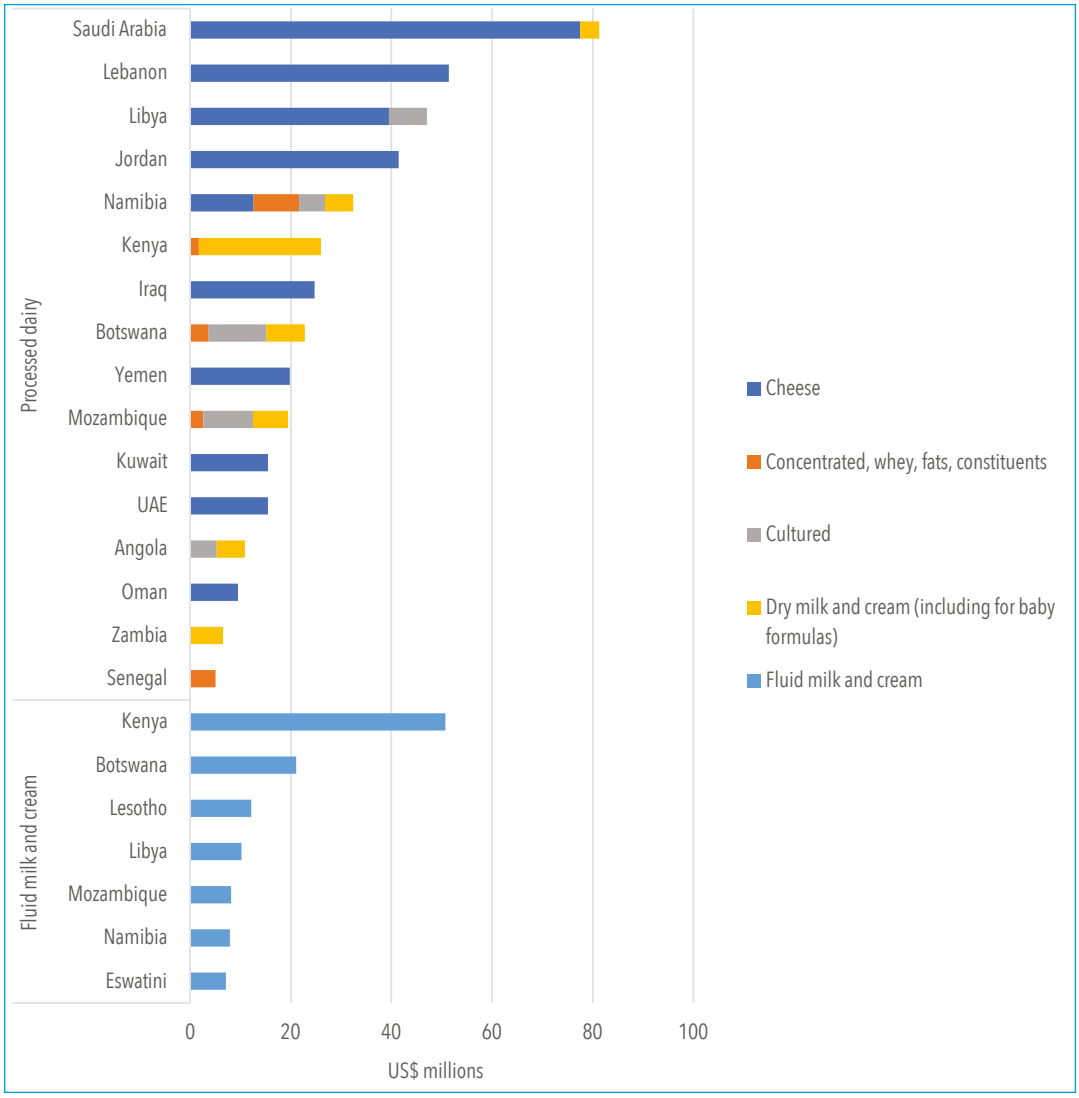


Source: 2021 AATM database.

Outside of African countries, Saudi Arabia, Yemen, and the UAE import the bulk of Africa's extracontinental live animal exports (Figure 4.29). The UAE, United Kingdom, Norway, and Jordan import the bulk of the extracontinental meat exports, and China (and Hong Kong) is Africa's primary destination for hides and skins, followed by Italy and India.

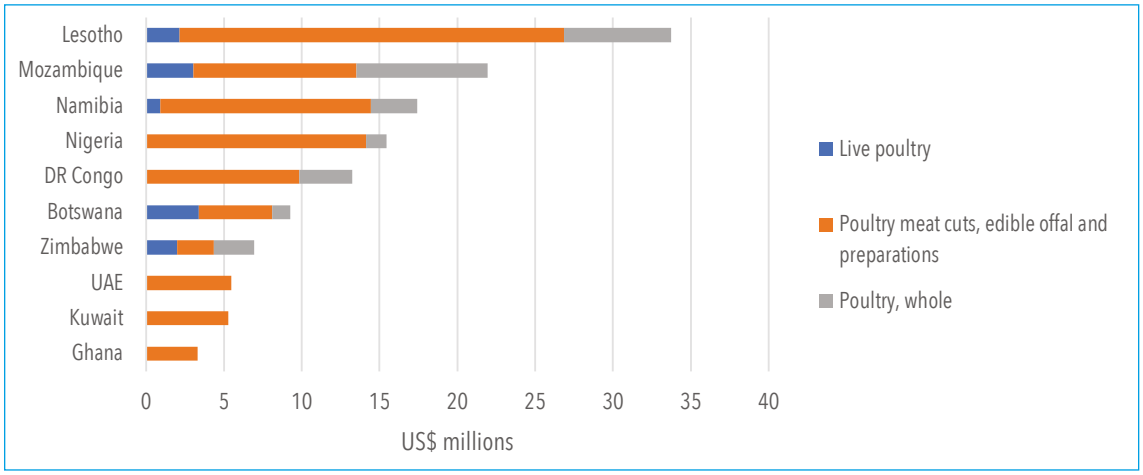
For dairy products (Figure 4.30), Saudi Arabi again is Africa's top destination outside the continent, followed by Lebanon, Jordan, Iraq, and Yemen. However, $288 million of Africa's $472 million in dairy exports, roughly 61 percent, remains on the continent. For poultry (Figure 4.31), the UAE, Yemen, Kuwait, and Hong Kong (China) are the only extracontinental importers among Africa's top 10 poultry importers.

Figure 4.30 Top global importers of African dairy products, annual average 2010–2019



Source: 2021 AATM database.

Figure 4.31 Top global importers of African poultry products, annual average 2010–2019



Source: 2021 AATM database.

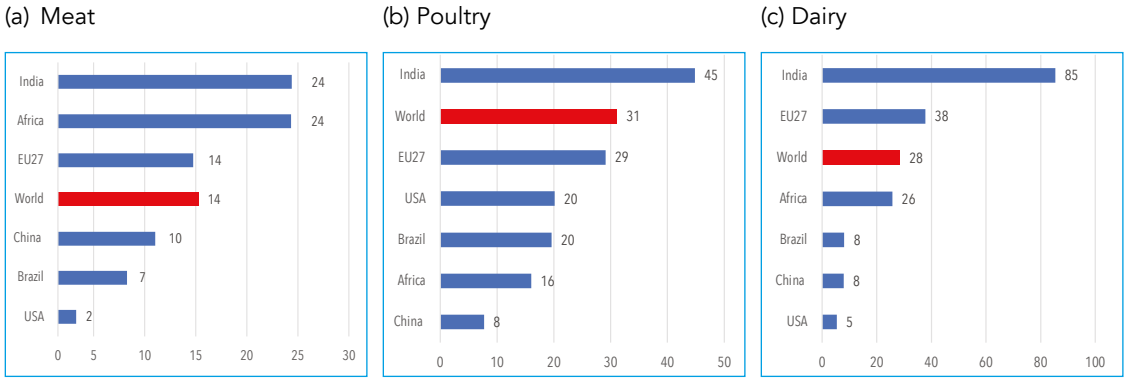
TRADE POLICIES

To understand the dynamics behind the trade flows presented above, it is important to consider the trade policies of African countries and their main trading partners. This section examines both tariffs and NTMs that affect meat, poultry, and dairy products. Before examining the various dimensions of trade policy, it is worth noting that, in a competitive market, the most important determinant of competitiveness is cost of production, which is a function of technology, productivity, production efficiency, and prices of inputs and products, and in turn is influenced by tradability. Thus in Africa, while tariff, domestic support, and NTMs might have a distortive effect on trade in livestock products, African countries should first address the domestic factors that impede their competitiveness in the sector. Though global tariffs ultimately pose the smallest barriers to Africa's livestock product export markets, we examine them briefly here, as well as other nontariff barriers.

Tariffs

Figure 4.32 compares the tariffs imposed by the largest global producers of livestock products. Generally, India is the most protectionist, with a tariff of 24 percent on meat, 85 percent on poultry, and 45 percent on dairy products. The EU27[7] ranks second after India, with a tariff of 38 percent for poultry and 29 percent for dairy products. Moreover, while Africa's tariffs are low for dairy (16 percent; only higher than China, where tariffs are 8 percent), Africa imposes a high tariff on meat (24 percent) and on poultry (26 percent) in comparison to other countries. In contrast, while the US is protectionist for dairy products, it imposes low tariffs on meat (2 percent) and poultry (5 percent).

Figure 4.32 Tariffs on livestock products, 2016 (%)



Source: Constructed using MAcMap-HS6 and authors' calculation.

Given that, across this chapter, we compare live animals to products that are relatively more processed, it is important to consider whether the livestock sector faces tariff escalation. This refers to a situation where tariffs rise along processing chains: when tariffs imposed on processed products are higher than those imposed on live animals, tariffs are escalating; if tariffs decrease along the value chain, it is referred to as tariff abatement. Tariff escalation is of growing importance since it impedes export of more processed products, making it difficult for countries to shift away from exporting primary products.

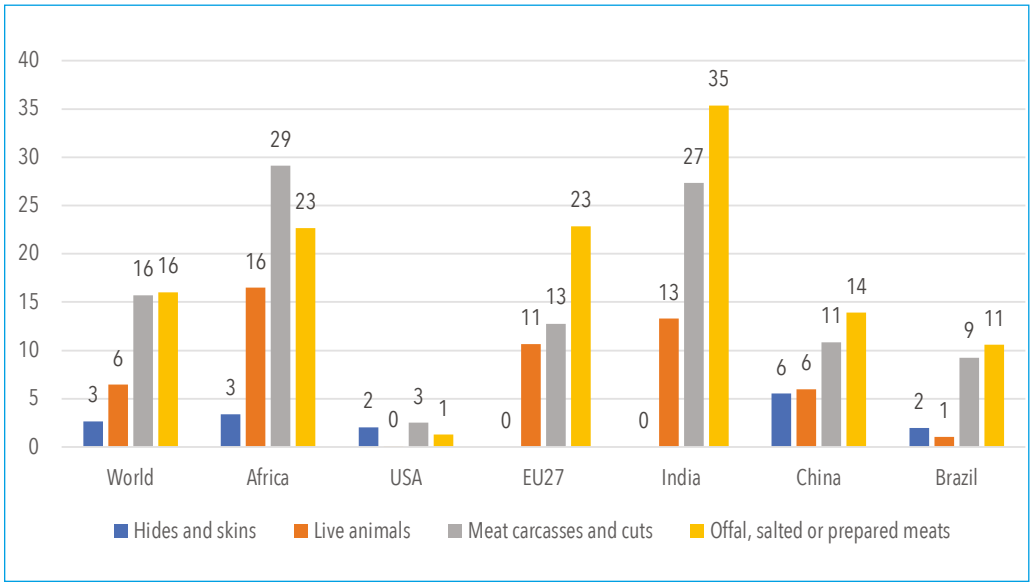
For the meat sector, Figure 4.33 shows that tariff escalation is observed for all countries. Tariffs are higher for offal, salted and prepared meats than for cuts, carcasses, live animals, or hides and skins, except in Africa. The highest tariff is imposed by India on meat preparations (as high as 32 percent). Moreover, the EU is generally more protective for all products and all types of meat

7 The EU27 refers to the European Union countries, except the United Kingdom.

than the US (23 percent vs. 1 percent for meat preparations; 13 percent vs. 3 percent for cuts and carcasses; and 11 percent vs. zero for live animals). Within Africa, while live animals are subject to a tariff of 16 percent (especially camels at 5.3 percent and cattle at 20.4 percent; see Table A4.2 in the appendix), meat preparations are less protected than cuts and carcasses (23 percent and 29 percent, respectively).

Despite the high tariffs imposed by the EU27, most African countries benefit from the preferential access granted by the Everything But Arms (EBA) scheme. The EBA grants least developed countries (LDCs) duty- and quota-free access for almost all products (arms and ammunition excluded). Similarly, the US African Growth and Opportunity Act (AGOA) initiated in 2000 (and renewed to 2025) grants several African countries duty-free access to the US market for certain agricultural products. Nevertheless, as will be shown later, African exports face several NTMs (ranging from SPS measures to rules of origin) imposed by the US and EU that erode their competitiveness. Yet, even when African exporters have achieved SPS standards and face no tariffs, the low productivity of African countries has prevented them from meeting EU and US import demand (that is, they rarely reach the full import quotas allowed). In fact, the low tariffs in places like the US and Brazil may reflect their own high productivity in poultry and meat, which makes it difficult for other countries to compete.

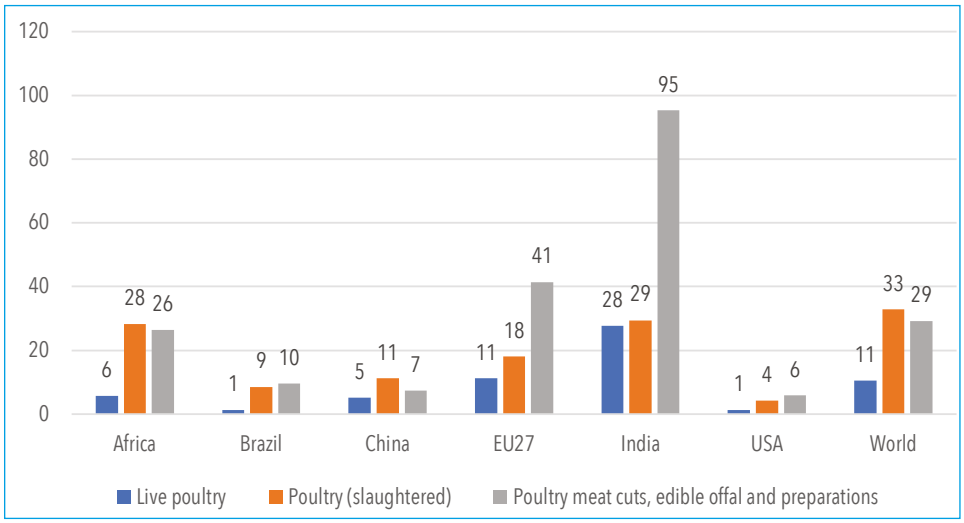
Figure 4.33 Tariffs imposed on meat products, 2016 (%)



Source: Constructed using MAcMap-HS6 and authors' calculation.

For all poultry products, the EU and India have the highest level of protection. In addition, tariff escalation holds for most countries, though with different magnitudes. For instance, in Europe, live poultry is subject to a tariff of 11 percent, slaughtered poultry faces a tariff of 18 percent, and cuts and preparations 41 percent. The difference across the value chain is smaller for Brazil and the US. In contrast, Africa and China exhibit tariff abatement, with tariffs on cuts and preparations lower than on slaughtered animals (Figure 4.34).

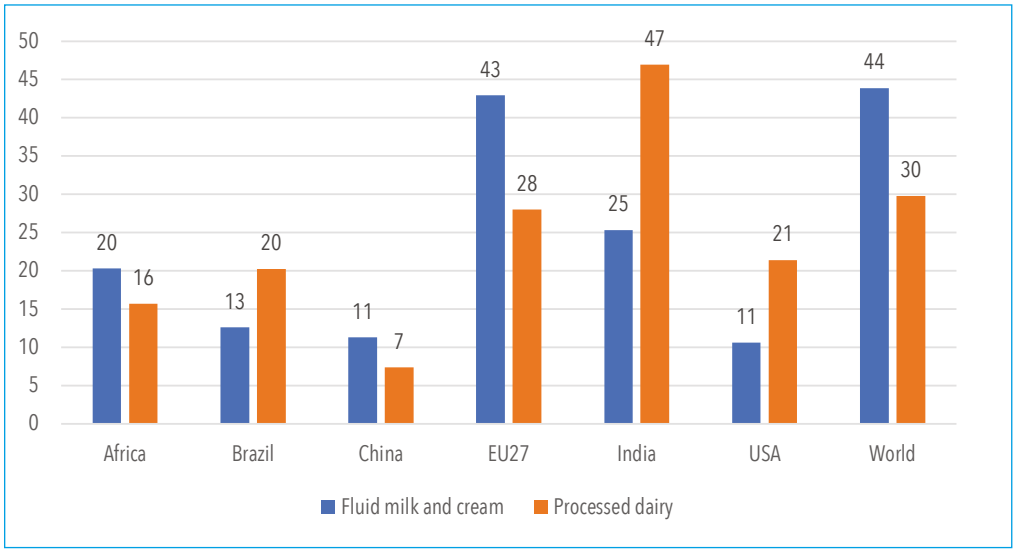
Figure 4.34 Tariffs imposed on poultry products, 2016 (%)



Source: Constructed using MAcMap-HS6 and authors' calculation.

For dairy products, some countries are characterized by tariff abatement, with processed products less protected than fluid milk and cream (Figure 4.35). This holds for the EU (especially fluid cream, with a tariff of 42.5 percent), China, and Africa. In contrast, the US, India, and Brazil are characterized by tariff escalation, with India the most protected country (47 percent tariff on processed dairy products[8]).

Figure 4.35 Tariffs imposed on dairy products, 2016 (%)



Source: Constructed using MAcMap-HS6 and authors' calculation.

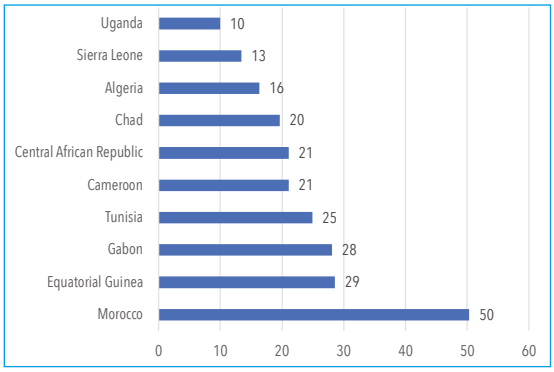
Within Africa, tariffs continue to hinder trade despite establishment of the RECs. For instance, for live animals, the highest tariffs are imposed by Morocco (50 percent), Equatorial Guinea (29 percent), and Gabon (28 percent). Hides and skins face a lower tariff on average within Africa, with Djibouti imposing the highest tariff of 29 percent. For offal and meat, Morocco is also the most protected (Figure 4.36). In the poultry sector (Figure 4.37), tariffs are also especially high in Morocco (28 percent on live poultry, 45 percent on cuts and offal, and 40 percent on slaughtered poultry) as well as ECOWAS countries (with a tariff of 35 percent on slaughtered poultry and cuts

8 India imposes a high tariff, compared to other countries, on dry milk (58.1 percent) and cheese (28.6 percent).

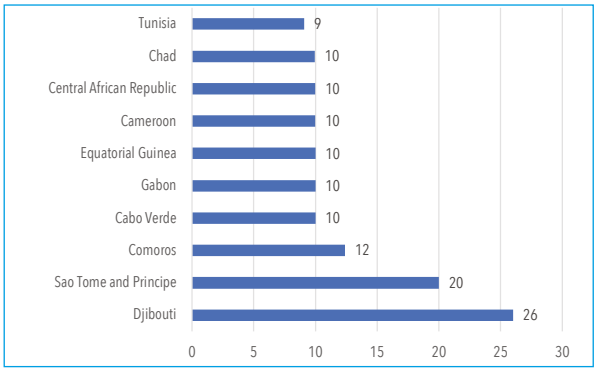
and offal). Processed dairy products are characterized by a higher tariff within Africa, especially in the case of SADC countries whose tariffs are 70 percent (Figure 4.38). Yet, it is important to note that these tariffs are those of 2016. With the ratification of the AfCFTA, starting from July 1, 2020, tariffs on 90 percent of goods traded are supposed to decrease until they are eliminated within 10 years for least developed countries (LDCs) and 5 years for non-LDCs (except for sensitive goods, for which tariffs will be lowered within 13 years for LDCs and 10 years for non-LDCs). Obviously, the AfCFTA will play an important role in reducing intra-African tariffs and thus in boosting exports and imports at the continental level.

Figure 4.36 Intra-African tariffs imposed on meat, 2016 (%)

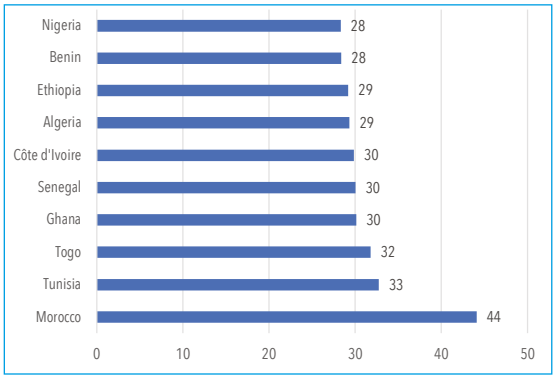
(a) Live animals



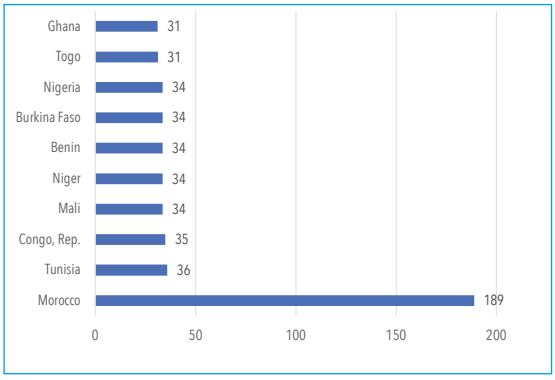
(b) Hides and skins



(c) Offal, salted or prepared meats



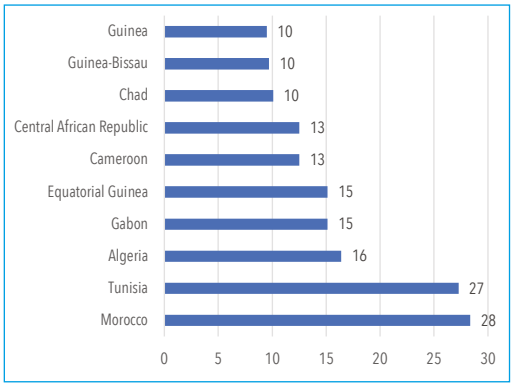
(d) Meat carcasses and cuts



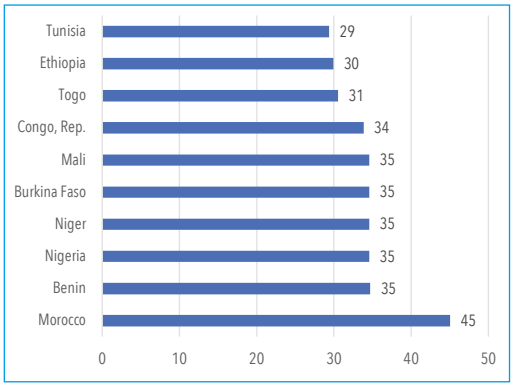
Source: MAcMap-HS6 and authors' calculation.

Figure 4.37 Intra-African tariffs imposed on poultry, 2016 (%)

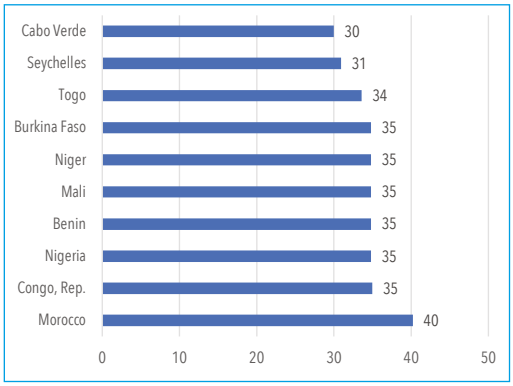
(a) Live poultry



(b) Poultry meat cuts, edible offal and preparations



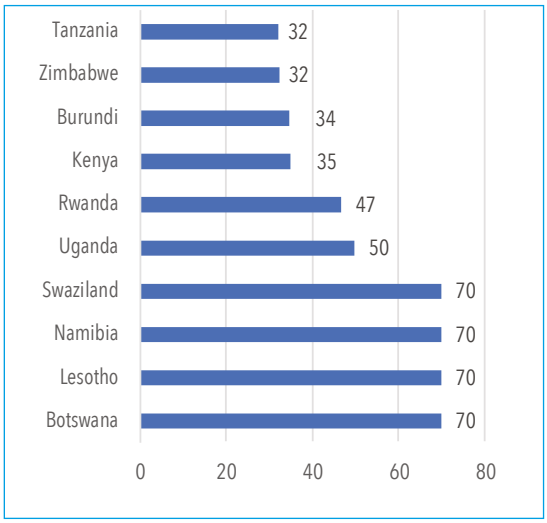
(c) Poultry, whole



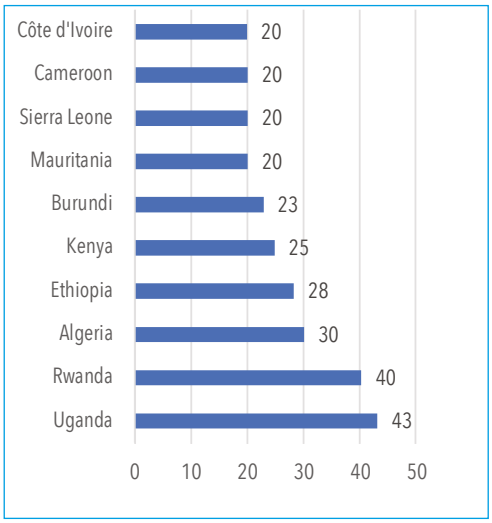
Source: MAcMap-HS6 and authors' calculation.

Figure 4.38 Intra-African tariffs imposed on dairy, 2016 (%)

(a) Processed dairy



(b) Fluid milk and cream



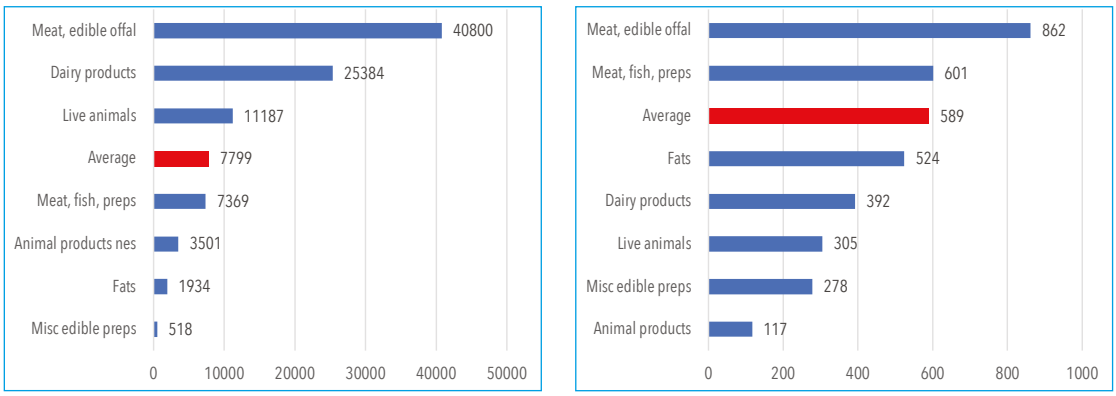
Source: MAcMap-HS6 and authors' calculation.

Nontariff measures

While tariffs remain an issue, the livestock sectors of interest face NTMS that are more restrictive. However, we note that if a country is able to comply with the health standards imposed by the main trade partners, it should be able to export without difficulties and NTMs will not be a serious trade impediment. Figure 4.39 shows that the EU and US, respectively, impose 862 and 40,800 NTMs on meat and edible offal, and 392 and 25,384 NTMs on dairy products. More specifically, Table 4.4 summarizes the types of NTMs imposed by the EU and US. These include SPS measures, TBTs, and pre-shipment controls. Obviously, while SPS measures represent 75 and 95 percent of the total number of measures imposed by the EU and US, respectively, the number of measures imposed by the US is much larger. However, edible meat (HS2-02) is subject to more NTMs in the EU, followed by meat preparations (HS2-16) and live animals (HS2-01). These results corroborate our previous finding that higher value-added products face greater protection.

Figure 4.39 Number of nontariff measures imposed by EU and US in the agriculture sector, 2018

(a) EU27 (b) US



Source: Data from UNCTAD 2017.

Note: Preps = preparations; nes = not elsewhere specified.

While the number of NTMs is a useful indicator, it is important to calculate the ad valorem equivalent (AVE), that is, the tariff equivalent of these trade barriers, to measure the additional costs that NTMs put on imports (see Chapter 2 for a discussion of AVEs). Figures 4.40 and 4.41 present the AVEs of SPS measures and TBTs respectively for our sectors of interest, as calculated by Nguyen, Bouët, and Traoré (2020). For instance, SPS measures imposed by the US add some 63 percent to the cost of imports, and TBTs add 84 percent. In the EU, these AVEs are slightly lower, at 48 percent for SPS measures and 62 percent for TBTs.[9] Similar AVEs, but slightly lower, apply for live animals and dairy products. Within Africa, NTMs are also costly, ranging from 37 percent for SPS measures in Cabo Verde for edible meat to 146 percent for TBTs in Gambia for meat preparations. This is why, in order to boost African trade in these products, reforms must be implemented in both the origin and destination countries. But increasing trade will also require greater investment in infrastructure, coordination, and capacity to meet global SPS and other NTMs.

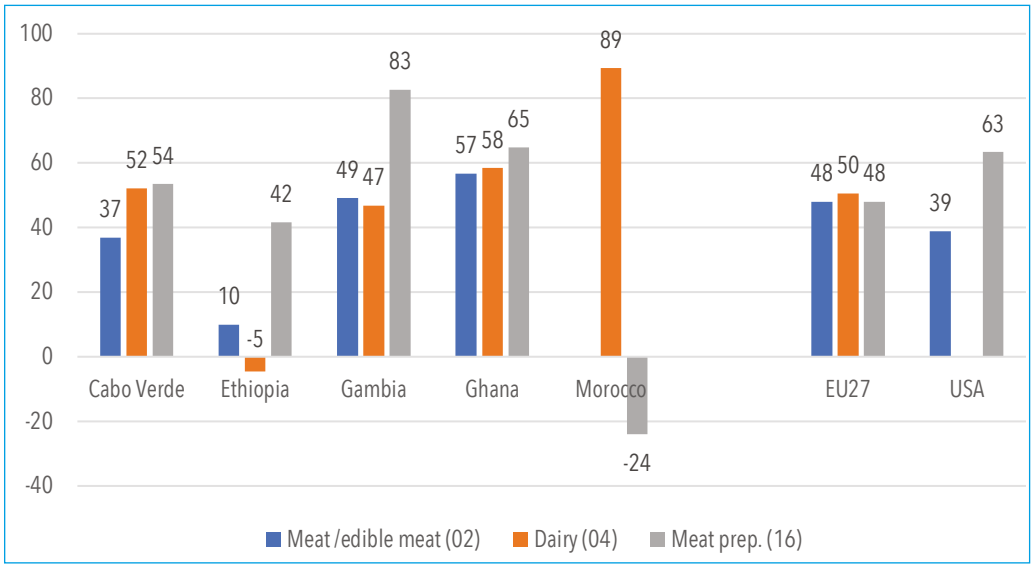
9 These measures include: approving the exporting establishment under food-hygiene regulations and listed for export purposes, labeling, registering for Export Health Certificate (EHC) online, a prenotification of goods arriving (done by EU-based importer), and the control of residues of veterinary medicines in animals and animal products for human consumption.

Table 4.4 Number of nontariff measures imposed by EU and US, 2018

	Animals live (HS2 01)	Meat /edible meat (HS2 02)	Dairy prod. (HS2 04)	Meat prep. (HS2 16)	Total
SPS	232	667	300	410	1,609
TBT	39	66	33	89	227
Pre-shipment	0	0	0	2	2
Quantity control	34	129	59	100	322
Total	305	862	392	601	2,160
SPS	10,495	40,059	23,779	6,993	81,326
TBT	39	217	160	142	558
Pre-shipment	277	0	0	0	277
Quantity control	24	111	972	60	1,167
Price control	137	132	64	52	385
Export-related	215	281	409	122	1,027
Total	11,187	40,800	25,384	7,369	84,740

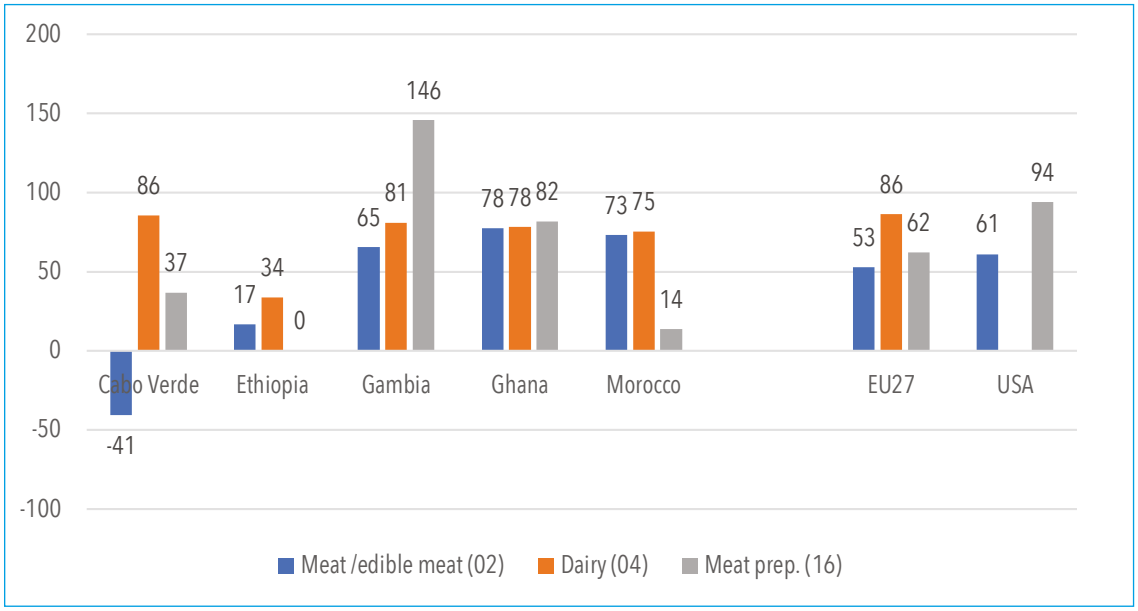
Source: Data from UNCTAD 2017.

Figure 4.40 Ad valorem equivalent of SPS measures (%)



Source: Based on Nguyen, Bouët, and Traoré (2020) estimations.

Figure 4.41 Ad valorem equivalent of TBT measures (%)



Source: Based on Nguyen, Bouët, and Traoré (2020) estimations.

One of the most important NTMs in the agriculture sector is domestic support. Table 4.5 shows the domestic support provided for livestock and dairy in the EU and US. Three observations merit mention. First, the total amount of domestic support is higher in the EU than in the US. Second, dairy products (skimmed milk) and some livestock products benefit from domestic support that exceeds the *de minimis*[10] threshold, which makes these products more protected than others. Third, most of the domestic support provided by the US and EU is allocated in the WTO "green box." In theory, these amounts must not distort trade or involve price support and must be government funded (WTO website). Yet, even though this support does not target specific products, it may have an indirect negative effect on African exports, since it makes US and EU producers more competitive.

10 Under WTO provisions, the *de minimis* threshold refers to the allowable level of domestic support spending — measured as a percent of the total value of production of a certain agricultural product — below which there is no requirement for reduction of support; for developed countries the threshold is 5 percent, and for developing countries it is 10 percent.

Table 4.5 Domestic support in the US and EU

United States					European Union				
Product	Product specific AMS	Value of production (US$ millions)	Support as a % of value of production	Regime	Product	Product specific AMS	Value of production (US$ millions)	Support as a % of value of production	Regime
Meat									
Meat cattle and calves	61.7	50398.4	0.12%	de minimis	Meat	51.2	39641.3	0.13%	de minimis
Bison	0.3	120.2	0.26%	de minimis	Pig meat	40.5	46181.8	0.09%	de minimis
Goats	0.8	163.6	0.47%	de minimis	Sheep	59.0	6771.2	0.87%	de minimis
Hogs and pigs	0.5	19159.2	0.00%	de minimis	Other livestock	75.2	n.a.	-	75.2
Sheep and lambs	2.3	711.9	0.33%	de minimis					
Poultry	1.5	42781.7	0.00%	de minimis					
Dairy									
Dairy	0.3	38119.3	0.00%	de minimis	Milk	248.26	70106.31	0.35%	de minimis
					Skimmed milk	1829.62	n.a.	-	1829.617
Period	Sept. 1, 2017 to August 31, 2018				July 1, 2017 to June 30, 2018				
Current total AMS	4,248.7				8,180.3				
Non-product-specific AMS	3,442.4				1,256.8				
Total AMS commitment level	19,103.3				85,401.8				
Green box	118,185				77,694.2				

Source: Constructed using WTO dataset.
Note: Figures are in US$ million. Figures for EU have been converted using US$1= 0.8475 Euros. AMS = total aggregate measurement of support.

RISKS TO AFRICAN LIVESTOCK SUPPLY CHAINS

In addition to the challenges of a competitive global market, distortionary domestic support programs, and tariff and nontariff barriers to trade, African livestock production faces risks from a changing climate and from conflict. Climate change and conflict are the primary threats to food security in Africa, and they have a critical impact on livestock production.

Climate risks

Climate change threatens livestock production through numerous pathways. Higher temperatures can cause heat stress in animals, leading to reduced productivity and reproduction efficiency, and in some cases, death. Heat stress typically reduces animal feed intake and weight gain and increases animal water intake. Dairy cows and laying hens are particularly sensitive to heat stress (Kadzere et al. 2002; Nardone 2010). Though the economic impact in Africa may be difficult to assess, even relatively temperate countries already experience substantial economic losses; the US, for example, loses between $1.7 and $2.7 billion annually due to heat stress (St-Pierre et al. 2003). While indigenous livestock breeds in Africa typically have high heat-stress tolerance, research has shown that the frequency of severe heat events has increased over the past decade, and some livestock production occurs in regions where dangerous heat events will jeopardize production. Rahimi et al. (2021) estimate that 11–15 percent of milk production in eastern Africa occurs in regions that will experience moderate or severe heat stress that cripples production, and milk production per cow will decrease by up to 35 percent.

Some adaptation strategies can help reduce risk, such as agroforestry or built shelters to provide shade, but this adaptation will require capital investment, extension training, and/or strong farmer-to-farmer education. Breeding and genetic selection strategies offer some promise of increasing resilience, but face trade-offs: animals bred for higher productivity in intensive production systems typically have lower heat tolerance (Lukuyu 2009). Some regions may prioritize more resilient animals, such as goats and sheep, that demonstrate higher temperature-humidity resilience than dairy cows, cattle, poultry, and swine. Already, several regions have begun prioritizing more resilient animals, as evident in the large share of live goat, camel, and sheep exports from Africa.

In addition to heat events, reduced quantity and quality of forage or feeds (IFAD 2010), reduced water availability, and increases in livestock diseases related to climate change will heighten risks to livestock production. Changes in precipitation and temperature affect the spread of vector-borne pests and diseases affecting livestock, and create greater risk for people, particularly those in close contact with livestock, as climate change exacerbates the risk of zoonotic pathogens and zoonoses (Godde et al. 2021).

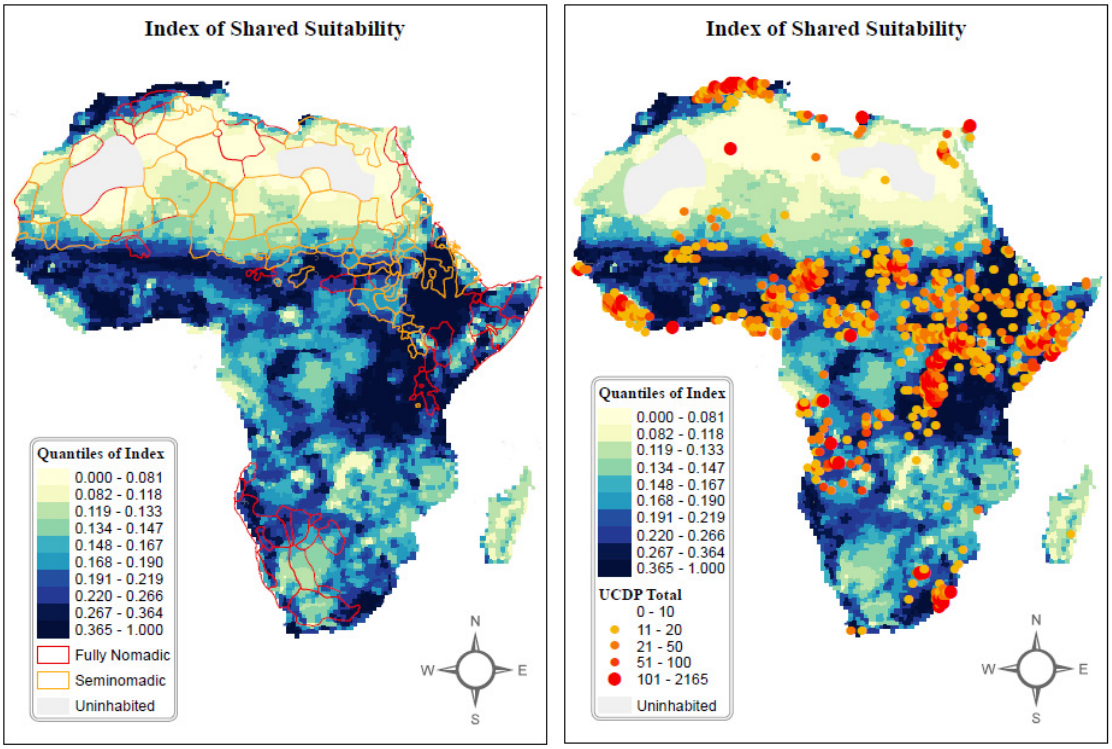
Beyond livestock production, higher temperatures, increased humidity, and increased frequency of extreme weather events put additional stress on animals during transportation and worsen conditions for storage and distribution, increasing risks to food quality, safety, and shelf-life that will put Africa at an added disadvantage in livestock processing. Extreme climate events and variability may also disrupt regular trade patterns or damage essential transportation infrastructure (Godde et al. 2020).

As climate change marginalizes more African cropland, arid and semi-arid regions now used for crops may be shifted to grazing, since grass yields may be less affected than crop yields (Jones and Thornton 2009). At the same time, the world must grapple with minimizing global greenhouse gas (GHG) emissions, one-third of which come from food systems, including emissions from livestock production that account for 14.5 percent of total global anthropogenic emissions (Gerber 2013).

Conflict

Extreme weather events, aridity, and desertification have decreased grazing land, heightening land competition in some regions. Weak government regulation of pastoralism and poor land management have further aggravated land-related tensions. The African Union estimates that 270 million African pastoralists compete for land and water with crop production, mining, and other interests (AU 2013). Regions in the Sahel and East Africa especially have experienced extreme farmer–herder conflicts. Research shows a direct correlation between drought in pastoral areas and conflict in neighboring agricultural areas; this suggests that displacement of pastoral groups caused by low precipitation in their home region leads to agro-pastoral conflict (McGuirk and Nunn 2020). In addition, the number of regions that have experienced conflict events roughly doubled from 1989 to 2018, while the number of months of regional drought recorded annually has risen sharply. Figure 4.42 explores the relationship between conflict events and regions well-suited to both nomadic/seminomadic pastoralism and agriculture. The conflict zones overlap with many top livestock production regions.

Figure 4.42 Shared suitability for pastoralism and agriculture, with number of conflict events, 1989–2018



Source: Reprinted with permission from McGuirk and Nunn 2020.

Note: Spatial distribution of "shared suitability" is equal to 1 if land is perfectly suited to both agriculture and pastoralism, and zero if it is not suited to either. Righthand map includes violent conflict events in each cell from 1989–2018, as measured by Uppsala Conflict Data Program (UCDP); it includes two-sided battles and one-sided attacks that produce at least one fatality.

CONCLUSION

This chapter examined the defensive trade interests of African economies in meat and live animals, dairy, and poultry value chains. The African continent is a net global importer of all three product groups. Our findings suggest a large heterogeneity among African countries in terms of the performance in these value chains. Moreover, informal trade is an important component that must be taken into consideration when studying the livestock sector in Africa.

In terms of trade policy, NTMs are particularly cumbersome for meat, dairy, and poultry. Some sanitary regulations are prohibitory for African producers and processors, especially those with limited capital to ensure pasteurization or other processing or storage for improved food safety and shelf-life. Many governments, including the EU countries and US, provide high levels of domestic support for dairy and other livestock producers. For African products to become more competitive, they must address these trade barriers and raise their country-level agricultural investment in order to match the high productive capacity and coordination of global competitors. Government investment in livestock value chains could make Africa more regionally competitive and would align with the African Union's Malabo Declaration goal of investing 10 percent of national public expenditures in support for the agriculture and service sectors (AU 2014). Governments could work to reach this goal by investing in sanitary measures and pasteurization equipment, making these accessible for smallholder farmers, as well as improving access to markets, infrastructure, extension services, and farmer-to-farmer education strategies. Finally, foreign direct investment in the agriculture sector might also help improve the competitiveness of African countries. Indeed, such investments might help boost mechanization and increase technical and managerial spillover (Husmann and Kubik 2019; Pingali 2007).

While strengthening livestock value chains has promising economic potential, the sector must contend with the associated risks of climate change and conflict, as well as livestock's high GHG emissions compared with other food products. Africa must simultaneously embrace and seek investment for lower GHG production methodologies, invest in climate adaptation, and take strong government regulatory action to prevent resource conflicts over land and water. In addition, equity in the growth of African livestock value chains is a major concern, both for producers and surrounding affected communities, and for African consumers and environmental equity. As African demand for livestock products increases, policymakers should bear in mind not only the human health benefits of small amounts of animal-source foods for dietary health, but also their diminishing returns as the proportion and quantity of animal-source food increases within a complete diet. A small amount of animal-source foods offers substantial nutritional benefits for a healthy and productive life; high consumption often puts consumers at risk of chronic disease, and also contributes to pushing our environment beyond its planetary boundaries (Springmann et al. 2018; Willet et al. 2019).

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APPENDIX

Table A4.1 List of HS codes by value chain

Code	Description
Meat	
Live animals	
Horses, mules and hinnies, asses	
10121	Horses; live, pure-bred breeding animals
10129	Horses; live, other than pure-bred breeding animals
10130	Asses; live
10190	Mules and hinnies; live
Cattle, buffalo, other bovines	
10221	Cattle; live, pure-bred breeding animals
10229	Cattle; live, other than pure-bred breeding animals
10231	Buffalo; live, pure-bred breeding animals
10239	Buffalo; live, other than pure-bred breeding animals
10290	Bovine animals; live, other than cattle and buffalo (i.e. bulls)
Swine	
10310	Swine; live, pure-bred breeding animals
10391	Swine; live, other than pure-bred breeding animals, weighing less than 50kg
10392	Swine; live, other than pure-bred breeding animals, weighing 50kg or more
Sheep	
10410	Sheep; live
Goats	
10420	Goats; live
Camel	
10613	Camels and other camelids
Meat carcasses and cuts	
Bovine meat carcasses and cuts	
20110	Meat; of bovine animals, carcasses and half-carcasses, fresh or chilled
20120	Meat; of bovine animals, cuts with bone in (excluding carcasses and half-carcasses), fresh or chilled
20130	Meat; of bovine animals, boneless cuts, fresh or chilled
20210	Meat; of bovine animals, carcasses and half-carcasses, frozen
20220	Meat; of bovine animals, cuts with bone in (excluding carcasses and half-carcasses), frozen
20230	Meat; of bovine animals, boneless cuts, frozen
Other meat carcasses and cuts	
20311	Meat; of swine, carcasses and half-carcasses, fresh or chilled
20312	Meat; of swine, hams, shoulders and cuts thereof, with bone in, fresh or chilled
20319	Meat; of swine, n.e.c. in item no. 0203.1, fresh or chilled
20321	Meat; of swine, carcasses and half-carcasses, frozen
20322	Meat; of swine, hams, shoulders and cuts thereof, with bone in, frozen

20329	Meat; of swine, n.e.c. in item no. 0203.2, frozen
20410	Meat; of sheep, lamb carcasses and half-carcasses, fresh or chilled
20421	Meat; of sheep, carcasses and half-carcasses (excluding carcasses and half-carcasses of lamb), fresh or chilled
20422	Meat; of sheep (including lamb), cuts with bone in (excluding carcasses and half-carcasses), fresh or chilled
20423	Meat; of sheep (including lamb), boneless cuts, fresh or chilled
20430	Meat; of sheep, lamb carcasses and half-carcasses, frozen
20441	Meat; of sheep, carcasses and half-carcasses (excluding carcasses and half-carcasses of lamb), frozen
20442	Meat; of sheep (including lamb), cuts with bone in (excluding carcasses and half-carcasses), frozen
20443	Meat; of sheep (including lamb), boneless cuts, frozen
20450	Meat; of goats, fresh, chilled or frozen
20500	Meat; of horses, asses, mules or hinnies, fresh, chilled or frozen
Offal, salted or prepared meats	
20610	Offal, edible; of bovine animals, fresh or chilled
20621	Offal, edible; of bovine animals, tongues, frozen
20622	Offal, edible; of bovine animals, livers, frozen
20629	Offal, edible; of bovine animals, (other than tongues and livers), frozen
20630	Offal, edible; of swine, fresh or chilled
20641	Offal, edible; of swine, livers, frozen
20649	Offal, edible; of swine, (other than livers), frozen
20680	Offal, edible; of sheep, goats, horses, asses, mules or hinnies, fresh or chilled
20690	Offal, edible; of sheep, goats, horses, asses, mules or hinnies, frozen
20860	Meat and edible meat offal; of camels and other camelids (Camelidae), fresh, chilled or frozen
20890	Meat and edible meat offal; n.e.c. in chapter 2, fresh, chilled or frozen
20910	Fat; pig fat, free of lean meat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked
20990	Fat; poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked
21011	Meat; salted, in brine, dried or smoked, of swine, hams, shoulders and cuts thereof, with bone in
21012	Meat; salted, in brine, dried or smoked, of swine, bellies (streaky) and cuts thereof
21019	Meat; salted in brine, dried or smoked, of swine, n.e.c. in item no. 0210.1
21020	Meat; salted, in brine, dried or smoked, of bovine animals
21091	Meat and edible meat offal; salted, in brine, dried or smoked, and edible flours and meals of meat or meat offal, of primates
21092	Meat and edible meat offal; salted, in brine, dried or smoked; edible flours, meals of meat or meat offal, of whales, dolphins, porpoises (of order Cetacea); manatees, dugongs (of order Sirenia); seals, sea lions, and walruses (of suborder Pinnipedia)
21093	Meat and edible meat offal; salted, in brine, dried or smoked, and edible flours and meals of meat or meat offal, of reptiles (including snakes and turtles)
21099	Meat and edible meat offal; salted, in brine, dried or smoked, and edible flours and meals of meat or meat offal, other than of primates, whales, dolphins, porpoises, manatees, dugongs, seals, sea lions, walruses, reptiles (including snakes and turtles)

160100	Meat preparations; sausages and similar products, of meat, meat offal or blood, and food preparations based on these products
160210	Meat preparations; homogenised preparations of meat, meat offal or blood
160220	Meat preparations; of the prepared or preserved liver of any animal (excluding homogenised preparations)
160241	Meat preparations; of swine, hams and cuts thereof, prepared or preserved (excluding homogenised preparations)
160242	Meat preparations; of swine, shoulders and cuts thereof, prepared or preserved (excluding homogenised preparations)
160249	Meat preparations; of swine, meat or meat offal (including mixtures), prepared or preserved, n.e.c. in heading no. 1602
160250	Meat preparations; of bovine animals, meat or meat offal, prepared or preserved (excluding livers and homogenised preparations)
160290	Meat preparations; of meat, meat offal or the blood of any animal, n.e.c. in heading no. 1602

Hides and skins

410120	Whole hides and skins, not exceeding 8kg when simply dried, 10 kg. when dry-salted, or 16 kg. when fresh, wet-salted or otherwise preserved
410150	Whole hides and skins, of a weight exceeding 16 kg.
410190	Raw hides, others, including butts, bends and bellies

Poultry

Live poultry

10511	Poultry; live, fowls of the species Gallus domesticus, weighing not more than 185g
10512	Poultry; live, turkeys, weighing not more than 185g
10513	Poultry; live, ducks, weighing not more than 185g
10514	Poultry; live, geese, weighing not more than 185g
10515	Poultry; live, guinea fowls, weighing not more than 185g
10594	Poultry; live, fowls of the species Gallus domesticus, weighing more than 185g
10599	Poultry; live, ducks, geese, turkeys and guinea fowls, weighing more than 185g

Poultry, whole

20711	Fowls of the species Gallus domesticus, not cut in pieces, fresh or chilled
20712	Fowls of the species Gallus domesticus, not cut in pieces, frozen
20724	Turkeys, not cut in pieces, fresh or chilled
20725	Turkeys, not cut in pieces, frozen
20741	Ducks, not cut in pieces, fresh or chilled
20742	Ducks, not cut in pieces, frozen
20751	Geese, not cut in pieces, fresh or chilled
20752	Geese, not cut in pieces, frozen
20760	Guinea fowls, fresh, chilled or frozen

Poultry meat cuts, edible offal and preparations	
20713	Fowls of the species Gallus domesticus, cuts and offal, fresh or chilled
20714	Fowls of the species Gallus domesticus, cuts and offal, frozen
20726	Turkeys, cuts and offal, fresh or chilled
20727	Turkeys, cuts and offal, frozen
20743	Ducks, fatty livers (foie gras), fresh or chilled
20744	Ducks, cuts and offal, excluding fatty livers, fresh or chilled
20745	Ducks, cuts and offal, excluding fatty livers, frozen
20753	Geese, fatty livers (foie gras), fresh or chilled
20754	Geese, cuts and offal, excluding fatty livers, fresh or chilled
20755	Geese, cuts and offal, excluding fatty livers, frozen
160231	Meat preparations; of turkeys, prepared or preserved meat or meat offal (excluding livers and homogenised preparations)
160232	Meat preparations; of the poultry of heading no. 0105, (i.e. of fowls of the species Gallus domesticus)
160239	Meat preparations; of poultry (excluding turkeys), prepared or preserved meat or meat offal (excluding livers and homogenised preparations)

Dairy

Fluid milk and cream	
40110	Dairy produce; milk and cream, not concentrated, not containing added sugar or other sweetening matter, of a fat content, by weight, not exceeding 1%
40120	Dairy produce; milk and cream, not concentrated, not containing added sugar or other sweetening matter, of a fat content, by weight, exceeding 1% but not exceeding 6%
40140	Dairy produce; milk and cream, not concentrated, not containing added sugar or other sweetening matter, of a fat content, by weight, exceeding 6% but not exceeding 10%
40150	Dairy produce; milk and cream, not concentrated, not containing added sugar or other sweetening matter, of a fat content, by weight, exceeding 10%

Processed dairy	
Dry milk and cream (including for baby formulas)	
40210	Dairy produce; milk and cream, concentrated or containing added sugar or other sweetening matter, in powder, granules or other solid forms, of a fat content not exceeding 1.5% (by weight)
40221	Dairy produce; milk and cream, concentrated, not containing added sugar or other sweetening matter, in powder, granules or other solid forms, of a fat content exceeding 1.5% (by weight)
40229	Dairy produce; milk and cream, containing added sugar or other sweetening matter, in powder, granules or other solid forms, of a fat content exceeding 1.5% (by weight)

Concentrated, whey, fats, constituents	
40291	Dairy produce; milk and cream, concentrated, not containing added sugar or other sweetening matter, other than in powder, granules or other solid forms
40299	Dairy produce; milk and cream, containing added sugar or other sweetening matter, other than in powder, granules or other solid forms
40520	Dairy produce; dairy spreads
40590	Dairy produce; fats and oils derived from milk (other than butter or dairy spreads)
40410	Dairy produce; whey, whether or not concentrated or containing added sugar or other sweetening matter
40490	Dairy produce; natural milk constituents (excluding whey), whether or not containing added sugar or other sweetening matter, n.e.c. in chapter 04
40510	Dairy produce; derived from milk, butter
Cheese	
40610	Dairy produce; fresh cheese (including whey cheese), not fermented, and curd
40620	Dairy produce; cheese of all kinds, grated or powdered
40630	Dairy produce; cheese, processed (not grated or powdered)
40640	Dairy produce; cheese, blue-veined and other cheese containing veins produced by Penicillium roqueforti (not grated, powdered or processed)
40690	Dairy produce; cheese (not grated, powdered or processed), n.e.c. in heading no. 0406
Cultured	
40310	Dairy produce; yoghurt, whether or not concentrated or containing added sugar or other sweetening matter or flavoured or containing added fruit or cocoa
40390	Dairy produce; buttermilk, curdled milk or cream, kefir, fermented or acidified milk or cream, whether or not concentrated or containing added sweetening, flavouring, fruit or cocoa (excluding yoghurt)

Table A4.2 Tariffs imposed by main agriculture producers, 2016 (%)

		Africa	Brazil	China	EU27	India	USA	World
Dairy	Fluid milk and cream	20.3	12.6	11.3	42.9	25.3	10.6	43.9
	Cheese	12.9	18.3	10.5	12.7	29.6	19.8	26.2
	Conc., whey, fats, constituents	13.0	18.8	5.9	31.8	31.3	22.8	33.0
	Cultured	22.3	14.8	13.8	41.2	16.8	39.3	44.4
	Dry milk and cream	17.2	22.0	6.4	47.8	58.1	14.5	29.2
Meat	Hides and skins	3.4	2.0	5.5	0.0	0.0	2.1	2.7
	Camel	5.3	3.9	0.4	0.0	0.5	0.0	3.0
	Cattle, buffalo, other bovines	20.4	1.0	6.1	15.0	17.7	0.1	7.8
	Goats	5.3	1.0	5.0	0.7	9.7	0.3	4.2
	Horses, mules and hinnies, asses	4.1	1.4	6.1	3.2	24.7	0.0	1.3
	Sheep	8.3	0.7	5.2	0.0	0.2	0.0	3.8
	Swine	10.1	1.5	6.1	12.0	3.5	0.0	8.0
	Bovine meat carcasses/cuts	33.8	9.0	11.0	15.1	26.5	4.6	17.6
	Other meat carcasses and cuts	21.0	9.6	10.7	8.4	28.9	0.2	13.0
	Offal, salted or prep. meats	22.6	10.6	13.9	22.8	35.4	1.3	16.0
Poultry	Live poultry	5.8	1.4	5.1	11.3	27.6	1.4	10.5
	Poultry meat cuts, edible offal	26.5	9.6	7.4	41.4	95.3	5.9	29.1
	Poultry, whole	28.3	8.6	11.2	18.1	29.5	4.2	32.9

Source: Constructed using MAcMap-HS6.

THE IMPACT OF COVID-19 ON AGRICULTURAL TRADE, ECONOMIC ACTIVITY, AND POVERTY IN AFRICA

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Chapter 5

INTRODUCTION

In Africa, after the first coronavirus case was reported in Egypt in mid-February 2020, the number of victims rose rapidly. Fifteen months later, 6.2 million cases had been identified and 157,224 deaths reported. Though alarming, these numbers are low compared with Asia (58.8 million cases and 837,964 deaths), Europe (50 million cases and 1.12 million deaths), and North America (40.4 million cases and 912,299 deaths).[1] Within Africa, the Seychelles, Cabo Verde, and Tunisia have been most affected in terms of cumulative cases per million people; in terms of deaths per million people, Tunisia, South Africa, and Namibia have been hardest hit.

Initially the health crisis raised serious concerns for Africa, given the continent's weak medical infrastructure and the prevalence of tuberculosis and immunodeficiency diseases.[2] But now, it appears that Africa has been less affected than other continents. Figure 5.1 shows the relation (in logarithm) between GDP per capita (corrected for differences in purchasing power) and the cumulative deaths per million people at the end of February 2021.[3] If the incidence of COVID-19 deaths is related to the quality of medical infrastructure, higher GDP per capita would be expected to lead to lower cumulative death rates and vice versa. However, Figure 5.1 does not confirm this hypothesis and African countries, represented by orange dots, are mainly located on the bottom left of the graph, meaning that they have been relatively less affected by the pandemic despite low GDP. There are several plausible explanations for this.[4]

First, African governments took appropriate health measures quickly (promoting frequent handwashing, compulsory wearing of masks, social distancing, and school closures), and people largely adhered to these measures.[5] Africans are unfortunately familiar with epidemics.

Second, a relatively large share of Africa's population lives in rural areas, where population dispersion may reduce disease transmission: according to the World Bank, 59 percent of the African population lives in rural areas, compared with 44 percent worldwide.[6]

Third, the population is young, which largely explains the region's relatively low morbidity numbers. According to the United Nations Population Division, in 2020, young people (between 0 and 19 years old) represented 50.7 percent of the total population in Africa, compared with 33.3 percent globally.[7]

Fourth, Sajadi et al. (2020) have suggested, based on a study of 80 cities with high variability in virus prevalence and climatic conditions, that low temperature and low humidity favor transmission of the virus, whereas many African countries are relatively hot and humid.[8]

1 All these data are from Our World in Data and World Development Indicators, accessed February 23, 2021.

2 British Columbia's Centre for Disease Control states that tuberculosis "is not known to put people at higher risk of COVID-19 infection, but it may put you at risk of having more severe symptoms." http://www.bccdc.ca/health-info/diseases-conditions/covid-19/priority-populations/tuberculosis-and-covid-19, accessed June 29, 2020.

3 The same relation, also in logarithm, between GDP per capita (corrected for differences in purchasing power) and the number of cumulative cases per million people holds.

4 See Soy (2020) and *Economist* (2020).

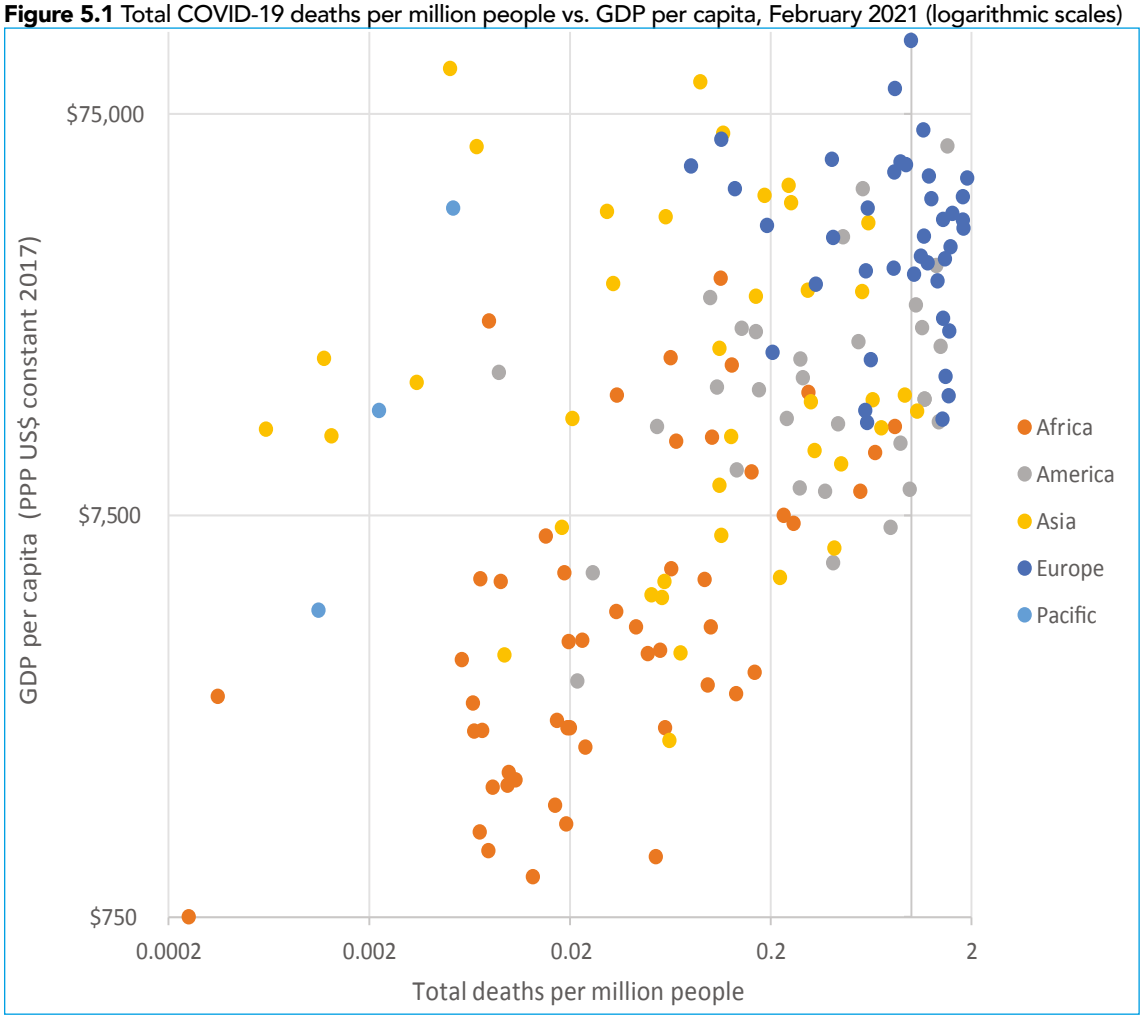
5 See the main conclusions of a survey conducted by the Partnership for Evidence-Based Response to COVID-19 (PERC) from March 29–April 17, 2020, in 28 cities across 20 African member states. https://reliefweb.int/report/world/responding-covid-19-africa-using-data-find-balance; accessed March 18, 2021.

6 https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS; accessed May 11, 2021.

7 Department of Economic and Social Affairs, https://population.un.org/wpp/Download/Standard/Population/; accessed March 18, 2021.

8 The Sajadi et al. (2020) results are confirmed by Mecenas et al. (2020), who conclude that, "Considering the existing scientific evidence, warm and wet climates seem to reduce the spread of COVID-19." In Africa, the climate is on average hotter and more humid than in the 30°N to 50°N corridor, which includes Tokyo in Japan, Qom in Iran, Milan in Italy, Paris in France, Seattle in the US, and other cities characterized by substantial community transmission, even if in Africa, the range of mean temperature and humidity is large.

Figure 5.1 Total COVID-19 deaths per million people vs. GDP per capita, February 2021 (logarithmic scales)



Source: Constructed using data from Our World in Data and World Development Indicators.

But beyond the health crisis, a major economic crisis has increased food insecurity and poverty on the continent. The measures adopted to fight the pandemic and the resulting economic consequences have deeply affected all countries around the world, and Africa has suffered along with all other regions.

This crisis is macroeconomic, reflecting the global downturn and worsening of African current accounts, but its sectoral impact is heterogeneous: the fuel and energy sector and tourism have been severely affected as demand dropped. Demand for agricultural goods has been more stable because these are largely necessity goods (with an income-elasticity of less than one). However, the rise of trading costs and measures adopted at country borders have significantly impeded intra-African agricultural trade during the pandemic.

To understand the impact of this crisis, we combine a macroeconomic analysis that explains the current account balance of the African continent with a value chain approach that considers African specificities. Africa is an importer of essential food products from the rest of the world, and has a comparative advantage in a few traditional cash crops and in niche products (cashew nuts, kola nuts, vanilla, sesamum seeds, locust beans, and others) exported to the rest of the world under specific transport conditions. In intra-African agricultural trade, informal trade plays an important role, and trade is growing in semiprocessed and processed products. Economic modeling allows for a decomposition of the various forces at work during this crisis and an assessment of the consequences for poverty and food security on the continent.

This chapter reviews efforts to estimate the impact of the COVID-19 pandemic on agricultural trade, economic activity, and poverty in Africa, in view of the critical role that agricultural trade plays for millions of poor people. The next section presents the policy responses to the pandemic. The following one introduces the channels through which the pandemic affected African agricultural trade. Then the penultimate section assesses the impact of the crisis. The final section concludes.

POLICY RESPONSES

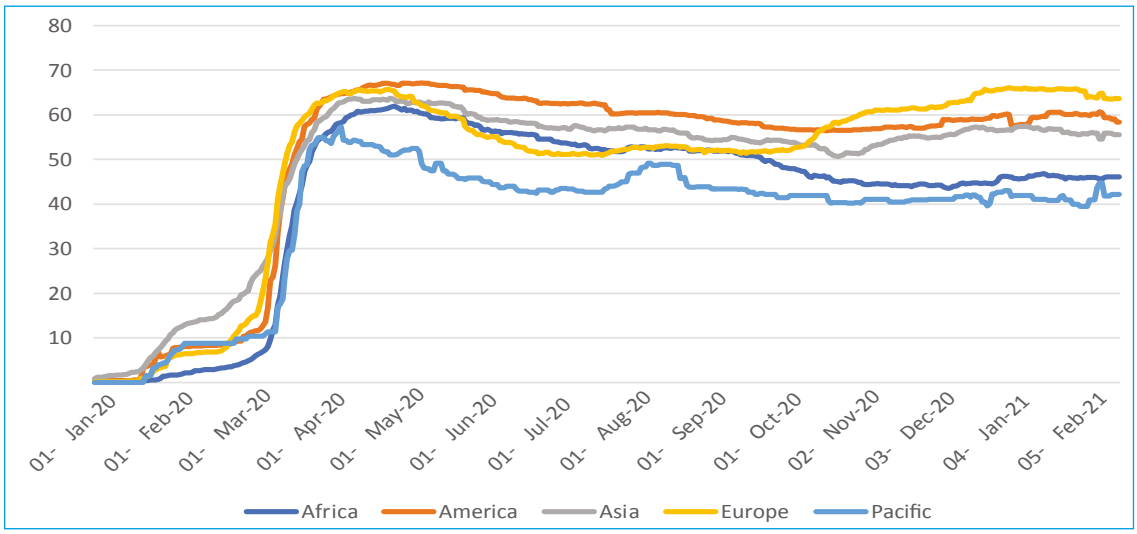
The measures taken to contain the pandemic's spread largely caused the current economic crisis. We first present the overall policy response; then we focus on the border-related responses that most affected agricultural trade.

Overall policy responses

Around the world, governments have responded to the pandemic with two types of policies: health measures to contain the spread of the virus, and economic measures to support households and economic activity. The first set includes containment measures (closing schools, workplaces, and marketplaces, canceling public events, confinement or "lockdowns" at home) as well as health measures (public information, testing, contact tracing, facial coverings, vaccinations). The second set includes income support and transfers, debt, contract, and tax relief for households and businesses, fiscal measures, trade facilitation, and others.[9]

The Oxford COVID-19 Government Response Tracker (OxCGRT) has collected data on measures taken by 185 governments and designed a Government Response Index, which includes health, sanitary, and economic measures (a simple average of scores by continent is presented in Figure 5.2); and also a Containment and Health Index with only health and sanitary measures (Figure 5.3) and an Economic Support Index with only economic measures (Figure 5.4).[10] Each index is normalized in a 0 to 100 range, with a higher index indicating more policy measures. These indexes do not include any quality judgement on the effectiveness or appropriateness of these measures, as its creators note.

Figure 5.2 Average of COVID-19 Government Response Index by continent

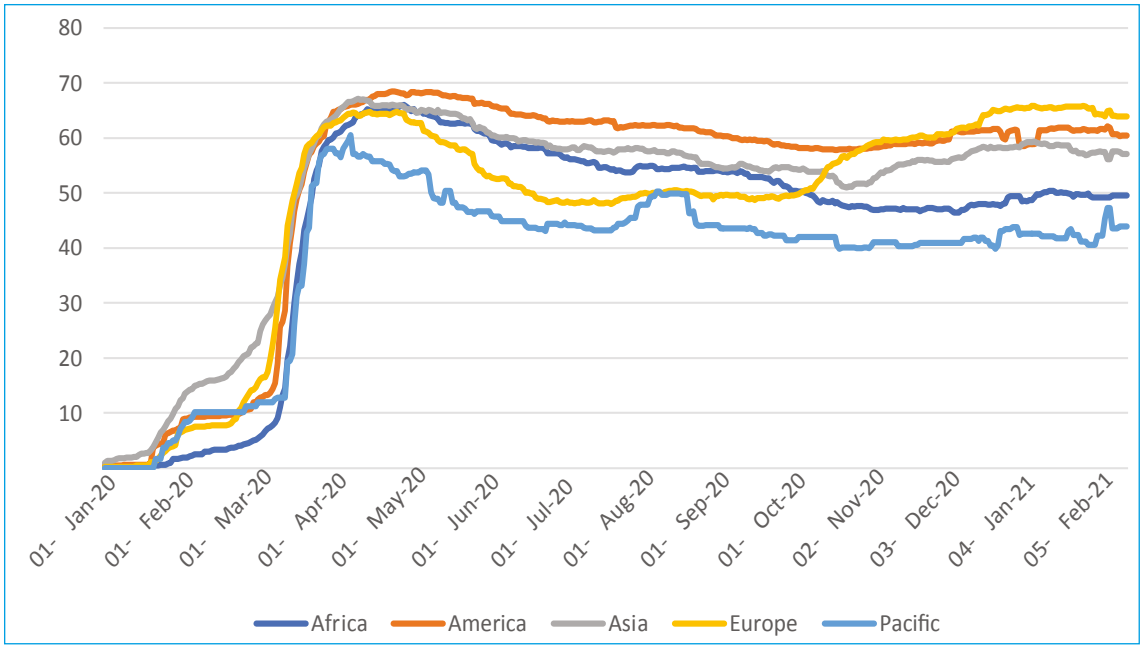


Source: Data from Oxford COVID-19 Government Response Tracker (OxCGRT).
Note: This index measures the number of adopted policies, including measures for economic support and for health; the graph presents simple averages by continent of countries' indexes.

9 See Agyei-Holmes et al. 2021; Hale et al. 2020a; Hale et al. 2020b; Laborde, Mamun, and Parent 2020; Laborde, Martin, and Vos 2020.

10 See Hale et al. 2020a for the methodology and Hale et al. 2020b for the dataset. The first index includes the second and the third one.

Figure 5.3 Average of COVID-19 Containment and Health Index by continent



Source: Data from Oxford COVID-19 Government Response Tracker (OxCGRT).
Note: This index measures the number of health and sanitary policy measures; the graph presents simple averages by continent of countries' indexes.

What is striking for African countries is that their response has been in line with other continents, particularly the wealthy countries (Europe), not only in terms of the intensity of the policy response, but also in terms of timing. African countries reacted quickly and adopted numerous health measures, even ahead of Europe. However, they adopted economic support measures slightly later than other continents, and these measures are generally weaker (Agyei-Holmes et al. 2021).

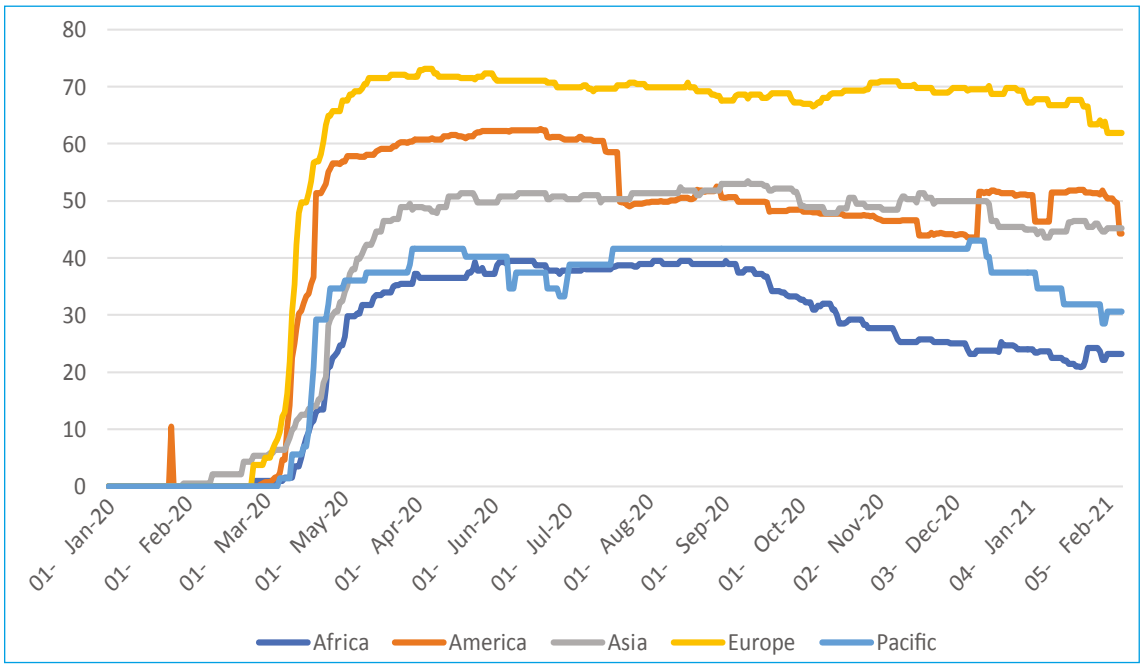
Among African countries, Rwanda has the highest Government Response Index on average over the whole period and has adopted the most health and sanitary measures, whereas Gabon is first in terms of economic support measures.[11]

Interestingly, according to the IMF, "Togo was one of the first African countries to respond to the crisis, developing and quickly implementing the most urgent components of a comprehensive, multi-year response plan that aims to protect lives, livelihoods, and future growth prospects."[12] Togo launched a cash-transfer program using mobile phones in April 2020, with eligible applicants (informal workers), 65 percent of whom are women, receiving a state grant equal to 30 percent of the minimum wage.

11 For all these rankings, we averaged daily indexes from March 1, 2020, to February 24, 2021.

12 IMF, https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#T; accessed February 24, 2021.

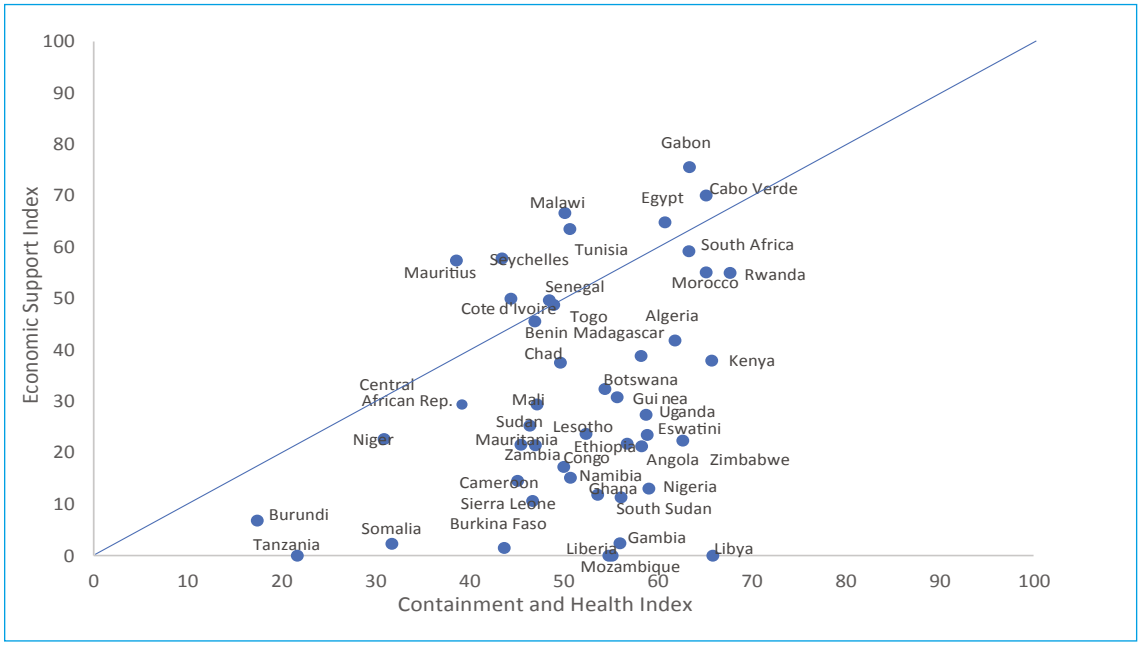
Figure 5.4 Average of COVID-19 Economic Support Index by continent



Source: Oxford COVID-19 Government Response Tracker (OxCGRT).
Note: This index measures the number of economic support policy measures adopted; the graph presents simple averages by continent of countries' indexes.

Figure 5.5 shows African countries, with the Containment and Health Index on the x-axis and the Economic Support Index on the y-axis for comparison. As above, these are the OxCGRT scores, but they are averaged over the period from March 1, 2020, to February 24, 2021. Most African countries adopted more health measures than economic support measures, likely because of limited budgetary resources. Only a few countries (Cabo Verde, Côte d'Ivoire, Egypt, Gabon, Malawi, Mauritius, Seychelles, and Tunisia) have adopted many economic support measures.

Figure 5.5 Comparison of African countries in terms of Containment and Health Index and Economic Support Index, average from March 1, 2020, to February 24, 2021



Source: Constructed from Oxford COVID-19 Government Response Tracker (OxCGRT).

Focus on at-the-border policies

Most African countries closed land borders to travelers; freight was still allowed to pass, though under tighter controls and, in some cases, only allowing agricultural and food products through. Between March 13 and March 24, 2020, 25 African countries imposed such restrictions on land borders (Figure 5.6). Almost all these countries also suspended the arrival of international flights, at least from countries particularly affected by the virus. And many governments imposed curfews.

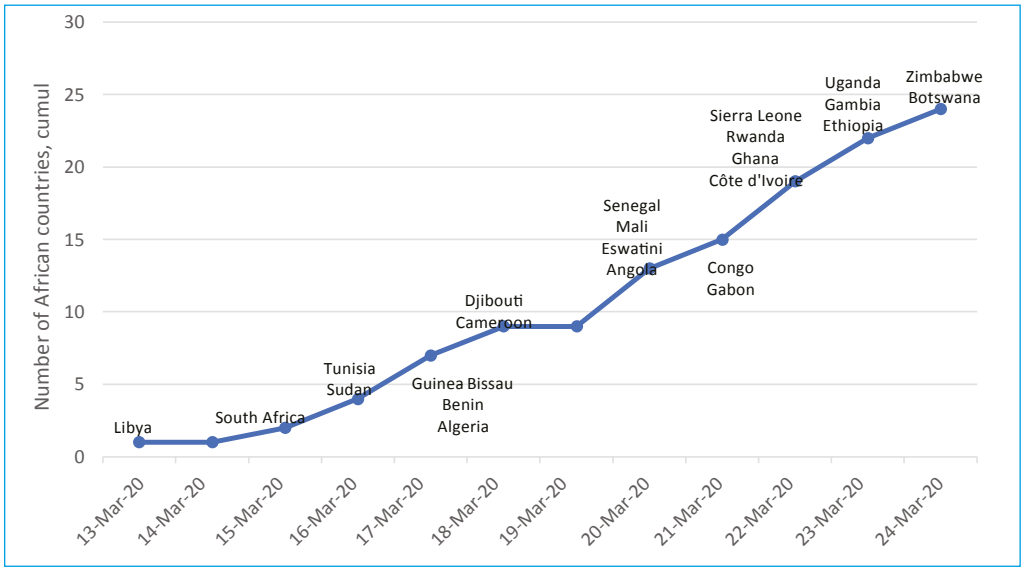
The Democratic Republic of Congo (DRC), Kenya, Liberia, and Namibia chose a different path. In these countries, people crossing at border posts are subject to temperature checks and COVID-19 testing followed, if necessary, by hospitalization and/or quarantine.

All these measures were adopted to protect public health, but their economic consequences have been significant. Stricter sanitary border controls usually increase trading costs (Bao, Bouët, and Traoré 2020), and as we will show in this chapter, intra-African trade of agricultural products has slowed.

In addition, prohibiting people from crossing the border impedes or even stops the informal trade of small quantities by individuals, a common practice in Africa and often the main source of income for a family. This type of trade accounts for a significant share of recorded trade: for example, Uganda's informal exports are equal to 15 to 25 percent of its official exports of goods to its five neighboring countries (DRC, Kenya, Rwanda, South Sudan, and Tanzania), with individual traders accounting for most of these flows.

Some border closures were imposed with little knowledge of what is happening on the ground. For example, in West Africa, perishable products are usually transported at night to avoid daytime heat. Yet curfews make this practice impossible. Mandating more thorough health checks without adding necessary personnel also increases transport times. As a result, health checks and curfews have caused significant waste and loss of products in West Africa, according to an interview with Brahima Cissé, a trade analyst with the Comité Interétatique de Lutte contre la Sècheresse au Sahel (CILSS, Permanent Interstate Committee for Drought Control in the Sahel).[13]

Figure 5.6 Closure of land borders in Africa, March 2020



Source: Data from websites of US embassies in Africa and from al Jazeera (2020).

13 Personal communication, January 21, 2021.

Border restrictions on travel can be particularly costly for livestock producers practicing transhumance — that is, seasonally moving livestock between grazing grounds — as occurs between Sahelian countries, including Burkina Faso and Mali, and coastal countries, such as Benin and Côte d'Ivoire, and between Kenya and Uganda.

In addition, exceptional measures, such as stricter sanitary controls, can create a breeding ground for the abuse of power. In many parts of Africa, it is common practice for law enforcement officials to set up checkpoints along trade corridors in order to collect bribes. As sanitary measures augmented the reasons for setting up checkpoints, bribe collection increased notably during the first quarter of 2020 along three corridors in West Africa: Abidjan (Côte d'Ivoire)–Lagos (Nigeria), Kano (Nigeria)–Zinder (Niger), and Bama (Burkina Faso)–Kouri (Mali) (Bouët et al. 2021b). Along the first corridor, bribes demanded by *gendarmerie*, police, and/or customs officials were equivalent to an ad valorem tax of 22.5 percent on shipments, a level not seen since 2015.

Most of these measures were imposed with little warning, taking local populations by surprise and leaving them to contend with the fallout. Moreover, there has been little international or regional coordination of these border-related decisions. For example, curfew times often vary between neighboring countries, compounding their economic impacts.[14] With informal trade interrupted, many people have had little opportunity to find alternative livelihoods. For many families, the absence of income for even a few consecutive days has devastating effects in terms of poverty and food security.

Such measures may also interrupt international technical assistance (sanitary and/or food aid), imposing significant economic, public health, and other costs.

Border checkpoints equipped to provide health checks and screening, possibly followed by quarantine and/or hospitalization for the infected, were set up in only a few African countries. Such a system can support disease control by providing important health information to the population as well as better targeting of the distribution of protective equipment, soap, and disinfection equipment and access to water. In the East African Community (EAC),[15] nine mobile laboratories have been deployed to provide systematic testing, particularly along the northern border between Uganda and Kenya.

To help local consumers, some countries in various parts of the world adopted quotas and tariffs on exports of agricultural products in 2020. Export restrictions on agrifood products are often adopted with the intent of improving food security: they lower domestic prices by reorienting domestic supply toward the domestic market (Bouët and Laborde 2012). However, export restrictions also increase world prices, and so can harm food-importing countries, which includes many African countries.

According to the IFPRI Export Restriction Tracker (Laborde, Mamun, and Parent 2020), as many as 18 countries worldwide[16] adopted food-related export restrictions in April 2020, but most relaxed these restrictions rapidly, and as of June 2020, only four countries still had such measures in place (Figure 5.7). The share of global trade, measured in calories, affected by these restrictions never exceeded 6 percent.

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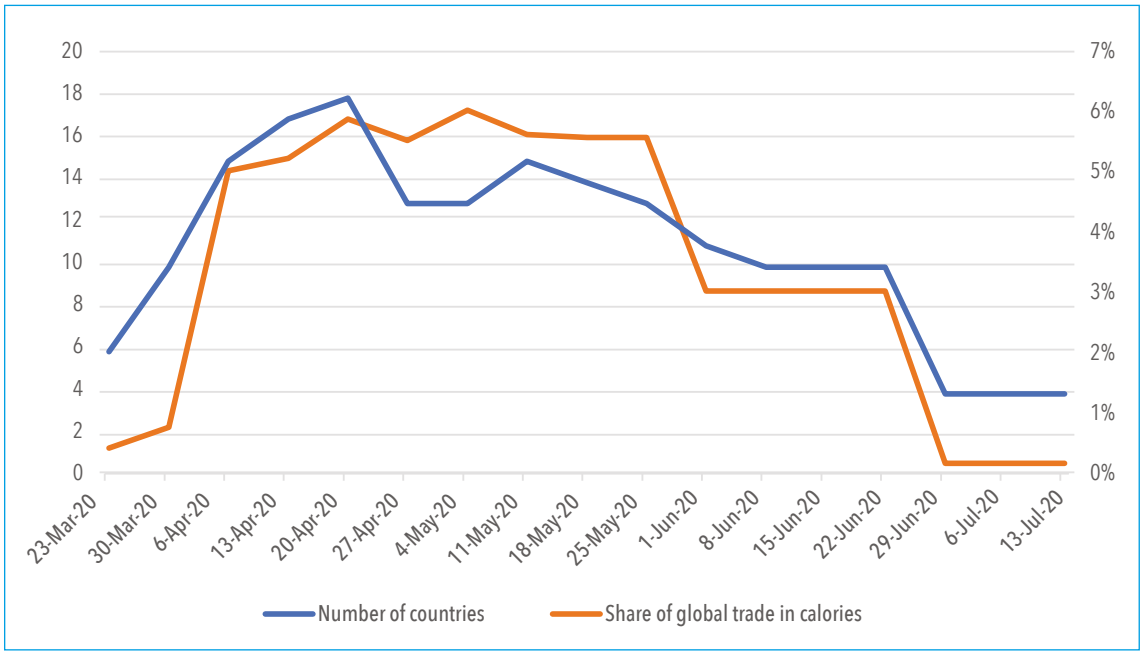
14 Information in this paragraph is drawn from the authors' interviews with Brahima Cissé (CILSS), January 21, 2021, and Thomas Awuor (FSNWG), January 25, 2021.

15 The EAC countries are Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda.

16 These were Algeria, Armenia, Belarus, Cambodia, Egypt, Honduras, Kazakhstan, Kyrgyzstan, North Macedonia, Pakistan, Romania, Russia, Serbia, South Africa, Syria, Thailand, Turkey, and Viet Nam.

Figure 5.7 Number of countries with food-related export restrictions in 2020 (left axis) and share of global trade in calories affected by these restrictions (right axis)



Source: Laborde, Mamun, and Parent 2020.

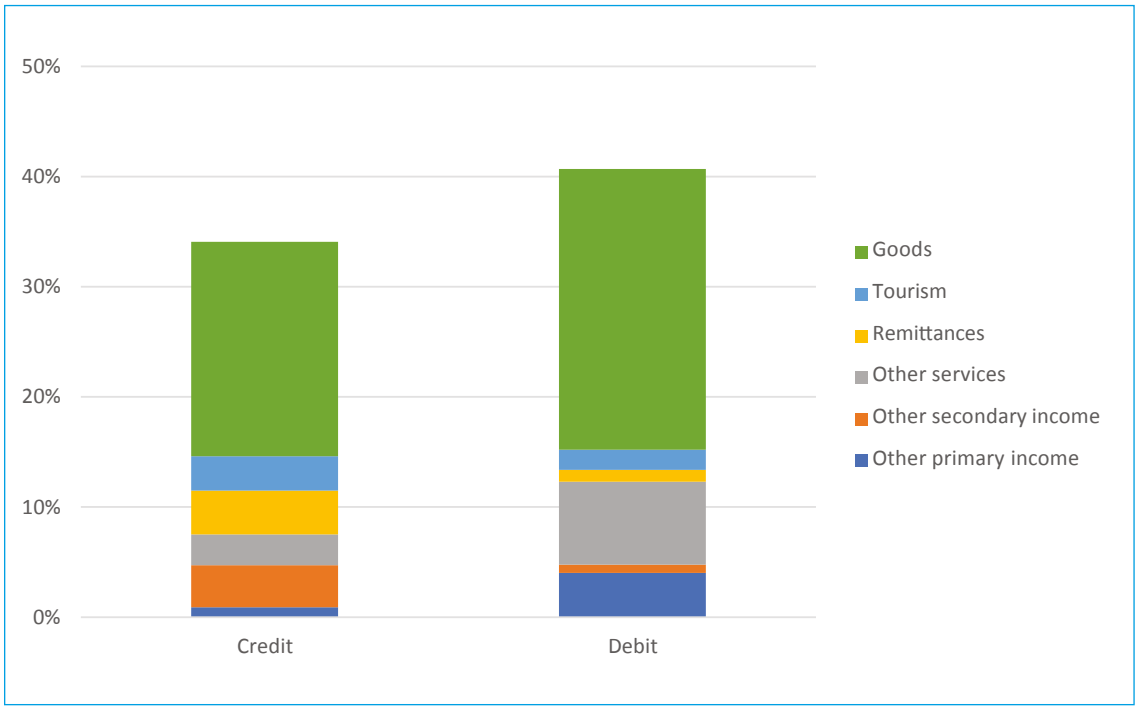
IMPACT TRANSMISSION CHANNELS

In this section, we look at the transmission channels from the health crisis to the economic crisis in Africa. At the macroeconomic level, the African continent depends on export revenues from raw materials, tourism, remittances, and international aid. Concerning trade, we examine how real effective exchange rates and trade costs have been affected.

Vulnerability in the African balance of payments

Figure 5.8 presents sub-Saharan Africa's pre-pandemic balance of payments in 2018, more precisely the current account. It shows that African imports of goods exceed African exports of goods, implying a trade deficit. Africa also imports more services than it exports; the only exception is tourism — inflows of cash related to tourist visits to Africa are greater than tourism-related outflows. The flow of remittances is also positive — African emigrants send more cash to their families in their country of origin than do people from the rest of the world who live in Africa. Finally, secondary income, which refers to transfers recorded in the balance of payments without a quid pro quo, is positive; African countries are net beneficiaries of secondary income and, in particular, technical assistance.

Figure 5.8 Sub-Saharan Africa current account as share of GDP, 2018 (%)



Source: IMF Balance of Payments database.
Note: "Credit" includes all economic operations that generate an inflow of foreign currencies. "Debit" includes all economic operations that generate an outflow of foreign currencies.

Thus, the African deficit in goods and most services is financed in part by net inflows of cash related to tourism, remittances, and technical assistance. The following sections look at how these components of the African balance of payments have been affected by the crisis.

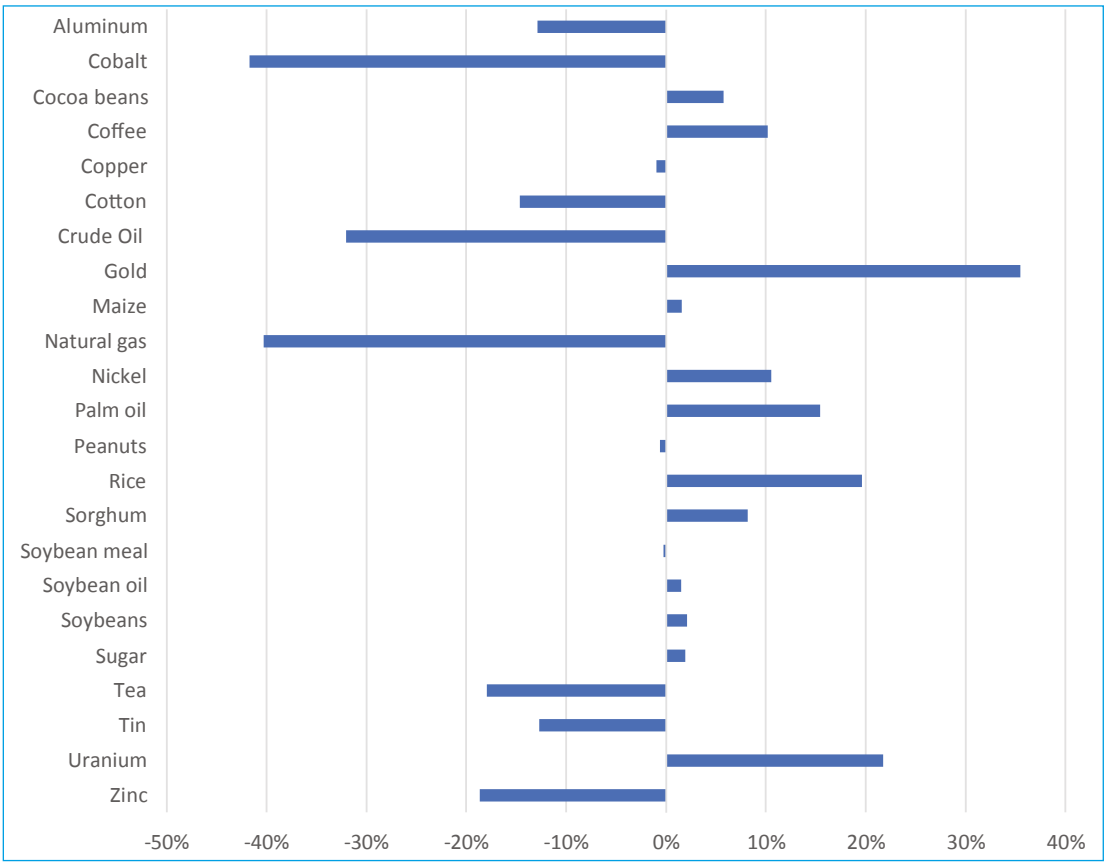
Trade in goods

African countries are major exporters of raw materials. To take the example of oil, three African countries were among the top 10 oil-exporting countries in 2019: Nigeria exported US$41 billion worth of oil, Angola $32.3 billion, and Libya $24.8 billion (Workman 2020).[17] With the pandemic, oil prices collapsed in April 2020 from $52–$64[18] to less than $20 per barrel.

Figure 5.9 shows the rate of variation in average prices for energy, base metals, and a few agricultural commodities between 2017–2019 and 2020.[19] Concerning energy, not only did the price of crude oil decrease by 32.1 percent, but also the price of natural gas (exported by Algeria and Nigeria) fell by 40.3 percent. The prices of cobalt (exported by DRC, Zambia, and South Africa), aluminum (South Africa and Mozambique), tin (DRC, Rwanda, and Nigeria) and zinc (Namibia) were down by 41.7 percent, 12.9 percent, 12.7 percent, and 18.7 percent, respectively.[20] For minerals and metals, the only good news has been the rising price of gold (exported by South Africa, Ghana, Burkina Faso, and Mali) and uranium (Niger and South Africa).

17 Throughout this chapter, "$" are US dollars, unless otherwise specified.
18 2019 oil prices were in line with prices recorded over the previous 15 years.
19 These are monthly data from IMF.
20 These statistics are from the IMF's Primary Commodity Prices.

Figure 5.9 Rate of variation of average commodity prices between 2017–2019 and 2020 (%)



Source: IMF Primary Commodity Prices.

Concerning agricultural commodities, African countries have benefited from an increase in prices for cocoa beans (large exporters of cocoa beans are Côte d'Ivoire, Ghana, Cameroon, and Nigeria), coffee (Ethiopia), and sorghum (Ethiopia, Sudan, Kenya, and Nigeria), but were hurt by the decrease in prices for cotton (Benin, Côte d'Ivoire, Burkina Faso, Egypt, Mali, and Sudan) and tea (Kenya was the world's fourth largest exporter of tea in 2019). The increase in rice prices has also been detrimental for the many African countries that are net importers of this cereal.

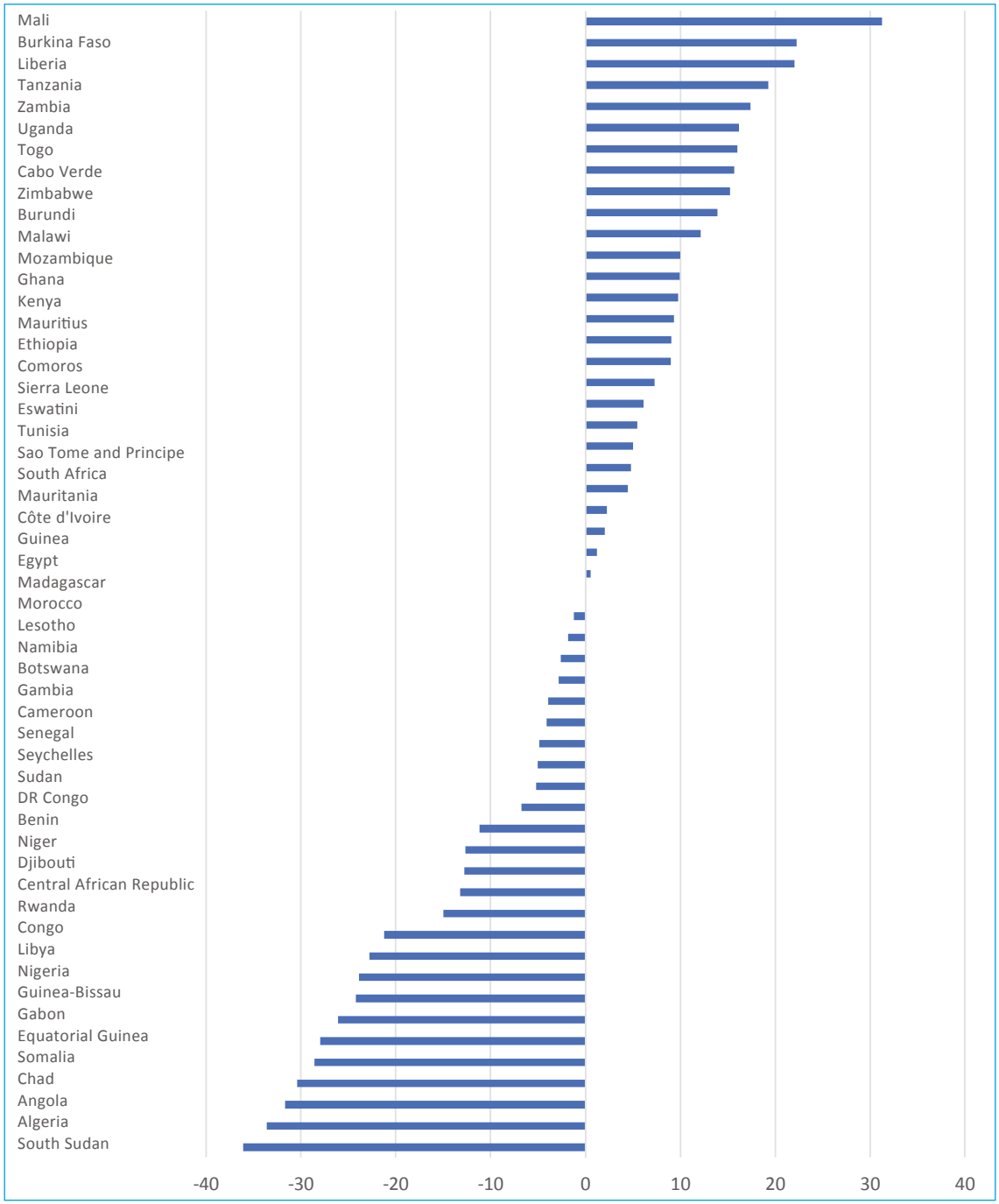
It is important to note that comparing two averages — in this case the average world price in 2020 and the average world price in 2017–2019 — can be misleading. For crude oil, the price per barrel started 2020 at over $68, only to collapse four months later. Then, it gradually rose to stabilize at just over $40 between early June and mid-November, and then rose again to end the year at $50. For oil-exporting African countries, the situation was especially difficult in the first half of 2020, but the second half of the year was comparable to the previous three years. For metals such as cobalt, tin, and zinc, the evolution was identical.

In Figure 5.10, we measure the effect of price variation with an indicator of terms of trade that takes into account the annual variation in prices of imports and exports together with the initial structure of exports and imports.[21]

21 This indicator is calculated by the formula: $\frac{\{\sum_i[px_i(t)-px_i(t-1)].\bar{x}_i-\sum_i[pm_i(t)-pm_i(t-1)].\bar{m}_i\}}{\sum_i px_i(t-1).\bar{x}_i}$, with $px_i(t)$ the export price of i at time t, $\bar{x}_i$ the average export of i during the last 3 years, $pm_i(t)$ the import price of i at time t, and $\bar{m}_i$ the average import of i during the last 3 years. So based on exports and imports of the previous year, the numerator measures the effect of price changes on the net trade surplus, and it is normalized by export value. The product list is all products from the HS6 classification.

In 2020, variations in terms of trade differed across African countries. Many countries were significantly affected by falling oil and gas prices (Algeria, Angola, Chad, Gabon, Nigeria, and South Sudan) and lower copper prices (DRC and Zambia). Others benefited from the increased price of cocoa beans (Côte d'Ivoire and Ghana) and gold (Burkina Faso, Mali, and South Africa). While most African countries benefited from decreasing prices for their manufacturing imports, others were significantly hurt by rising prices for key chemical inputs, in particular those used for mining and originating from East Asia, or for pharmaceuticals and medical equipment, whose prices were pushed up by the pandemic and by the large number of export restrictions on these products.

Figure 5.10 Terms of trade variation in Africa, 2020 (%)



Source: Constructed from AATM 2021 and COMEXT data.

Tourism

Tourism receipts are another major revenue source for African economies and an important source of economic activity and livelihoods. Tourism to Africa has grown significantly in recent years, with international tourist arrivals averaging 5 percent annual growth between 2005 and 2017.[22] Tourism receipts are especially large in Egypt ($14.3 billion in 2019, accounting for 27 percent of exports of goods and services), South Africa ($9.1 billion, 9 percent), Morocco ($10.0 billion, 21 percent), and Tunisia ($2.7 billion, 14 percent). For several small countries, tourism receipts represent a large share of GDP: 26.4 percent for Seychelles and 18.6 percent for Cabo Verde in 2018.

The health crisis directly affects all activities related to travel, and tourism has been among the most, if not the most, affected. According to the World Tourism Organization, in 2020, international arrivals dropped by 74 percent, with 1 billion fewer international arrivals and a loss of $1.3 trillion in export revenue globally. Africa is the second-most affected region, with a 75 percent drop in international arrivals (behind the Asia and Pacific region with 84 percent).

Remittances

Remittances provide another critical source of revenue for African economies. Among the top recipient countries globally, on average over 2017–2019, are Egypt (sixth with $25.6 billion) and Nigeria (seventh with $23.4 billion) and, over the same period, remittances represented 27.4 percent of GDP in Lesotho, 13.5 percent in Gambia, and 13.1 percent in Liberia (Plaza, Navarrete, and Ratha 2011).

These statistics illustrate clearly how a decrease in remittances related to the global economic recession could affect African economies. Facing higher unemployment in many places, migrants are expected to reduce remittances to their home countries. According to estimates by the World Bank (2021), remittances in value terms decreased worldwide in 2020 by 38.1 percent, and by 25.3 percent in Liberia, 24.8 percent in Lesotho, and 24.1 percent in Mozambique.

International aid

International aid is an important source of capital for many African countries, especially official development assistance (ODA) for the least developed countries. The general decline in tax revenues and the increase in health, economic, and social expenditures in rich countries in response to the pandemic raises concerns about a potential decline in ODA. A complete picture of the 2020 evolution of ODA will be available at the end of 2021.

In the short term, bilateral donors reduced aid commitments by 17 percent in 2020 compared with the previous year, whereas the international financial institutions (IMF, African Development Bank, and so on) increased commitments by 31 percent (Dodd, Breed, and Coppard 2020), which should more than offset the reduction of bilateral aid. However, this change has qualitative implications: First, international financial institutions prioritize not only health but also education and social protection, whereas bilateral donors give priority to health spending. Second, the shift augments the share of aid delivered as loans, which may affect the use of this aid and raises questions about debt sustainability, especially in low-income countries (Gaynor, King, and Ahmad 2020).

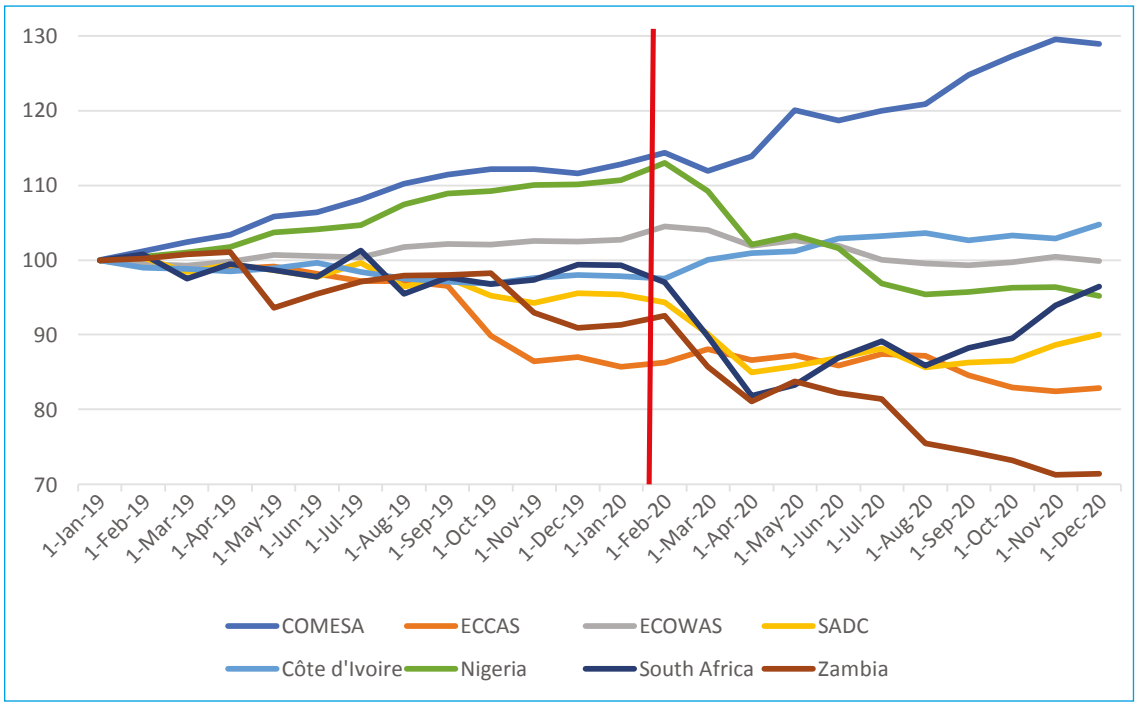
22 All the statistics in this paragraph are from World Development Indicators, accessed June 6, 2021; and the World Tourism Organization, accessed February 24, 2021, https://www.e-unwto.org/doi/pdf/10.18111/9789284419876.

Effect on real exchange rates

Figure 5.11 presents the evolution of African real effective exchange rates in four countries and four regional economic communities (RECs).[23]

Countries including Nigeria, South Africa, and Zambia saw a real depreciation of their currency at the onset of the pandemic. This depreciation may be a result of deterioration (or expected deterioration) in the current account related to falling remittances, tourism receipts, and revenues from oil and energy exports. While real depreciation can benefit local producers through improved price-competitiveness, it also makes imported products more expensive, meaning that food security may decrease if food products are imported. Some African countries that reduced imports during the pandemic (Burundi, Liberia, Madagascar, Tanzania, and Uganda among others [IMF 2021]) saw their currencies stabilize.

Figure 5.11 Real effective exchange rates in selected African countries and RECs (Jan. 2019 =100)



Source: Constructed from IMF and 2021 AATM database.

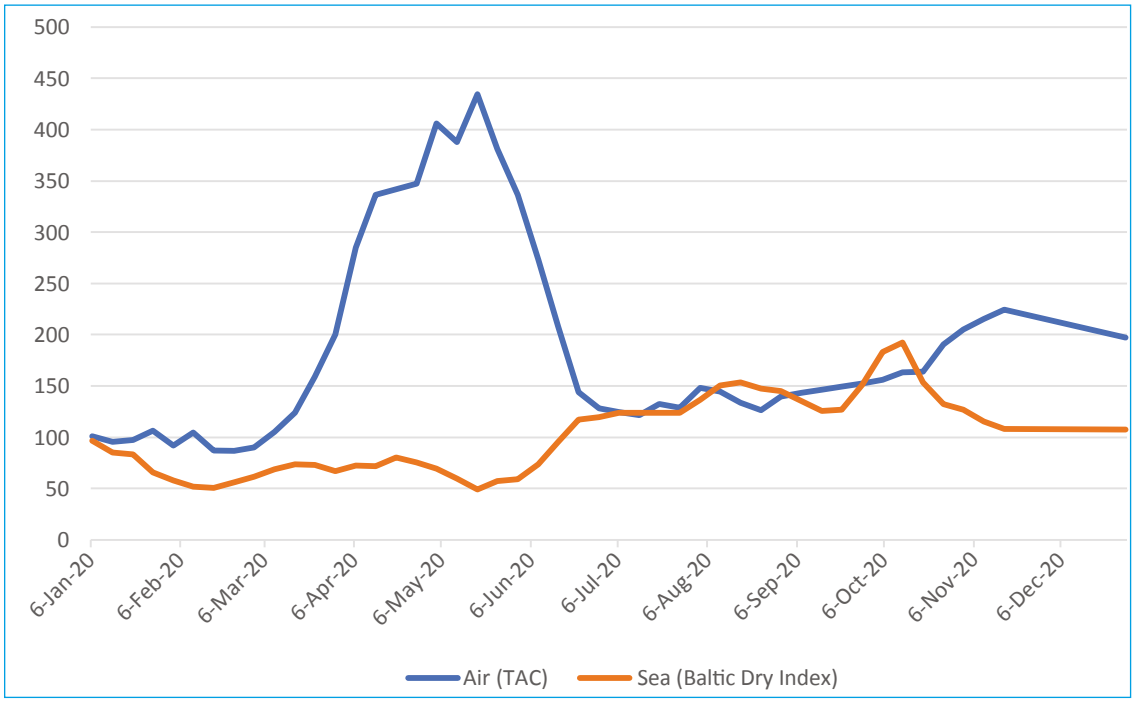
Note: The vertical red line marks the World Health Organization's first statement on the coronavirus. COMESA = Common Market for Eastern and Southern Africa; ECCAS = Economic Community of Central African States; ECOWAS = Economic Community of West African States; SADC = Southern African Development Community.

Effect on trade costs

COVID-19 has affected the cost of shipping food and other agricultural products, both by sea and air. Figure 12 shows sea-freight rates (measured by the Baltic Dry Index) and airfreight rates (measured by the TAC index) since January 2020. Sea-freight rates fell in the first quarter of 2020 when shipping to and from Asian markets (already dealing with COVID-19 outbreaks) diminished, and oil prices plummeted in response to reduced motor-vehicle use and global travel bans. As quarantines and other restrictions were relaxed in June and July, oil prices rebounded, and shipping rates began to climb. By August 2020, sea-freight rates were 20 percent above January levels, indicating that bulk shipping levels had recovered substantially.

23 "Real" means that the evolution of prices is considered, and "effective" means that the value of a currency is measured against a basket of partners' currencies.

Figure 5.12 Air and sea transportation costs (Jan. 2020 = 100)



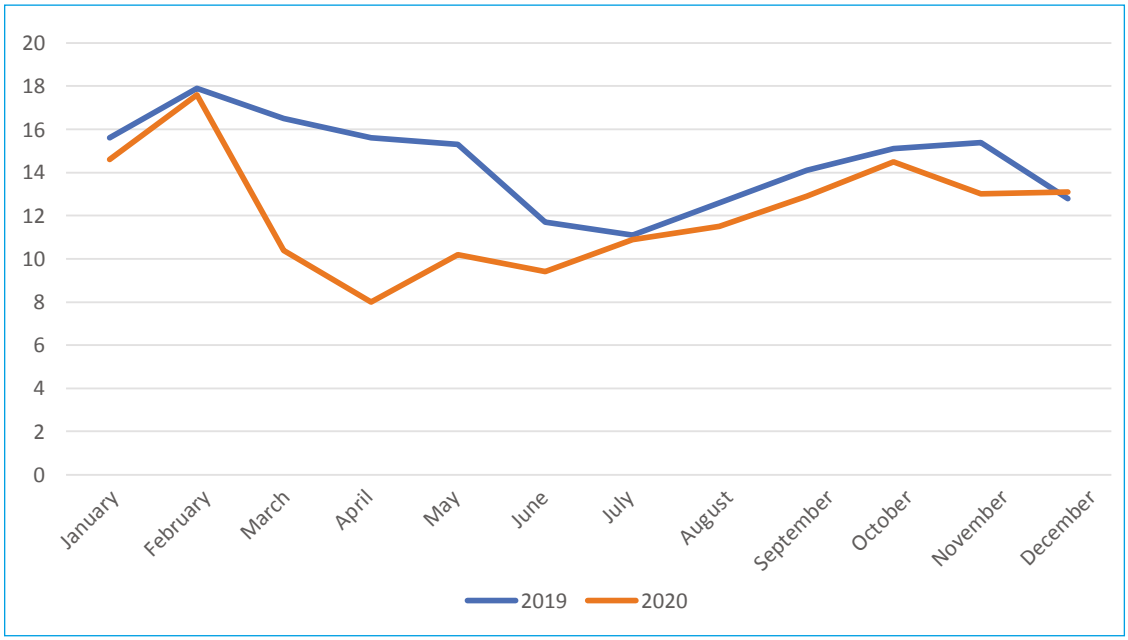
Source: Bloomberg News, https://www.bloomberg.com/; accessed on March 3, 2021.

African exports of highly perishable crops, such as fruits, vegetables, and cut flowers, are generally flown to destinations in Europe, Asia, and the Americas, much of it shipped as cargo on passenger flights. As international passenger flights were grounded or sharply reduced by lockdown measures, cargo flights became the primary shipping option and airfreight rates began to rise.

In Kenya, for example, airfreight charges for horticultural and floricultural exports rose from $1.85 per kg (prior to COVID-19) to as high as $4.00 per kg during lockdowns. Cut flowers are one of Kenya's major exports, going primarily to the European Union. But with restrictions on weddings, funerals, and public gatherings, along with high transport costs, flower exports plummeted (Figure 5.13). Cargo planes were limited, and with few goods to bring into the country, planes arrived empty, and exporters were forced to pay for both trips, according to Nicholas Kadiri, manager at Equator Flowers.[24] Compared with 2019 levels, cut flower exports fell by 15 percent in the first quarter, by 35 percent in the second quarter, and by 6 percent in the third quarter.

24 Authors' interview with Nicholas Kadiri on January 17, 2021.

Figure 5.13 Kenyan cut flower exports, 2020 ('000 metric tons)



Source: Kenya National Bureau of Statistics.

Likewise, the Baltic Dry Index (Figure 5.12) may not reflect all conditions of transport by sea. According to Roderick Straus, manager of logistics and freight at Touton, a French cocoa company, the transport of cacao beans from West Africa to Europe, conducted entirely by ship, did not suffer an increase in freight costs in 2020. Cocoa exports rely on the return trips of ships delivering goods from Europe, which must accept the price conditions demanded by the large cocoa companies or risk returning empty.[25]

After recovering in 2020, sea-freight costs continued to rise, and by August 2021, the Baltic Dry Index was 3.35 times higher than in January 2020. This sharp increase reflects the fact that the supply of cargo shipping is inelastic in the short term, meaning that small variations in demand result in large variations in freight costs. As a result this index is known to be volatile, especially in periods of uncertainty. In addition to sea freight, the price of oil has continued to rise, up from $53 per barrel in January 2021, to $66 in mid-August, after reaching a peak at $72 in July. The TAC index is likewise still on the rise. Airfreight costs from Shanghai to North America rose 168 percent between January 2020 and August 2021. Although many airlines converted passenger planes into cargo-only planes, their availability is now affected by the demand for transport for vaccines and other medical supplies. This demand is likely to remain high in the short to medium term, constraining the transport of high-value and perishable agricultural products.

ASSESSMENT OF THE TRADE AND ECONOMIC IMPACT OF THE CRISIS

This section provides an economic assessment of the crisis, with a special focus on African agricultural trade, economic activity, and poverty.

Impact on intra-African trade

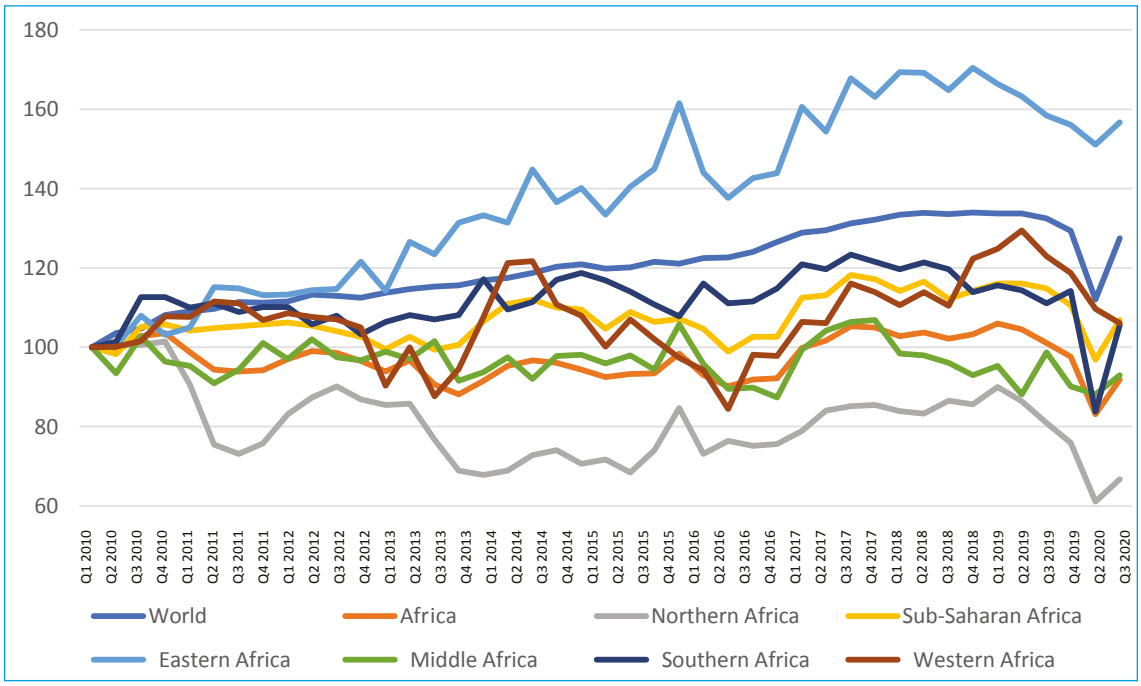
The WTO provides a few statistics on the evolution of international trade in 2020: world merchandise trade volume decreased by 5.3 percent, with a decrease of 15.0 percent year-on-year in the second quarter, but is expected to increase by 8.0 percent in 2021.[26]

25 Authors' interview with Roderick Straus on January 19, 2021.

26 https://www.wto.org/english/news_e/pres21_e/pr876_e.htm; accessed July 19, 2021.

The UNCTAD data portal[27] provides more detail, still at the aggregate level (all goods). Figure 5.14 shows the evolution in volume of total trade for Africa as a whole and for six African regions, with the volume of global trade included as a benchmark.

Figure 5.14 Volume index of total trade, seasonally adjusted (100 = 2010 Q1)



Source: Constructed from UNCTAD data.

These data confirm that the COVID-19 pandemic has sparked an unprecedented decline in world trade (down by 15.5 percent in volume between the fourth quarter of 2019 and the second quarter of 2020), and an even more pronounced drop for Africa as a whole — down 17.7 percent. Southern and North Africa have been particularly affected, with decreases of more than 24 percent.

As of this writing (May 2021), no international institution (FAO, UN Comtrade, UNCTAD, or WTO) has complete statistics on African agricultural trade (exports and/or imports) available for 2020. Production of trade data is extremely time-consuming. In addition, in Africa, data on intraregional trade are often imprecise (Bouët, Cissé, and Traoré 2020).

Simulated impact on trade, GDP, and poverty

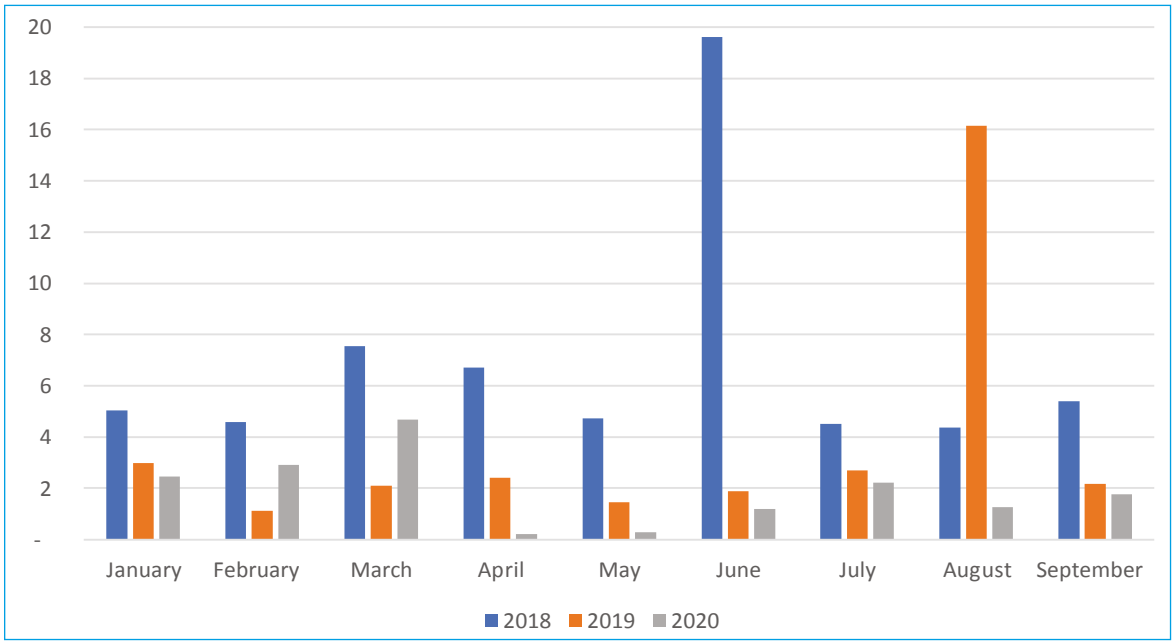
First, we review statistics on agricultural trade in West Africa from ECO-ICBT, a platform operated by CILSS and APEX organizations[28] in West Africa, which gathers data on trade between West African countries for more than 100 agricultural products. Enumerators are positioned at marketplaces and border posts and collaborate with traders and transporters to collect data.

Figure 5.15 shows total trade between Benin, Burkina Faso, Ghana, and Togo for all agricultural products targeted by the ECO-ICBT initiative. This "central basin" of West Africa is the area best covered by the initiative; however, the quality of data collection has been affected by a drop in funding in 2019.

27 https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx; accessed March 2, 2021.

28 An APEX organization, or "organisation faîtière" in French, is a group of companies that have the same interests. Here, the companies collaborate because they produce, transport, or sell the same agricultural commodity.

Figure 5.15 Trade of CILSS products (by value) between Benin, Burkina Faso, Ghana, and Togo, 2018–2020 (US$ millions)



Source: Constructed from ECO-ICBT data.
Note: CILSS products are agricultural products (cereals, live animals, fruits, vegetables) covered by the initiative; see Bouët et al. (2021a) for a precise definition.

Trade of CILSS agricultural products was almost entirely shut down in April and May 2020, and remained relatively low from June to September 2020, as compared with both 2018 and 2019.

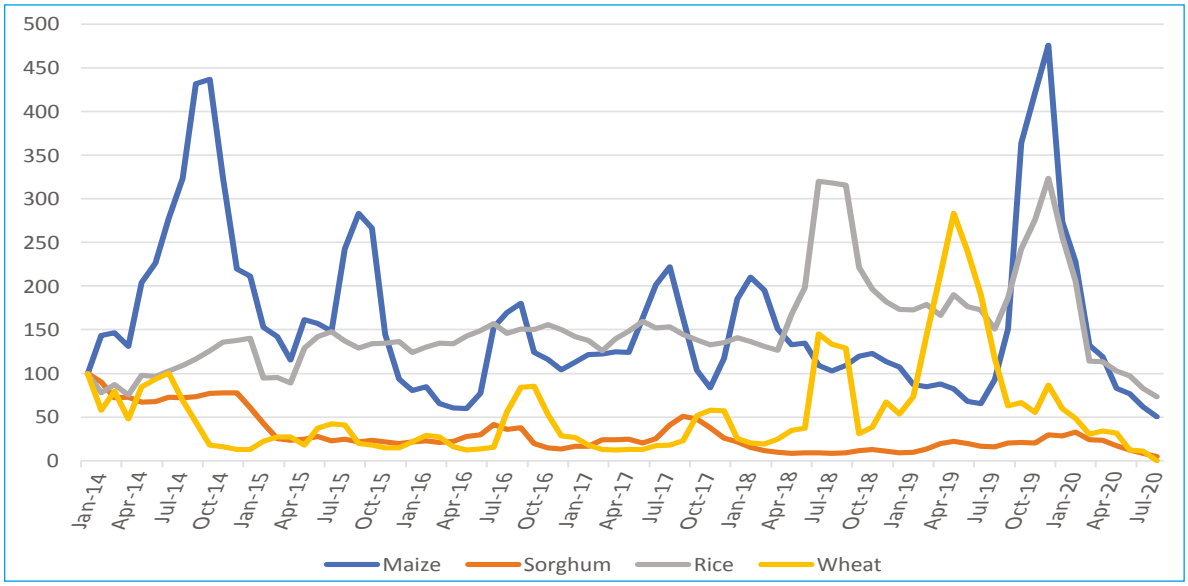
The Food Security and Nutrition Working Group (FSNWG) in Eastern Africa,[29] through its Market Analysis sub-group, conducts a survey of informal cross-border trade between Burundi, DRC, Djibouti, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania, and Uganda. The FSNWG initiative, started in 2005, covers 88 food commodities and livestock.

Figure 5.16 provides the volume (using an index based on volumes in January 2014) of trade in four cereals (maize, rice, sorghum, and wheat) passing through the 35 border posts covered by the initiative. Between December 2019 and July 2020, this initiative estimates that the traded volume of maize decreased by 87.1 percent, of sorghum by 71.0 percent, of rice by 74.4 percent, and of wheat by 87.2 percent. In July–August 2020, the level of trade of these four cereals was recorded at its lowest level since January 2014.

The head of the FSNWG initiative, Thomas Awuor, notes that regional trade in cereals has been hard hit by pandemic-related restrictions.[30] Customs officers had to record all commodities passing through the border posts as part of the COVID-19 screening of drivers; as a result, trade in small quantities, carried out by individuals, was almost completely disrupted.

29 We thank Thomas Awuor from FSNWG for providing access to these data.
30 Personal communication with Thomas Awuor, January 23, 2021.

Figure 5.16 Trade volume index of cereals in eastern Africa, 3-month moving averages (100 = January 2014)

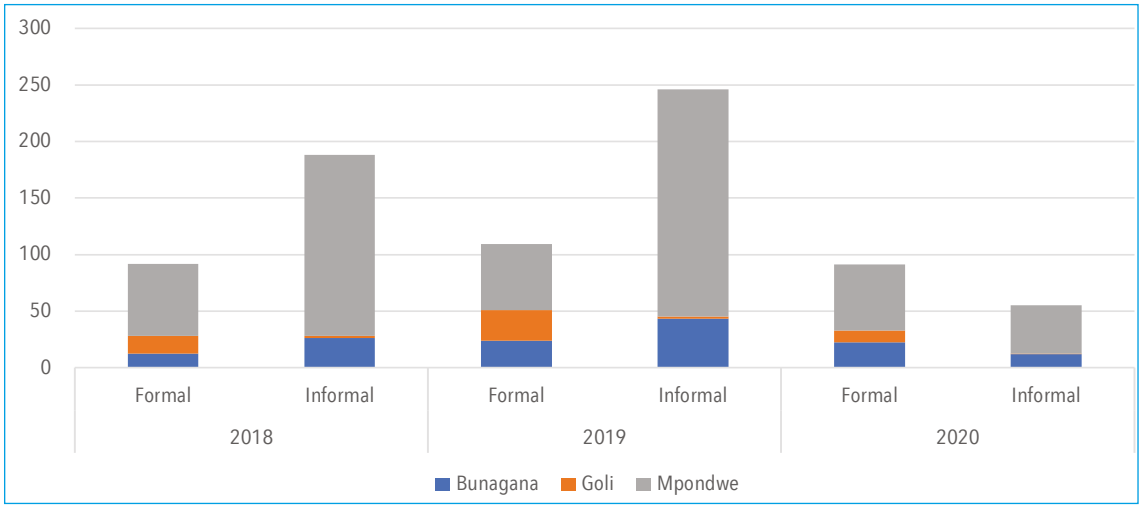


Source: Constructed from FSNWG data.

In Uganda, in addition to a permanent initiative launched by the Uganda Bureau of Statistics (UBoS) to collect data on formal and informal cross-border trade, UBoS also conducted a survey on time required to cross the borders and the value of trade at three posts (Bunagana, Goli, and Mpondwe), all on the border with DRC but located respectively in the southern, northern, and central regions of Uganda, in 2019 and 2020 (May and October). At these borders, informal trade is often carried out by individuals who transport small quantities of goods, which as such are not recorded by customs officials. Trade value crossing these borders is indicated in Figure 5.17, with a distinction between formal and informal trade.

At these three border posts, trade decreased by 58.8 percent between 2019 and 2020, with formal trade reduced by only 16.4 percent while informal trade fell by 77.6 percent. The UBoS report indicates that the restrictions at these borders consisted largely of closure for most small-scale informal traders, who usually transport agricultural goods.

Figure 5.17 Trade value at three border posts in Uganda (US$ million)



Source: UBoS 2020.

Simulating the impact on trade, GDP, and poverty

A global CGE model

David Laborde, at IFPRI, has conducted two simulations of the economic consequences of COVID-19 using IFPRI's global model (Laborde, Martin, and Vos 2020). MIRAGRODEP is a dynamic, multicountry, multisector computable general equilibrium (CGE) model. To estimate the poverty impact of the shock, MIRAGRODEP is connected to the POVANA household dataset and model, which include data on the full income distribution for over 300,000 representative households globally. The model and the dataset are linked a top-down fashion, where the shock is simulated at the macroeconomic level and its microeconomic consequences replicated at the household level.

The model simulates economies affected by COVID-19, with labor supply modified by mortality and morbidity and social distancing measures covering between 40 and 50 percent of the population, a shutdown of international travel and many tourism-related activities, an increase in freight costs due to bottlenecks in international transport, increased postharvest losses, and a stimulus package in rich countries.

Two scenarios were run in MIRAGRODEP. The first was conducted early in the pandemic, in April 2020. This scenario is based on authors' observations and interpretations of the health crisis, the mitigation steps taken up to that point, and the impact of the pandemic on the world economy. Although the basic methodology has not changed, new information was available by the third quarter of 2020 about COVID-19 effects on social distancing, labor supply, and policy responses, which differed from some assumptions of the original scenario. The second scenario, run in September 2020, reflects newer data on mortality, morbidity, and social distancing; results for African countries are noticeably less pessimistic with regards to morbidity and the impact of economic measures related to COVID-19.

Under the initial scenario, the model forecast a drop in global economic growth to −5 percent in 2020. This projection is broadly similar to the early 2020 IMF forecast, and also the January 2021 estimates from the World Bank, with the poorest nations facing significantly greater adversity. The recession in this scenario is projected to depress economic activity across developed countries by 6 percent on average in 2020, and to spill over to the rest of the world through lower demand for imports and lower commodity prices. For developing economies, the model projects economic fallout from their own social distancing measures and from increased morbidity affecting the labor supply for farming and other business activity.

In this first modeling exercise, African economies are hit hardest, with an almost 9 percent decline in GDP. It estimates that globally, absent interventions, 148 million people could fall into extreme poverty (measured against the PPP$1.90 poverty line) in 2020 — an increase of 20 percent from present levels. This in turn drives up food insecurity. The model indicates that urban and rural populations in Africa south of the Sahara suffer most, with an increase of 79.4 million poor people, or 14.8 percent (Table 5.1, scenario of April 2020).

The second scenario (Table 5.1, scenario of September 2020) better reflects the evolution of the world economy since the beginning of 2020 and includes new data on mortality and morbidity. In addition, the shocks were made more country-specific. In this scenario, the impact of mortality and morbidity on labor supply is smaller in Africa and greater in India than in the first scenario.

The big picture from this second scenario is that the global recession is expected to be even deeper in 2020 (a 7.1 percent decline in global GDP, much deeper than the 5.1 percent decline projected by the earlier scenario). The revised assumptions do not change the earlier expectation that the agrifood sector would fare relatively well, showing resilience compared to the rest of the economy. Globally, the agrifood sector could even expand, as agricultural

production remains relatively stable while costs are down because of the drop in prices for manufacturing and services.

The aggregate findings for global poverty are almost unchanged from the first scenario, with the number of poor expected to rise by just under 150 million. However, the regional distribution of poverty growth differs substantially from the first projection. In the September 2020 scenario, the economic crisis is expected to be deeper than previously anticipated in South Asia, particularly India, and milder in Africa. As a result, this simulation projects a smaller, though still significant, increase in poverty in Africa south of the Sahara (50.5 million rather than 79.4 million people), with a larger increase in South Asia (72.5 million rather than 42.1 million people).

Table 5.1 Poverty and macroeconomic impact projections, MIRAGRODEP COVID-19 scenarios

	MIRAGRODEP COVID-19 scenario	
	April 2020	**September 2020**
Real GDP growth		
World	−5.1	−7.1
Low- and middle-income countries	−3.6	−5.5
Africa south of Sahara	−8.9	−5.8
South Asia	−5.0	−12.9
Agrifood real value added (percentage change from previous year)		
World	−1.8	2.5
Low- and middle-income countries	0.1	2.3
Africa south of Sahara	3.9	2.0
South Asia	−2.0	0.1
Changes in extreme poverty ($1.90 pp/pd poverty line, millions of people; changes from baseline)		
Low- and middle-income countries	147.5	149.7
Africa south of Sahara	79.4	50.5
South Asia	42.1	72.5

Source: MIRAGRODEP and POVANA simulations.
Note: pp/pd = per person per day.

Evaluating the socioeconomic impact by country from a household perspective

Understanding the extent to which the pandemic has affected households is a key element in evaluating the impact of COVID-19 in Africa. One approach to capturing the distributional impact of the crisis on households begins by making some informed assumptions about how the shock has affected job and income losses, and then uses household surveys to compare the resulting income, consumption, and poverty distributions with those prior to the pandemic.

A key concept in these projections is "at-risk" incomes, namely, those that are likely to be negatively affected by the pandemic. Apart from pensions and salaries for public servants and top management in the private sector, which can be considered as "safe" incomes, all other incomes are assumed to be at-risk.

As a first approximation, no precise assumptions are made regarding the extent to which these incomes are reduced. Instead, we consider different scenarios, varying the proportion of income loss and the share of households involved from 0 to 100 percent. This approach is dubbed Approach 1.

For Approach 2, knowledge of the context (from reports, surveys, and the media) are used to make relatively precise and educated guesses about the extent of income losses. For instance,

a survey conducted by the Ministry of Commerce and Small and Medium Enterprises in Senegal reveals a drop in small and medium enterprise (SME) activities ranging from 30 to 100 percent. While the World Bank estimated that remittances would drop by 23.1 percent in 2020 in sub-Saharan Africa, in Senegal, the Ministry of Finance estimated a 30 percent decline in remittances. In Ghana, a statement made by the Minister of Finance to the parliament suggests that hotel occupancy declined from 70 percent to below 30 percent during the country's lockdown. In addition, Ghana's agriculture sector GDP dropped by 16 percent during the lockdown, but urban incomes declined 8.2 percentage points more than rural farm income, while nationally, incomes declined by 6.2 percentage points more than rural income.

Such an approach to scenario development has been applied for Senegal, Ghana, and Uganda. While these countries have suffered total COVID-19 cases and deaths above the continental average, the per capita figures (rates of infection and death) tend to be lower, as indicated in Table 5.2, suggesting some efficacy of the health responses. However, the socioeconomic impacts are expected to be very large, to the extent that containment measures have led to job and income losses and a deterioration in living conditions in these countries, as summarized in Table 5.3.

Table 5.2 COVID-19 incidence and deaths in Senegal, Ghana, and Uganda in the African context

	Cases: cumulative total	Cases: cumulative total per 100,000 population	Deaths: cumulative total	Deaths: cumulative total per 100,000 population
Senegal	32,630	194.88	795	4.75
Ghana	79,656	256.35	572	1.84
Uganda	40,199	87.88	333	0.73
Africa average	26,276	472.84	437	5.89

Source: WHO, as of February 21, 2021, https://covid19.who.int/table?tableChartType=heat.
Note: The African averages do not include South Africa, which alone accounts for 53 percent of the total cases for the continent.

Table 5.3 Summary results of estimated COVID-19 socioeconomic impacts in Senegal, Ghana, and Uganda

	Senegal	Ghana	Uganda
Total income losses (US$ millions)	1,239.0	325	184
Share of monthly GDP (%)	4.9	5.3	9.1
People losing income (millions)	12.8	8.0	27.0
Share of total population (%)	79.0	26.0	65.8
Most affected sectors	Hotels/bars/ restaurants; Transport; Personal services; Services to enterprises; Agriculture	Transportation and storage; Manufacturing; Education; Wholesale and retail	Transport; Nonfood retail; Education; Nonbeverage crops
Poverty headcount (national, pp)	+16.5	+13.4	+7.9
Capital city	+14.6	+21.6	+16.7
Other urban	+11.6	+18.9	+12.9
Rural	+19.0	+5.8	+6.1

	Senegal	Ghana	Uganda
People falling into poverty (national, millions)	2.7	4.2	3.3
Capital city	0.55	1.7	0.29
Other urban	0.38	1.6	1.08
Rural	1.74	0.8	1.93
Inequality (national, Gini)	+0.042	+0.052	+0.008
Capital city	+0.035	+0.131	+0.105
Other urban	+0.033	+0.085	+0.046
Rural	+0.030	+0.011	+0.006
Monthly transfer budget to fully offset the poverty impact (US$ millions)	88.5	186	13.6
Share of monthly GDP (%)	4.2	3.0	0.7

Sources: Seck (forthcoming), Issahaku and Abu (forthcoming) for Senegal and Ghana; Younger (2020) for Uganda.
Note: Results are based on specific assumptions regarding how "at-risk" income may have been impacted (Approach 2). For Ghana, "capital city" refers to Accra and Kumasi. pp stands for percentage points.

The case of Senegal

As more and more households lose an increasing share of their income (Approach 1), total income losses grow. In a scenario where 50 percent of households lose half of their at-risk income, total losses reach $67.9 million, or 3.1 percent of monthly GDP. In the worst-case scenario in which all households lose 100 percent of their at-risk income, losses reach $263.2 million or 12.6 percent of monthly GDP.

For any combination of the share of households losing income and share of income lost, rural areas appear to be less affected than urban ones, with 47.6 percent of total losses or $125.3 million per month under Approach 1. Rural areas are less densely populated and dwellings are scattered, making lockdowns and other containment measures difficult to fully enforce. In addition, rural incomes are much smaller, potentially making the extent of losses smaller. However, the sheer quantity of losses suggests that rural households and activities are indeed hit hard by the pandemic.

Nationally, the poverty rate is forecast to increase from 39 percent (prior to COVID-19) to 72.3 percent in the worst-case scenario (100 percent income loss by "at-risk" income earners). This 33.3 percentage point increase effectively erases the poverty gains made over the last two decades. In rural areas, where poverty incidence was the highest before the pandemic, the impact is more pronounced — the poverty rate increases from 49.0 percent to 83.1 percent, a 34.1 percentage point change for the worse.

Inequality is also expected to worsen. The Gini coefficient is estimated to increase from 0.378 (base scenario) to 0.571 (worst-case scenario).

Approach 2 generates more accurate results. For instance, a survey of SMEs conducted by the Ministry of Commerce in May 2020 showed that the hardest hit sectors in terms of loss of income are hotels/bars/restaurants (72 percent drop), transport (54 percent), personal services (51 percent), services to enterprises (46 percent), and agriculture (42 percent). Such losses are assumed to translate into income losses for workers in these sectors. Additionally, while income from public sector employment, pensions, top management, and own consumption are considered to be safe, income from air transport and recreation/culture/sports are assumed to disappear, while remittances and domestic money transfers are estimated to decline by 23.1 to 30 percent.

Using Approach 2, the COVID-19-related impact amounts to a total income loss of 4.9 percent of monthly GDP. In total, 12.7 million individuals, or 79 percent of the total population, are affected by these losses. Rural areas appear to be almost equally affected in terms of the amount lost (50.4 percent), but impacts are much greater in terms of the number of people losing income (61.7 percent).

The agriculture sector bears the brunt of income losses. The absolute losses in the sector of $36.5 million account for 39.2 percent of the total income losses. This may be explained by the sheer size of the agriculture sector, which is home to 42.4 percent of workers, most of whom (99.4 percent) lose some part of their income in this scenario. Other reasons for the concentration of losses in the agriculture sector include (i) the ban on travel among the Senegalese regions and with the neighboring countries, (ii) loss of internal remittances resulting from lost income and jobs in urban areas, which could affect agricultural activities in rural areas (such as purchase of inputs), and (iii) the closure of the maritime route between Ziguinchor, a major agricultural production zone, and Dakar, which is synonymous with lost economic opportunities for farmers in the South.

Correspondingly, poverty increases by 16.5 percentage points nationally (with 2.7 million new poor), and 19.0 percentage points in rural areas (1.7 million new poor, or a 63 percent poverty rate). This large spike in rural poverty explains why inequality within rural and within urban areas is less affected than inequality at the national level.

Offsetting the poverty consequences of the pandemic with a fiscal response in the form of monthly per adult equivalent transfer estimated at $8.5, or $76.7 for the average household, would reduce the rate of impoverishment by 6.2 percentage points (the transfer reducing the rate of nonpoor becoming poor from 8.8 percent to 1.6 percent), and a gain of 2.7 percent escaping poverty (poor becoming nonpoor). These transfer impacts are larger in rural areas, with benefits of 10.1 percent (decline in impoverishment) and 3.5 percent (increase in nonpoor).

The corresponding budget would be $88.5 million; such a transfer policy should be affordable for Senegal's government. In fact, the early response plan designed to combat the adverse effects of the pandemic amounted to FCFA 1,000 billion ($1.8 billion), primarily from the central government budget, the central bank, foreign assistance, and various donations. The transfers for one month would represent 4.9 percent of this total budget. As the scheme is expected to entail many monthly payments, the total budget share would be larger. For instance, with a six-month span, the policy would require 29 percent of the total budget, leaving plenty of resources for additional support measures to households and firms, as well as medical and health interventions.

The case of Ghana

The pandemic is estimated to cost Ghanaian households $325 million, or 5.3 percent of monthly GDP. Some 8 million individuals are directly affected by these partial or full income losses, representing some 26 percent of the total population. Rural areas account for only 13.2 percent of the total income losses, but 42.8 percent of the affected population. The Greater Accra Metropolitan Region, the largest urban area, is the most affected region by far, with aggregate losses of 39.6 percent and one-third of its residents suffering income losses.

The sectors most adversely affected are transportation and storage (15.7 percent of total income losses), manufacturing (15.6 percent), education (11.9 percent), and wholesale and retail (10.8 percent). In terms of income, agriculture, forestry, and fisheries are among the least impacted, but these primary sectors are the most impacted in terms of the number of people affected, with nearly one-third (32 percent) of total income losers.

The extent of income losses and the number of people affected in rural areas, where agriculture is a major source of income for a large share of the active population, suggests relatively small losses per capita (just 0.6 percent of the cross-industry average), but this loss could have a profound impact on already-poor households.

At the national level, poverty incidence is estimated to increase from 20.5 percent to 33.9 percent, up 13.4 percentage points. This corresponds to 4.2 million people joining the ranks of the poor. As with income (and consumption) losses, the poverty impact is smaller in rural than in urban areas. Although rural poverty rates are higher than urban poverty rates both pre- and post-COVID, rural poverty is expected to increase by just 5.8 percentage points, from 37.7 percent to 43.5 percent. In contrast, urban poverty jumps from 1.1 to 20.6 percent in Accra (a 19.5 percentage point increase), and from 3.5 to 27.1 percent in Kumasi (up 23.6 percentage points).

An increase in income inequality is indicated by a rise in the Gini coefficient from 0.421 to 0.473. Inequality increases more in urban areas than in rural areas, to the point that urban areas are projected to become more unequal than rural areas as a result of the pandemic.

Returning to the pre-pandemic poverty incidence would require a transfer policy in the form of a universal cash transfer of $186 million, representing 3 percent of monthly GDP. This amounts to an average transfer per adult equivalent to $8.7 per month.

The case of Uganda

Despite having relatively few COVID-19 cases, Uganda is significantly affected by the pandemic and the corresponding containment and mitigation measures. The reduction in economic activities and corresponding job losses is estimated to cause an income loss of $184 million, or 9.1 percent of monthly GDP. About 27 million people, 65 percent of the total population, suffer either partial or full loss of income.

As in the Ghanaian case, rural areas tend to be less affected by income losses, with 40.7 percent of the total. But far more people are impacted in rural areas, with a total of 19.8 million people affected, or 73.3 percent of the national total, although the exposure to the shock is larger in urban area areas (68 percent of residents in Kampala lose income, and 72 percent in other urban areas) than in rural areas (63 percent).

The largest share of income losers is found in crop growing (excluding beverage crops): 0.8 million out of the total of 2.8 million engaged in growing crops, or 27.8 percent. Adding activities such beverage crops, livestock raising, forestry, and fishing makes agriculture home to more than 35 percent of income losers. However, remittance losses have a larger effect on poverty than earned-income losses in any other single industry.

Nationally, the poverty incidence is estimated to rise from 18.9 to 26.8 percent, an 8 percentage point increase. This reflects 3.3 million Ugandans pushed into poverty by the pandemic, effectively erasing poverty gains of the past 10 years. The capital, Kampala, sees the largest increase in poverty, up from 2.2 to 18.9 percent (16.7 percentage points), followed by other urban areas, where poverty increases from 9.1 to 22.0 percent (12.9 percentage points). Rural poverty rises from 22.4 to 28.5 percent (4.1 percentage points).

Inequality is also estimated to worsen at the national level, with the Gini coefficient increasing from 0.419 to 0.427, mainly driven by urban areas.

Transfer payments based on a total monthly budget of $73 million, or 3.6 percent of monthly GDP, are shown to fully mitigate the poverty impact of the pandemic. The corresponding per adult equivalent transfer would be $2.6.

Overall, the COVID-19 pandemic has adverse and significant impacts on the whole economy, and notably on both the agriculture sector and the livelihoods of the large population that depends directly or indirectly on agriculture.

CONCLUSION

On the health front, Africa has fewer cases and fewer deaths related to COVID-19 to date than the rest of the world; we have discussed several reasons for this relatively positive short-term impact. Nevertheless, the long-term impact of the virus could be very different. Vaccination campaigns are expected to start later and progress more slowly in Africa. Moreover, new variants of the virus have emerged in South Africa, which appear to be spreading more easily and are expected to cause many more infections. After a first wave of confirmed cases in Africa, which peaked in mid-2020, a second wave peaked at the end of the year, and a 40 percent increase in deaths was observed in January 2021 compared with the previous month (Mwai 2021). As of May 13, 2021, cumulative cases had reached 3,335,711 and deaths had reached 84,108. About half of all cases have occurred in South Africa and Ethiopia; these two countries also account for 70 percent of total deaths on the continent (WHO 2021).

On the policy front, African governments have been reactive, especially on health issues. Concerning economic responses, African governments have been also reactive, but they have been more constrained than high-income countries by limited financial capacities.

Revenues from tourism and remittances have collapsed. International aid and bilateral donors have reduced aid commitments, but an increase in development assistance from international institutions should compensate for the lost funds. Terms of trade deteriorated in 2020 for some African countries, but clearly improved for a few others.

African trade has suffered substantially. The region exports a few cash crops (cocoa, coffee, tea) for which demand is stable, and many niche products for which demand is more variable during economic disruptions (vanilla, cloves, cashew nuts, sesame seeds, etc.), or which are sensitive to transport conditions (fresh, perishable products). In addition, a large share of intra-African trade is informal; this trade is particularly sensitive to border-crossing restrictions. This is especially the case for informal trade of small quantities conducted by individual traders, an important source of income for many African households.

In terms of economic activity, African countries seem to be emerging from 2020 in better shape than much of the world. The World Bank estimates that economic activity contracted by only 3.1 percent in Africa in 2020 compared to 4.3 percent at the global level. Nevertheless, as population growth is higher in Africa, the World Bank also estimates that GDP per capita on the continent declined by 6.1 percent in 2020 (World Bank 2021).

The crisis has shown that some African economies are insufficiently diversified: Equatorial Guinea (−9.0 of GDP in 2020) depends on oil; and Cabo Verde (−11.0), Mauritius (−12.9), and Seychelles (−15.9) depend on tourism (World Bank 2021). This finding concerning oil dependency is common to almost all crises affecting the African continent. What is new is the evidence that some African countries may be too dependent on tourism receipts and remittances.

The crisis has also highlighted the fiscal limits to African governments' crisis responses. Sub-Saharan governments' spending in response to the pandemic was equal to just 3 percent of

their GDP; rich countries' spending reached 7 percent of GDP (*Economist* 2021). Moreover, public access to health and sanitary supplies as well as to vaccines and medicines is too limited in African countries.

Concerning agricultural trade, international cooperation has been relatively stronger than during the 2007–2009 crisis, and export restrictions on agricultural commodities have been limited in both impact and duration. However, African countries have increased trade restrictions, especially along land borders between countries. Although the policies that increased sanitary controls were justified in terms of health, they have been particularly detrimental to informal traders.

The newly implemented African Continental Free Trade Area offers an institutional scheme to achieve trade goals, including strengthening intra-African trade relationships and developing regional value chains. To date, existing integration schemes have failed to significantly strengthen trade ties among African countries. To the extent that intraregional trade tends to be more concentrated in processed agricultural products than trade with the outside world, which favors commodities (Dedehouanou, Dimaranan, and Laborde 2019), developing trade ties among African countries would help them climb the ladder of value chains.

These policy findings are all important, but they are not specific to the implications of this crisis for African trade policies. What this crisis has also shown in terms of agricultural trade is, first, that it is important to reduce trading costs in formal trade to give all traders the incentive to use official channels of cross-border trade. Second, in times of pandemics or other global crises, international coordination of trade policies is needed more than ever. International coordination should help to limit the use of export restrictions, coordinate increased sanitary controls at borders, curfews, and the functioning of marketplaces, increase information on prices and quantities of food and agricultural products in different places, and so on. Third, this crisis shows the importance of improving the quality of economic data in Africa. It is crucial to ensure continual access to reliable data on agricultural trade in almost "real-time."

Finally, it will be a long time before the vaccination campaign achieves herd immunity. The COVAX initiative is funded, but plans call for only 2 billion doses of vaccine to be delivered by the end of 2021.[31] While this is a lot, it implies that only a small part of the African population will be vaccinated by the end of 2021. As of May 15, 2021, a few African countries had almost depleted their stock of vaccines (Nebe 2021); this comes two months after the "export pause" of the Serum Institute of India, which is the main supplier of vaccines under the COVAX initiative. Moreover, Africa is carrying out few COVID-19 tests.[32]

The end of the crisis is not yet in sight. As a result, the impact on young people's schooling will be significant, and thus the long-term impact on GDP will be larger than in other regions of the world. In sum, if initial expectations about the impact of this crisis on Africa may have been too pessimistic, today we should be concerned that the international community has not recognized the potential long-term implications of the pandemic for Africa.

31 https://cepi.net/COVAX/; accessed February 25, 2021.

32 https://ourworldindata.org/grapher/full-list-cumulative-total-tests-per-thousand-map?stackMode=absolute&time=latest&region=World; accessed February 25, 2021.

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THE ARAB MAGHREB UNION: REGIONALIZATION WITHOUT INTEGRATION

Leila Baghdadi, Zouhour Karray, and Chahir Zaki

Photo by Victor Puente/Pexels

Chapter 6

INTRODUCTION

The 2014 Malabo Declaration is a recommitment to the Comprehensive Africa Agriculture Development Programme (CAADP) principles adopted by African Union Heads of State and Government. It calls for tripling intra-African trade in agricultural goods and services through improved trade integration at the regional level. In view of the important role of Africa's regional economic communities (RECs) in promoting intra-African trade, each year the Africa Agriculture Trade Monitor (AATM) features one of the RECs and analyzes the structure of its trade, its partners, and how to improve its integration. In 2019, the featured REC was the Common Market for Eastern and Southern Africa (COMESA), and in 2020, the Southern African Development Community (SADC). This year, the AATM focuses on the Arab Maghreb Union (AMU), which includes five countries — Algeria, Libya, Mauritania, Morocco, and Tunisia.

The AMU is interesting for several reasons. First, despite a long history of regional agreements, integration among the AMU countries is rather low (Kahouli and Maktouf 2015). The Union was established in 1989 and a larger trade agreement, the Pan-Arab Free Trade Agreement (PAFTA),[1] was signed in 1998. However, trade and investment flows between the countries of AMU and PAFTA remain low. Second, despite their geographic proximity and cultural similarities, AMU countries have failed to become deeply integrated (Abdullah et al. 2014). Third, some of the AMU countries are involved in other trade agreements (such as the Agadir Agreement, the European Association Agreements, and COMESA) that create additional trade costs because of differing regulations, regimes, and standards (referred to in the trade literature as a "spaghetti bowl"). Given this complexity, it is important to investigate whether such agreements are complementary to the AMU agreement, or displace it.

Against this background, this chapter has three objectives. First, it analyses the composition and structure of export flows from the AMU countries, by product and by partner, with a special focus on agricultural products (including agrifood products). Second, it attempts to assess the untapped export potential for products and for destination markets. Third, it analyses factors that help explain why the AMU regional bloc has not led to deep integration.

The remainder of the chapter is organized as follows: The next section provides a historical overview of the AMU. This is followed by an analysis of the region's trade flows (intra- vs. extra-regional trade flows). We then explore the untapped potential of the AMU's main markets and export products. The following section discusses the factors that have hindered the integration of the AMU countries, and the final section concludes.

HISTORICAL BACKGROUND

The Maghreb is the Arabic name for the northwest part of Africa, generally including Algeria, Libya, Mauritania, Morocco, and Tunisia. It comprises almost 6 million square kilometers and 100 million people. The Maghreb countries are strategically located, with the dynamic European countries across the Mediterranean Sea to the north and emergent African economies to the south. The Maghreb countries have common historical, cultural, and language ties but are diverse in terms of economic and political structures. Some are labor-poor and resource-rich (Libya), others are both labor-abundant and resource-rich (Algeria), or labor-abundant but resource-poor (Morocco, Tunisia, Mauritania). They have a variety of political systems, with a kingdom in Morocco, democracy in Mauritania, a decade of ongoing political reforms moving toward a strong democracy in Tunisia, and a decade of political unrest and continued conflict in Libya. However, they face common threats including climate change, water scarcity, and terrorism, among others.

1 PAFTA includes 17 Arab countries.

Interest in creating a free trade agreement among Maghreb countries emerged in the post-independence period, when the nationalist parties in Morocco and Tunisia, together with the National Liberation Front of Algeria, held the 1958 Maghreb Unity Congress in Tangier. In 1964, the first Conference of Maghreb Economic Ministers took place in Tunis and established the Permanent Consultative Committee of the Maghreb including Algeria, Libya, Morocco, and Tunisia. The Committee was charged with coordinating and harmonizing the development plans of these countries and their intraregional trade and relations with Europe (Finaish and Bell 1994). At the first Maghreb summit, held in 1988, the five Maghreb countries — Algeria, Libya, Mauritania, Morocco, and Tunisia — met to discuss forming an economic union. Also in 1988, the leaders of the Maghreb countries created the Maghreb High Commission with the declaration of Zeralda as well as various specialized commissions to help achieve unity in the region.

These five countries signed the Marrakech treaty to establish the AMU in 1989, with the aim of boosting cooperation and dialogue and improving economic growth in the region.[2] The treaty's 19 articles aim to increase the integration of AMU in economic, cultural, and defense areas. In particular, the treaty defined a series of steps for deepening trade relations: first, the establishment of a free trade area with the dismantlement of tariff and nontariff trade barriers among member countries; second, the creation of a customs union with a common external tariff vis-à-vis the rest of the world; and finally, the creation of a common market with free movement of factors of production across national borders of member countries. It is important to note that although the five countries have signed more than 30 multilateral agreements, all Union members participate in only five agreements. These are on trade and tariffs covering all industrial products; trade in agricultural products; investment guarantees; avoidance of double taxation; and phytosanitary standards.

The large gains foreseen from AMU economic integration have not materialized. As of 2020, intraregional trade among AMU countries still accounted for less than 5 percent of AMU's total trade, for several reasons. First, all AMU decisions must be unanimously agreed upon and implemented. Second, political divergence on some issues, such as the Western Sahara conflict between Algeria and Morocco, halted AMU meetings in 1994. The Union's goals have also been undermined by conflicts and terrorism threats since the treaty was signed, including the "Black Decade" in Algeria in the 1990s, a decade of political transition resulting in the disruption of the state in Libya in the 2010s, and ongoing political and social unrest in Tunisia since 2010. Together these have led to mediocre growth in the region.

AMU integration is also held back by several economic factors, including restrictive trade and investment policies, tariffs and nontariff barriers, and low infrastructure connectivity among AMU countries (Kireyev et al. 2018). Nontariff barriers are quite significant, with border compliance costs for exports and imports among the highest in the world. Moreover, regional infrastructure and logistics for intraregional trade are poor. For instance, although all AMU countries have ports, there are few intraregional commercial shipping lines. These countries have looked toward Europe in shaping their trade regimes and are better connected to Europe than to other AMU countries, as is described in this chapter. The theoretical explanation for this has been highlighted by Anderson and van Wincoop (2004) who argue that relative trading costs matter more than absolute ones, and countries surrounded by large trading economies, such as European economies in the case of AMU countries, will trade less between themselves than if they were geographically isolated.

In overlooking their own intraregional trade potential, the AMU countries have missed significant opportunities. As a result, the possibility of becoming a value-chain hub for trade and investment between Europe and Africa remains a dream. This lack of regional integration is, in turn, reducing their integration in global value chains (Kireyev et al. 2018).

2 See the AMU official website, https://maghrebarabe.org/

Interestingly, while complex trade regulations hinder formal trade among AMU countries, they are also fueling informal intraregional trade. Price differences across countries resulting from various distortions have created opportunities that informal entrepreneurs are seizing (Timmis 2017).

TRENDS AND STRUCTURE OF AGRICULTURAL TRADE

Overview of AMU agriculture and trade

A well-functioning agriculture and agrifood sector is of paramount importance for developing countries — it not only ensures food security but also provides a source of national income. Trade in agricultural products can contribute to regional integration and the development of regional value chains. Participation in value chains, in turn, contributes to the growth of the entire agriculture and agrifood sector, and thus increases national income.

Over the period 2000–2019, the average contribution of the agriculture sector to GDP in AMU countries ranged from 2.7 percent in Libya to 19.1 percent in Mauritania (Figure 6.1a). For the industrial sector, the highest share has been in Libya (79 percent), reflecting its large energy sector, and the lowest in Morocco (25.9 percent). The contribution of services to GDP stands at around 50 percent for all countries. Focusing on the contribution of agriculture to GDP for the AMU countries, Figure 6.1b shows that during the 2003–2019 period, the share of the agriculture sector in the GDP of Algeria, Morocco, and Tunisia varied between 10 and 15 percent. In contrast, in Mauritania, where the industrial sector is underdeveloped, agriculture's contribution ranged between 15 and 25 percent. These results also show that the industrial and service sectors play a more important role than agriculture in the AMU economies. For this reason, according to the Global Food Security Index, established by the Economist Intelligence Unit, these countries have an index of around 62 (classified as "good"), meaning that they are relatively food secure but still face some risks. Indeed, because of the region's water stress, these countries perform relatively poorly in terms of food availability and resilience (Figure 6.2). They perform slightly better in terms of food quality and safety as well as affordability.

Figure 6.1a Sectoral contributions to GDP, 2000–2019 average (%)

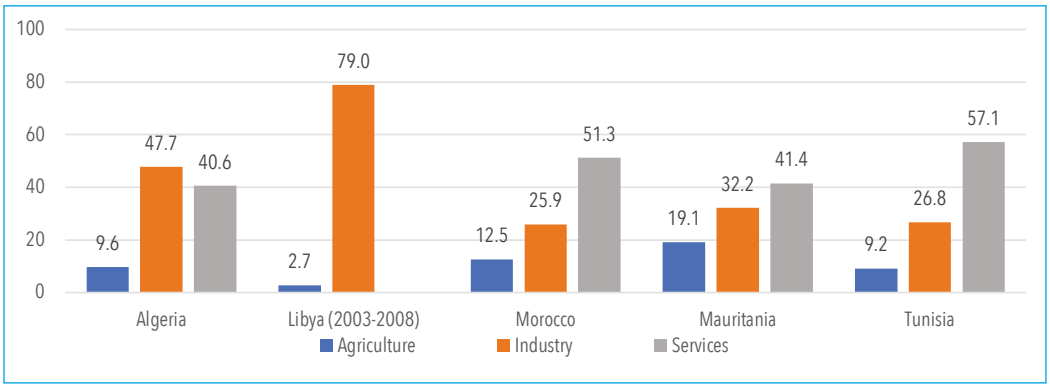
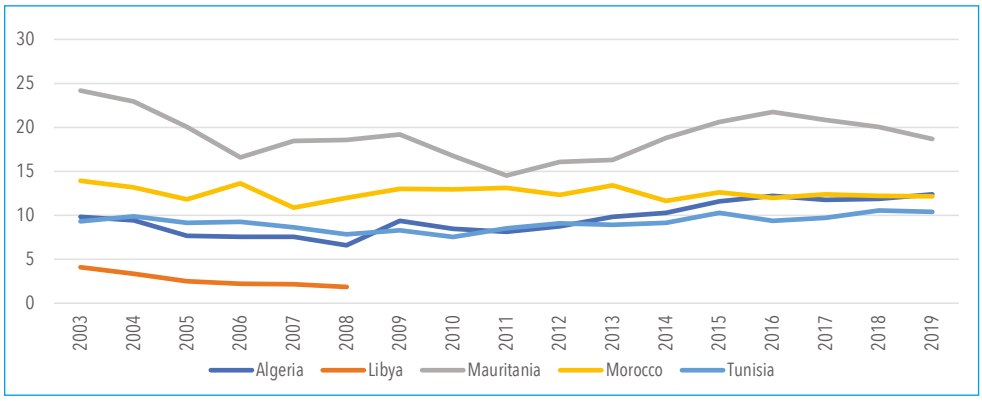
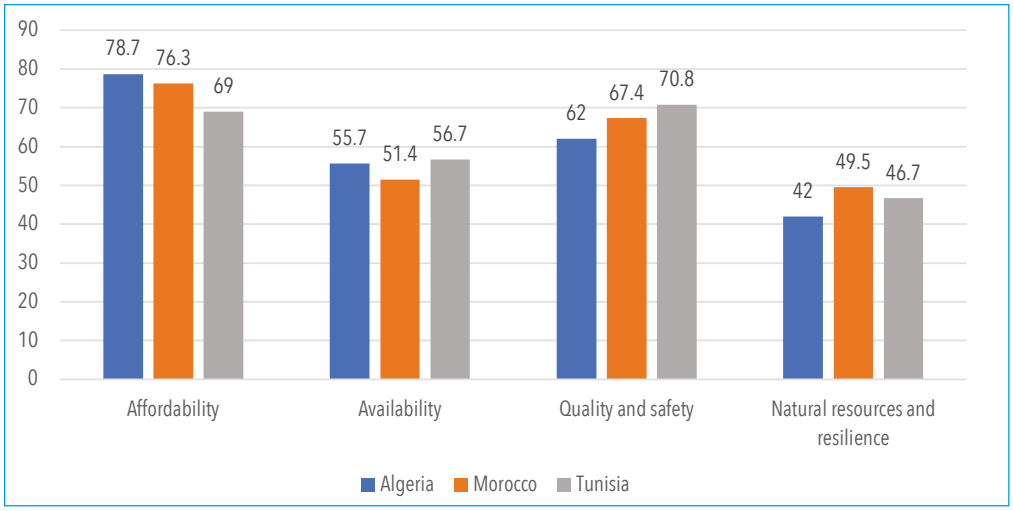


Figure 6.1b Agriculture value added, 2003–2019 (% of GDP)



Source: Based on World Development Indicators data.

Figure 6.2 Global Food Security Index, 2019



Source: Constructed using the Global Food Security Index dataset.
Note: (i) Affordability measures the ability of consumers to purchase food, their vulnerability to price shocks, and the presence of programs and policies to support customers when shocks occur. (ii) Availability measures the sufficiency of the national food supply, the risk of supply disruption, national capacity to disseminate food, and research efforts to expand agricultural output. (iii) Quality and Safety measures the variety and nutritional quality of average diets, as well as the safety of food. (iv) Natural Resources and Resilience assesses a country's exposure to the impacts of a changing climate and natural resource risks and how the country is adapting to these risks that affect food security. (v) The higher the index, the more food secure a country is. The ranges of the index are as follows: very good (80–100), good (60–79.9), moderate (40–59.9), weak (20–39.9), and very weak (0–19.9) (https://foodsecurityindex.eiu.com/Home/Methodology).

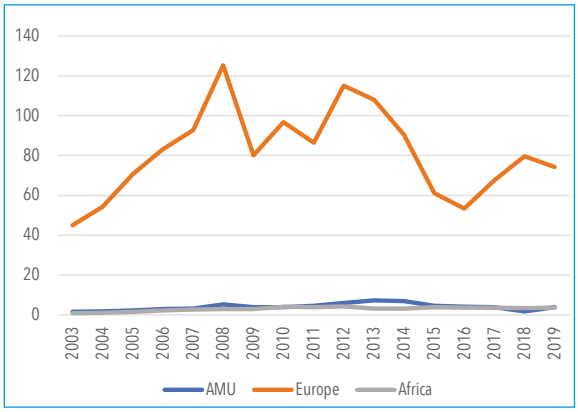
Figure 6.3 shows AMU trade flows to its main partners: Europe[3] (its largest trading partner), Africa (excluding AMU countries), and AMU countries. Panel (a) shows export values from the AMU countries to partner regions from 2003 to 2019. AMU exports to Europe are substantially larger than both exports to African countries (excluding AMU countries) and AMU intraregional exports. Exports to Europe rose steadily from 2003 to a peak in 2008 of US$120 billion,[4] and then rose again after 2009, but without reaching the pre-2008 levels. This drop-off in exports to Europe reflects the long-term consequences of the 2008–2009 financial crisis. AMU exports to Africa and within the AMU remained relatively stable but low during the 2003–2019 period, never exceeding $10 billion.

3 Most AMU countries have signed free trade agreement with the European Union (EU). In 2019, data from the International Trade Center show that 59 percent of AMU's goods exports go to the EU.

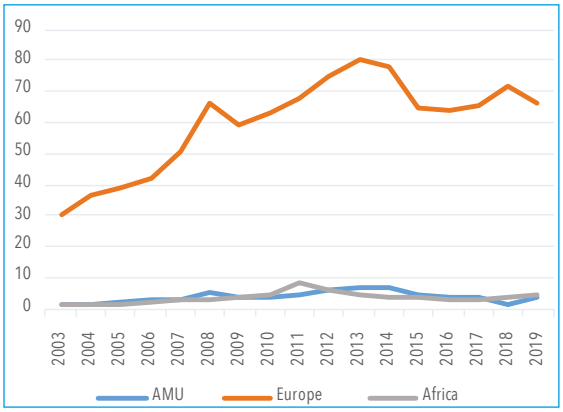
4 Throughout this chapter, "$" refers to US dollars unless otherwise noted.

Figure 6.3 AMU trade flows of goods by region

(c) AMU exports (current US$ billions)



(b) AMU imports (current US$ billions)



Source: Constructed from 2021 AATM database.

Panel (b) shows import values for AMU countries from 2003 to 2019. Imports from Europe are higher than those from Africa (excluding AMU countries) and higher than those from intra–AMU trade. Imports from Europe increased during the 2003–2019 period, while imports from Africa (excluding AMU) and from within AMU remained stable.

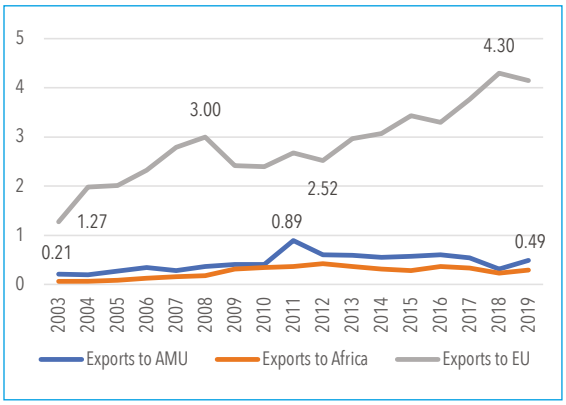
Intraregional and extra-regional flows

Intraregional vs. extra-regional trade flows

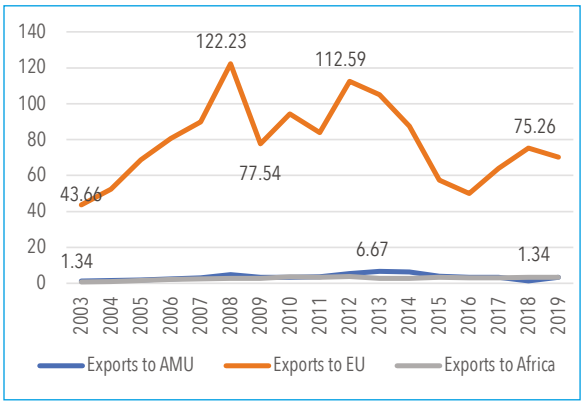
Figure 6.4 presents the evolution of agricultural and nonagricultural exports from the five AMU countries to the main trading bloc partners, namely the AMU, Africa (excluding the AMU countries), and the European Union (EU). Exports to the EU account for the largest share of total AMU exports (both agricultural and nonagricultural products). The various Association Agreements and free trade agreements signed between the EU and each of the AMU countries have made the EU the main destination for AMU exports. Moreover, AMU exports of agricultural products to the EU grew fairly steadily, from $1.27 billion in 2003 to $4.30 billion in 2019.

Figure 6.4 Evolution of AMU countries' exports of agricultural and nonagricultural products, 2003–2019 (US$ billions)

(a) Agricultural products



(b) Nonagricultural products

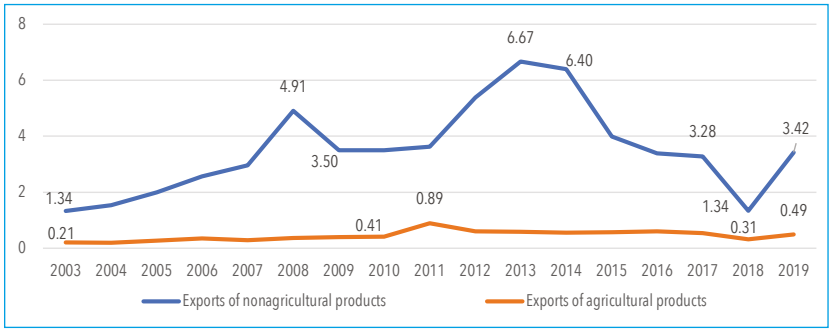


Source: Constructed from the 2021 AATM database.

Analysis of all intra–AMU trade flows (Figure 6.5) shows that, within the AMU, trade of nonagricultural products is larger than trade of agricultural products. Although the agriculture and agrifood sectors comprise 10 to 20 percent of GDP in the region, regional agricultural trade flows remain rather limited. Moreover, the volume of intraregional trade in both agricultural and

nonagricultural products has been unsteady. Fluctuations in agricultural exports are positively related to the annual harvest in the country of origin and negatively related to that of the country of destination. For example, the reduction in Tunisia's olive oil exports from US$784.2 million in 2018 to $466.5 million in 2019 is related to the poor harvest in that year, while a better harvest put Tunisia first among olive-oil exporting countries (by volume) in 2020.

Figure 6.5 Evolution of trade among the AMU countries, 2003–2019 (US$ millions)

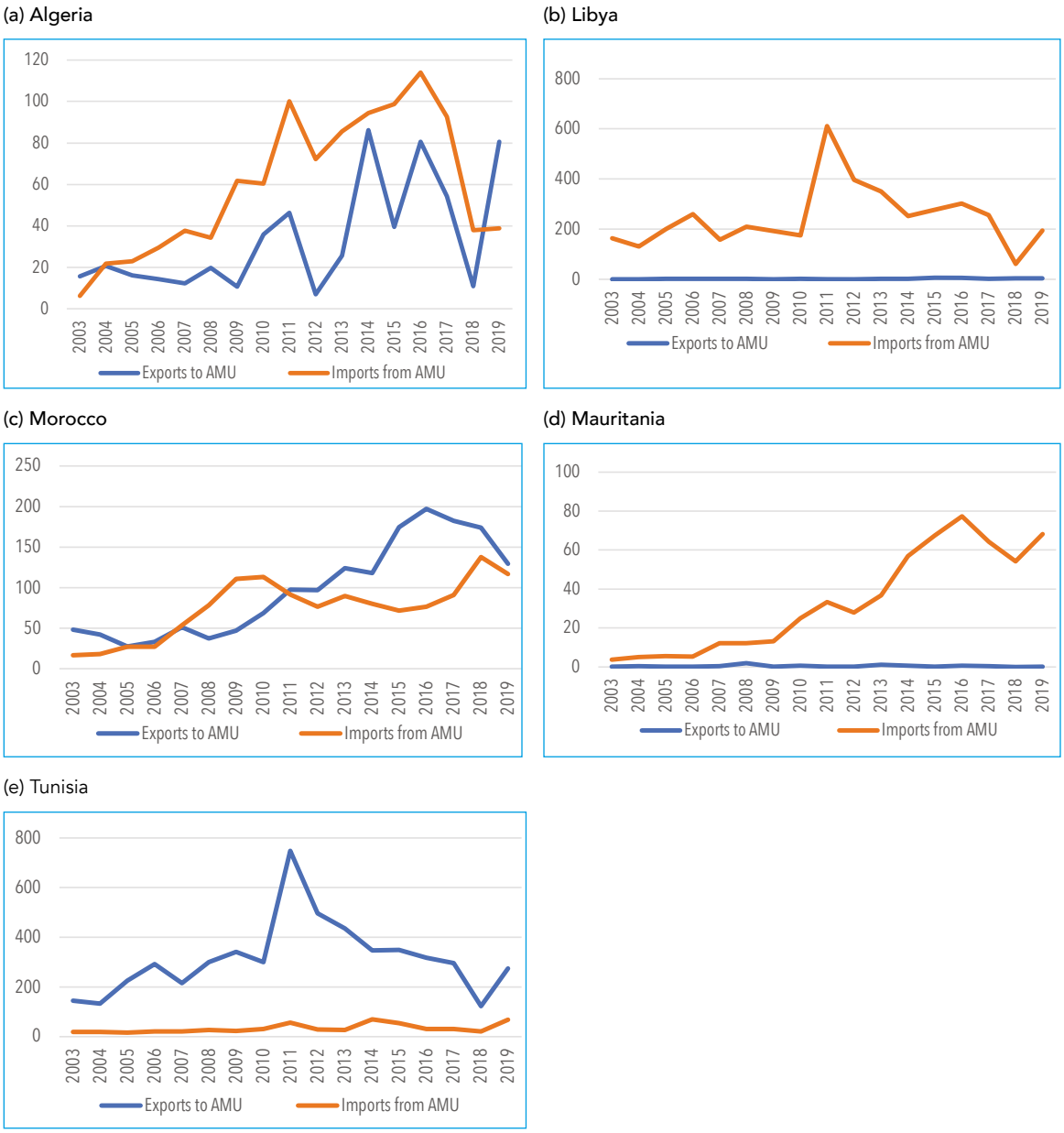


Source: Constructed from the 2021 AATM database.

Heterogeneity of AMU Members

The analysis of agricultural trade among the five AMU countries (Figure 6.6) shows national variations. Within the region, Libya and Mauritania are primarily importers, Algeria and Morocco both export and import agricultural products, and Tunisia is primarily an exporter. However, while this pattern is consistent, the volume of imports and exports for each country is volatile, related to the success of annual harvests in each country as well as to productivity. While Libya and Mauritania mainly import agricultural products, their exports to the other AMU countries are negligible; Algerian exports of agricultural products are also quite low. Morocco and Tunisia are the only AMU countries exporting agricultural products within the region. In terms of trade balances, Tunisia is the only country that had a positive trade balance with the AMU throughout the 2003–2019 period. Morocco's intraregional exports began to exceed imports only in 2012. Of note is that Tunisia's exports of agricultural products exactly track Libya's imports from 2003 to 2019, confirming that Libya imports agricultural products almost exclusively from Tunisia. Similarly, the evolution of Morocco's exports appears to be correlated with Mauritania's imports.

Figure 6.6 Intra–AMU trade in agricultural products, 2003–2019 (US$ millions)



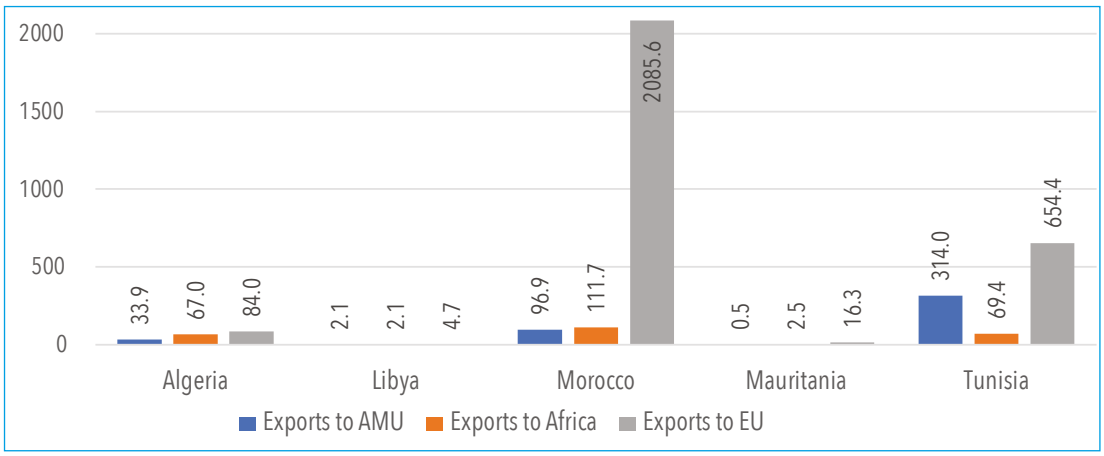
Source: Constructed from the 2021 AATM database.

To better understand the agricultural trade among the AMU countries, we use the average of exports and imports for the period 2003–2019; the average is preferred because annual production, and consequently exports of agricultural products, are quite variable and subject to rainfall and climatic conditions. Looking at the individual AMU country averages of agricultural exports and imports (Figures 6.7 and 6.8) to the main regional blocs (AMU, Africa, and the EU) shows that:

- Tunisia and Morocco are the main exporters of agricultural products; and their exports are mainly destined to the EU.
- Tunisia is the main exporter of agricultural products to other AMU countries, particularly to its neighbor Libya.
- The agricultural products trade of the five countries within the AMU is comparable to that with all other African countries.

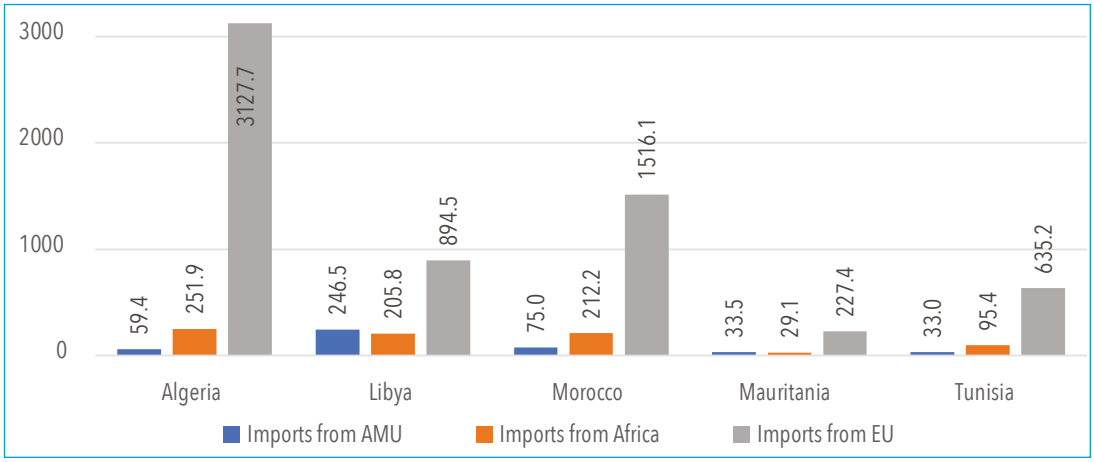
- Algeria, Morocco, Libya, and Tunisia import agricultural products primarily from the EU.
- Apart from Tunisia's exports to Libya, agricultural products trade among the AMU countries is quite low. The EU is the main destination for AMU countries' exports of agricultural products and their imports are also mainly from the EU.

Figure 6.7 Agricultural exports to AMU, Africa, and EU, 2003–2019 average (US$ millions)



Source: Constructed from the 2021 AATM database.
Note: Africa excludes the AMU countries.

Figure 6.8 Agricultural imports from the AMU, Africa, and EU, 2003–2019 average (US$ millions)



Source: Constructed from the 2021 AATM database.
Note: Africa excludes the AMU countries.

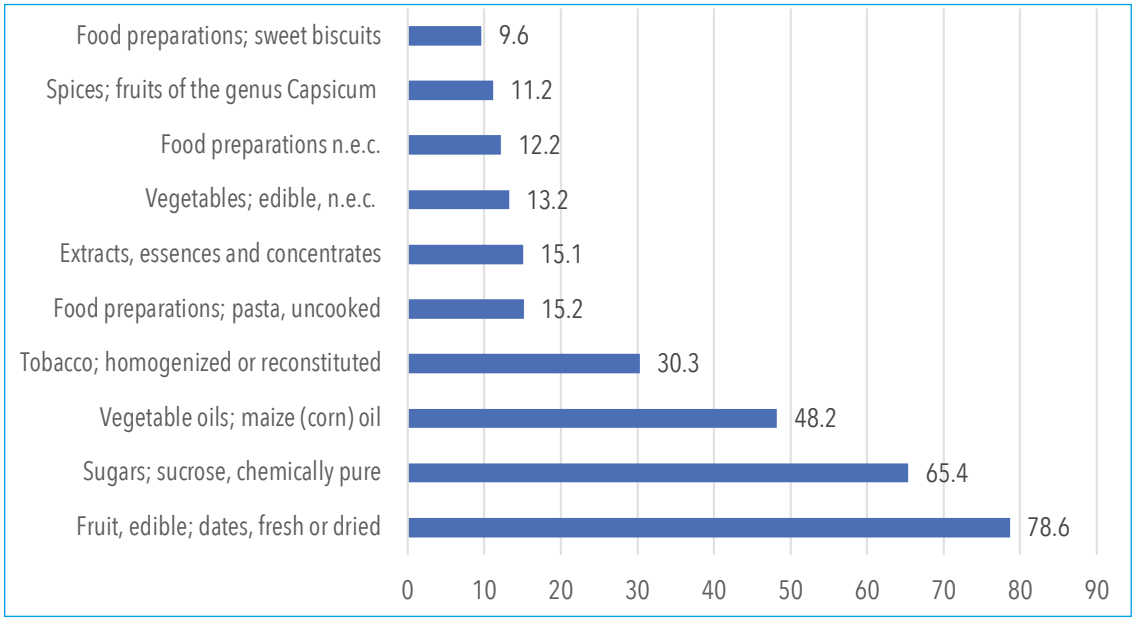
In summary, for all Maghreb countries, trade in agricultural products is carried out mainly with EU countries. Trade between Maghreb countries remains rather limited. Indeed, the various association and free trade agreements signed between the EU and the Maghreb countries have been a driving force for the development of agricultural trade, despite their primary focus on nonagricultural products. Similarly, constraints related to transport infrastructure and logistics chains appear to be an obstacle to the development of agricultural trade among Maghreb countries (discussed in depth later in this chapter). Logistics and infrastructure bottlenecks are more important for South–South trade than for North–South trade.

Agricultural products exported and imported by AMU members

Top 10 exported and imported agricultural products

Intraregional flows refers to trade flows within the AMU region. In intraregional trade, the top 10 traded agricultural products (at the HS6 level) from AMU countries are dates (fresh and dried), followed by sugar, maize oil, tobacco, and pasta (Figure 6.9). Average exports of dates reached $78.64 million in 2003–2019, and dates appear to be one of the top two exported agricultural products for Algeria and the top exported agricultural product for Tunisia, Mauritania, and Libya. Sugar is Algeria's top export and among the top three products exported by Morocco and Tunisia.

Figure 6.9 Top 10 agricultural products traded within the AMU, average exports 2003–2019 (current US$ million)

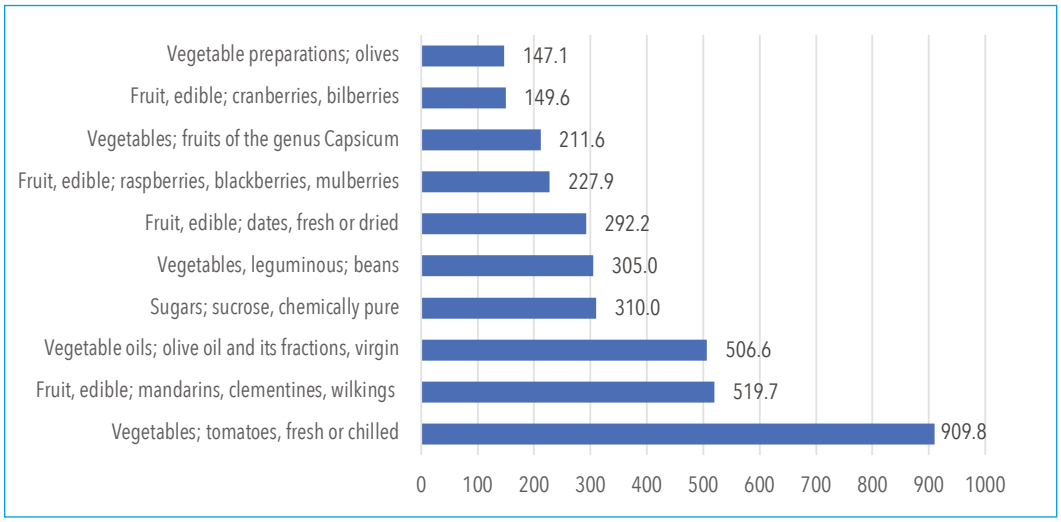


Source: Constructed from the 2021 AATM database.

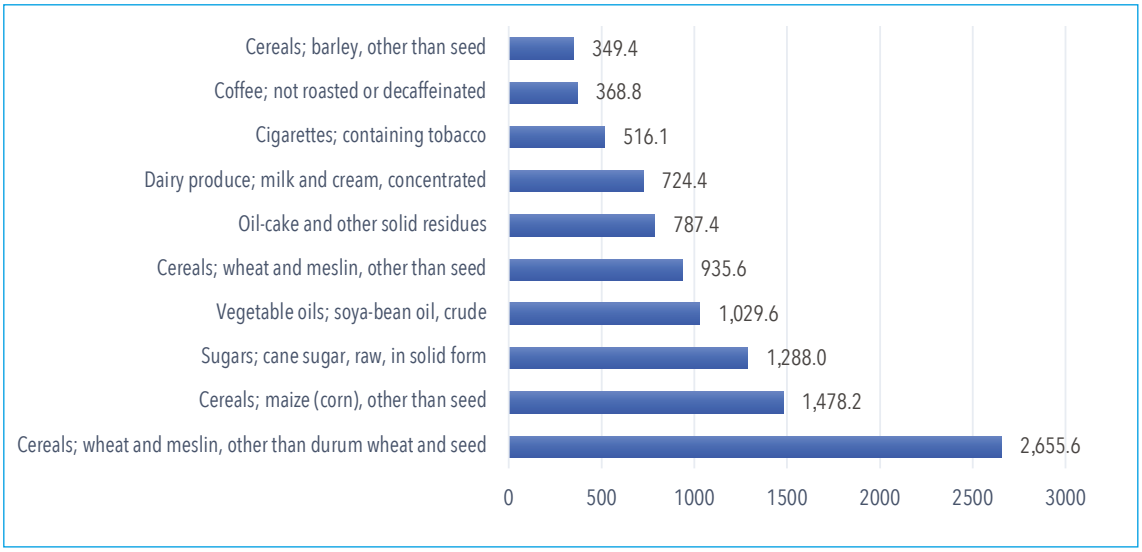
Extra-regional flows refers to trade flows between the AMU countries and the rest of the world. Figure 6.10a shows the top 10 agricultural products exported from AMU countries to other regions. Tomatoes are the largest extra-regional agricultural export, followed by mandarins and olive oils. The top 10 agricultural products imported by AMU countries from non-AMU countries are wheat and meslin, maize, cane sugar, and soybean oils.

Figure 6.10 Top 10 agricultural products traded by AMU countries with extra-AMU countries

(a) Average exports 2003–2019 (current US$ million)



(b) Average imports 2003–2019 (current US$ million)



Source: Constructed from the 2021 AATM database.

UNTAPPED POTENTIAL

The data presented above show that there are opportunities to develop trade in agricultural products both among the five AMU countries and with other trade partners.

To determine the export potential for each country, we use the export potential indicator constructed by Decreux and Spies (2016). This helps to identify the exporter's unrealized potential export value for a given product in a given target market as follows:

$$Unrealized\ potential_{ijk} = EP_{ijk} - \min(v_{ijk}, EP_{ijk})$$

where EP is the export potential from country i of product k to country j, and v corresponds to observed exports from exporter i of product k to market j. In case of $v_{ijk} \geq EP_{ijk}$, the unrealized potential equals zero. It is important to note that the EP variable is estimated using a gravity model that takes into consideration supply characteristics of the exporting country, demand characteristics in the importing country, and ease of trade between the two countries i and j.

The top 10 destinations that have an untapped potential are chiefly either European countries or the United States (Table 6.1). A few exceptions can be observed: Tunisia has a modest potential in Libya ($181 million), in Algeria ($198 million), and in Morocco ($187 million); Libya has some potential in Morocco ($8 million) as does Algeria ($31 million); and Algeria has export potential in Tunisia ($22 million). However, for Morocco and Mauritania, none of the AMU countries appears among the top 10 destinations with an export potential. Thus, while Morocco could be a potential market for other AMU countries, Tunisia has the most potential as an exporter within the region.

Compared to the untapped potential for exports to European countries, the potential for expanding exports to AMU counties is clearly low, given the countries' existing structural characteristics. If these countries are to boost their intraregional trade flows, structural reforms are needed to better link trade policy to industrial policy, to improve the competitiveness of exports, and to facilitate intraregional flows of foreign investment.

Table 6.1 Actual and untapped export potential by destination (US$ millions)

	Tunisia		Libya		Mauritania		Morocco		Algeria	
Actual	France	4400	Turkey	42	Spain	303	France	5700	France	286
Untapped		*1900*		*19*		*42*		*2000*		*172*
Actual	Germany	1800	Italy	30	Côte d'Ivoire	136	Spain	6600	Spain	242
Untapped		*1100*		*15*		*90*		*1400*		*88*
Actual	Italy	2200	Egypt	25	China	90	USA	1200	Brazil	164
Untapped		*809*		*6*		*122*		*1100*		*40*
Actual	Spain	548	France	18	Japan	130	Germany	1000	USA	116
Untapped		*293*		*18*		*101*		*654*		*51*
Actual	USA	354	USA	17	Cameroon	72	Italy	1100	Italy	80
Untapped		*263*		*14*		*34*		*685*		*49*
Actual	Libya	454	Malta	10	Ghana	71	India	728	Tunisia	62
Untapped		*181*		*10*		*27*		*368*		*22*
Actual	Algeria	384	Spain	11.5	Turkey	34	UK	763	Morocco	52
Untapped		*198*		*8*		*50*		*493*		*31*
Actual	Belgium	243	Norway	8.5	Nigeria	41	Brazil	741	Nether-lands	43
Untapped		*255*		*6*		*35*		*234*		*46*
Actual	Morocco	212	Morocco	11	Angola	66	Nether-lands	552	Germany	40
Untapped		*187*		*8*		*3*		*496*		*33*
Actual	Nether-lands	201	Japan	8	Rep. of Korea	34	Turkey	564	Portugal	37
Untapped		*208*		*10*		*28*		*401*		*41*

Source: Export Potential dataset developed by the International Trade Centre (2019).
Note: (i) The Export Potential Indicator identifies the potential export value for any exporter in a given product and target market based on a gravity model that combines the exporter's supply with the target market's demand, market access conditions, and the bilateral links between the two countries.
(ii) The calculations are made for all products (agriculture and nonagriculture).

At the sectoral level, the International Trade Centre shows also that, among the 10 most important sectors, there are some agriculture sectors that have export potential (ITC 2019). For instance, fish and shellfish is a key sector for all AMU countries except Tunisia. In the case of Mauritania, fishing accounts for 4 to 10 percent of GDP, depending on the year, and for 35 to 50 percent of exports (Marti 2018). In Morocco, fisheries contribute 2.3 percent to GDP, with an estimated 3 million people who depend on fisheries for their livelihoods. Among the other sectors, fruits rank second for Algeria, Libya, Morocco, and Tunisia, and food products rank third for Tunisia. While this untapped potential is low in oil-dependent countries (notably Algeria and Libya), it is significantly higher in Tunisia and Morocco. Sectors with potential (such as sugar and fruits in Algeria and fish and fruits in Libya) merit a more detailed analysis to help make them more competitive at the global level.

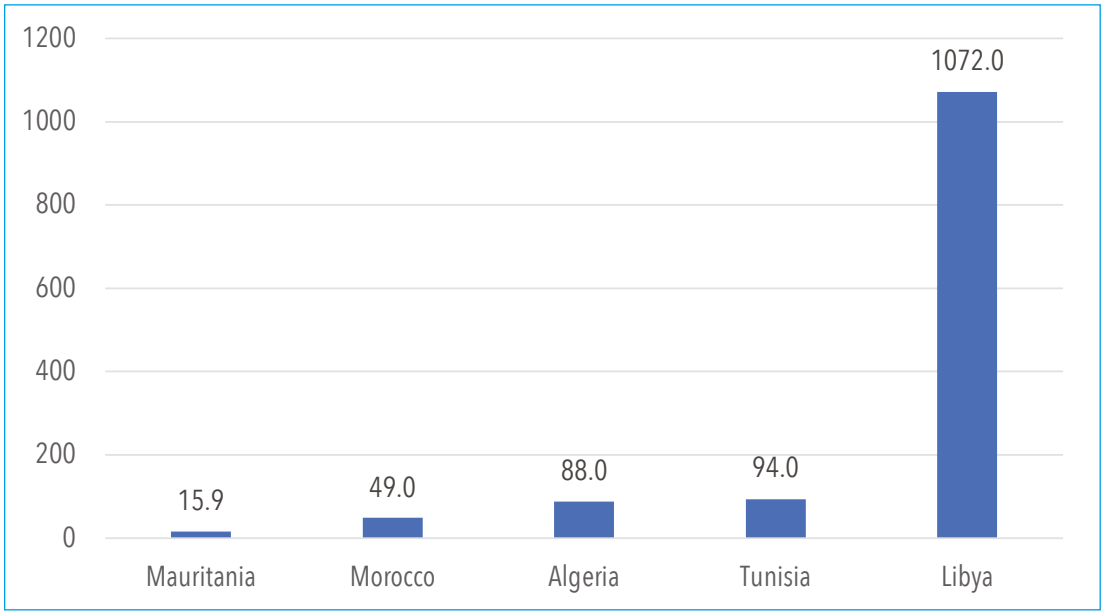
It is important to note that the untapped export potential should be perceived as a dynamic process. Indeed, several products depend on water availability and an adequate climate. Given the water stress and climate change impacts that North Africa is facing, these countries may need to change and/or adapt their specialization. Indeed, the level of water stress in these countries, while heterogeneous (ranging from 15.9 in Mauritania to 1072 in Libya, see Figure 6.11), is generally high compared with other agricultural countries such as Brazil (whose index is 1.32) and China (29.8). The availability of freshwater has decreased in the region by 60 percent over the past 40 years, and the poor maintenance of the water network and inadequacy of wastewater treatment plants may affect the specialization of AMU countries. Given these challenges, hydroponic production may be a good option in the future, since it requires 90 percent less water than conventional agriculture (Pandey et al. 2009).

Table 6.2 Actual and untapped export potential by sector (US$ millions)

		Sector 1		Sector 2		Sector 3	
Algeria	Actual	Sugar	230	Fruits	87	Fish and shellfish	23
	Untapped		*87*		*84*		*23*
Libya	Actual	Fish and shellfish	30	Fruits	2.9	Skins, leather and products	5.5
	Untapped		*40*		*5.8*		*4.6*
Mauritania	Actual	Fish and shellfish	1000	Veg. residues, animal feed	150	Fish products	63.4
	Untapped		*500*		*110*		*40.2*
Morocco	Actual	Fish and shellfish	1300	Fruits	1300	Fish products	800
	Untapped		*1100*		*800*		*520*
Tunisia	Actual	Vegetable oils and fats	670	Fruits	310	Food products	150
	Untapped		*560*		*270*		*160*

Source: Export Potential dataset developed by the International Trade Centre (2019).
Note: (i) The Export Potential Indicator identifies the potential export value for any exporter in a given product and target market based on a gravity model that combines the exporter's supply with the target market's demand, market access conditions, and the bilateral links between the two countries.
(ii) Sectors are ranked based on their observed exports.

Figure 6.11 Level of water stress, 2014



Source: World Development Indicators.
Note: Level of water stress is measured by freshwater withdrawal as a proportion of available freshwater resources.

WHY HAS THE AMU NOT ACHIEVED ITS OBJECTIVE?

The AMU's main objective is to promote regional integration, but its success has been limited. Table 6.3 presents the scores from the Africa Regional Integration Index (ARII) for 2019. The Index considers 16 indicators, grouped by five dimensions (trade integration, productive integration, macroeconomic integration, infrastructural integration, and free movement of people), to measure how well each country and region in Africa is integrated with its neighbors. ARII also measures the state of regional integration for the continent as a whole.

Table 6.3 AMU scores on the Africa Regional Integration Index, 2019

	Algeria	Libya	Mauritania	Morocco	Tunisia	Average AMU
ARII - AMU	0.547	0.307	0.255	0.550	0.780	0.488
Performance	average	low	low	average	high	
Scores by dimensions of regional integration						
Trade integration	0.507	0.390	0.253	0.465	0.790	0.481
Productive integration	0.604	0.211	0.000	0.632	0.795	0.449
Macroeconomic integration	0.404	0.167	0.667	0.998	0.623	0.571
Infrastructural integration	0.550	0.561	0.000	0.526	0.906	0.509
Free movement of people	0.665	0.000	0.750	0.111	0.665	0.438

Source: Constructed from the Africa Regional Integration Index Report 2019.
Note: Scores are calculated on a score of 0 (low) to 1 (high).

The AMU is moderately integrated, with an average score of 0.488. In comparison with other RECs, it is relatively weak on the "free movement of persons" dimension but performs relatively well in terms of integrative macroeconomic policies. The AMU trade score (0.481) is moderate, reflecting low intra–AMU exports. The AMU average score for "productive integration" is 0.449, but the scores of member countries vary considerably, ranging from close to zero for Mauritania to 0.796 for Tunisia. Tunisia is also the AMU leader in "infrastructure integration" (0.906), with good air-links in the region. In contrast, Algeria, Morocco, and Libya are grouped around a score of 0.550, and Mauritania gets a score of zero. In summary, Tunisia and Morocco are the best performers in terms of regional integration, and Mauritania and Libya are the poorest performers.

Five main constraints, discussed below, hinder AMU integration. These include trade policy factors (tariffs and nontariff measures), institutional factors, and behind the borders factors.

The spaghetti bowl of North African agreements

The main objective of the AMU free trade agreement is to promote intraregional exchanges and to strengthen the region economically. Nevertheless, current intra–AMU trade (Figures 6.6 and 6.7), as well as export potential among AMU countries, is limited in comparison with its trade with other regions. One factor behind the limited regional trade development is that, in parallel with the AMU free trade agreement, most AMU countries — Tunisia, Morocco, Mauritania, and Algeria — also signed multiple bilateral, regional, and multilateral economic cooperation and free trade agreements (Table 6.4). These various agreements are in addition to their membership in the World Trade Organization (WTO). Because these multiple bilateral and regional agreements overlap, they have been dubbed a "spaghetti bowl."

Given the specific provisions and measures for agricultural products in each agreement (including phytosanitary control, procedures, and so on), as well as tariff and nontariff measures, management of parallel agreements becomes complex and time-consuming. Countries that are party to each free trade agreement agree on a reduced internal tariff to be applied among themselves; at the same time, each member can levy its own tariff on imports from nonmember countries. Because of this, the concept of "rules of origin" comes into play to distinguish products from one country from those from another. It can be difficult for producers to comply with all the rules of origin simultaneously, especially when these differ substantially across these free trade agreements. For countries with limited institutional capacity for compliance, dealing with rules of origin can be particularly onerous. Thus, the spaghetti-bowl effect of trade agreements tends to increase trade costs, resulting in a slowing down and diversion of trade in both agricultural and nonagricultural products among AMU countries. Many empirical studies (Sorgho 2016; Baldwin 2006) show that, rather than promoting trade, the multiplication of regional trade agreements may instead result in trade diversion effects, because of higher transaction costs caused by a tangle of overlapping rules.

Table 6.4 Major free trade agreements of the AMU countries

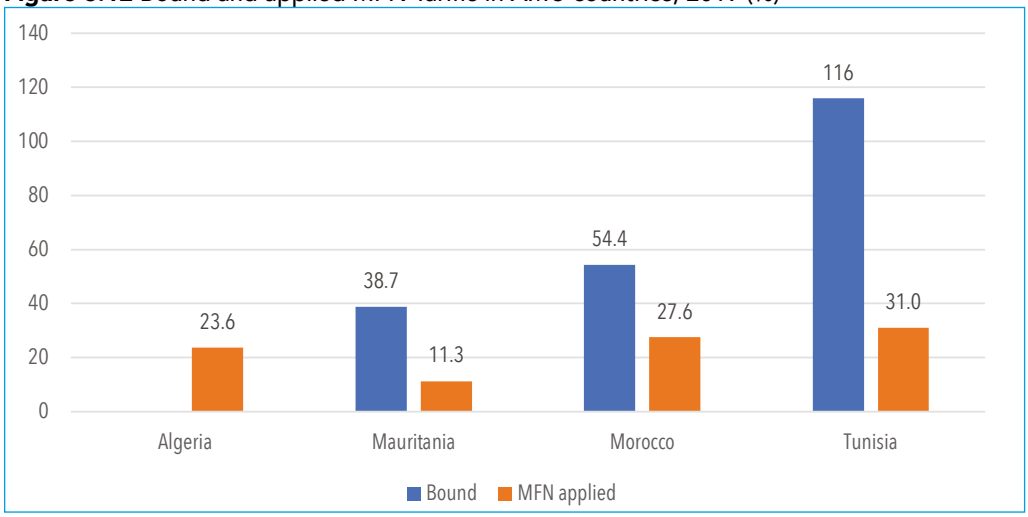
Country	Bilateral free trade agreement	Regional free trade agreement – within Africa	Regional free trade agreement – outside Africa
Algeria	Jordan, Mauritania, Tunisia	AMU, AfCFTA	EU-Algeria Association Agreement, PAFTA
Libya	Jordan, Morocco, Tunisia	AMU, COMESA, AfCFTA	PAFTA
Morocco	China, Egypt, United Arab Emirates, Jordan, Libya, Tunisia, Turkey, USA	AMU, AfCFTA	EU-Morocco Association Agreement, PAFTA, Agadir Agreement
Mauritania	Algeria, China, Gambia, Kuwait, Morocco, Qatar, Tunisia, Turkey, Sudan	AMU, AfCFTA	Economic Partnership Agreement with the EU
Tunisia	Algeria, Egypt, Iraq, Jordan, Kuwait, Libya, Mauritania, Morocco, Palestine, Senegal, Syria, Sudan, Turkey	AMU, AfCFTA, COMESA	EU-Tunisia Association Agreement, PAFTA, Agadir Agreement

Source: Constructed using the databases of the Ministries of Commerce of the different AMU countries.
Note: AfCFTA = African Continental Free Trade Area; AMU = Arab Mahgreb Union; COMESA = Common Market for Eastern and Southern Africa; PAFTA = Pan-Arab Free Trade Area.

Tariff structure

Generally, there is a large gap between bound tariffs (the highest tariffs permitted) and the applied most favored nation (MFN) tariffs for all AMU countries in the agriculture sector. Figure 6.12 shows that the bound tariff of Tunisia is the highest (116 percent), followed by Morocco (54.4 percent) and Mauritania (38.7 percent). MFN tariffs are lower (31 percent, 27.6 percent, and 11.3 percent, respectively). Clearly, this large gap between the bound and applied rates (called the binding overhang) makes a country's trade policies less predictable, which affects trade performance.

Figure 6.12 Bound and applied MFN Tariffs in AMU countries, 2019 (%)



Source: WTO Tariff Profile 2019.
Note: Libya is not included in this figure because its tariff rate is zero. MFN = most favored nation.

Figure 6.13 shows tariffs faced and imposed by AMU countries. Several characteristics should be noted. First, tariffs imposed on the agriculture sector are generally higher than those imposed on nonagriculture sectors. Second, when comparing AMU countries to the world's large agricultural producers, it is obvious that the tariff faced by Algerian and Libyan exports, especially in the EU and China, is higher than the one they impose on imports from these countries. The United States (US) seems open to imports from AMU countries. By contrast, tariffs imposed by Tunisia, Morocco, and Mauritania are higher than those imposed by the US, EU, and China. Third, despite the fact that AMU was initially conceived as a free trade agreement, Algeria imposes a tariff of 19.5 percent on other AMU members, Mauritania 13.6 percent, Tunisia 0.3 percent, and Morocco 0.2 percent. Libya is the only country whose tariff is zero. Moreover, all agricultural imports within the AMU face a tariff of 1.2% (Algeria), 3.9% (Libya), 10.8% (Morocco), 10.9% (Tunisia), and 16.2% (Mauritania). Lower tariffs are observed for the manufacturing sector. This finding makes it clear that the first step toward trade integration has not been achieved.

Several national differences are worth highlighting. Libya's tariffs are generally either low or zero (Figure 6.13b). Yet, it faces a tariff of 4 percent in AMU members, 6 percent in Africa, 5 percent in the EU, and 4 percent in the US. These figures are higher for Algeria, which faces a tariff of 23 percent in Africa, 41 percent in the EU, and 18 percent in the US (Figure 6.13b). The EU and US seem to be slightly more open to Tunisia, on which the US imposes a tariff of 7 percent and the EU imposes a 2 percent tariff; and to Morocco, on which the US imposes a tariff of 3 percent and the EU imposes no tariff (Figure 6.13d and e).

Clearly, although the AMU was conceived as a free trade area, tariffs still impede its intraregional trade. A closer look at the product level (Table 6.5) shows that the top products enjoying protection within the AMU are tobacco (18 percent); meat and fish (17.5 percent); dairy and other animal products (15.8 percent); meat and edible meat offal (15.7 percent): and cocoa and its preparations (13.8 percent).

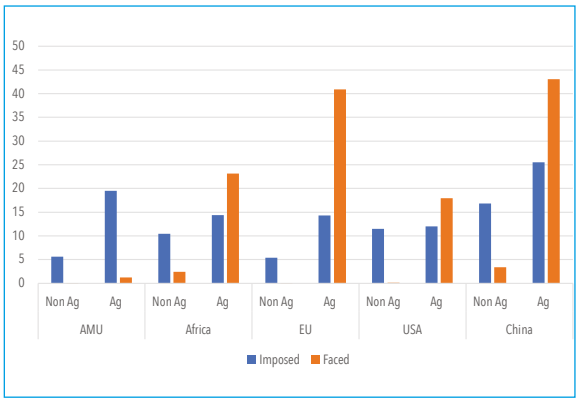
Table 6.5 Top 10 intra–AMU tariffs at HS2 level, 2016 (%)

HS code	Label	Tariff
24	Tobacco and manufactured tobacco substitutes	18.0
16	Meat, fish or crustaceans, mollusks or other aquatic invertebrates; preparations thereof	17.5
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, n.e.s.	15.8
02	Meat and edible meat offal	15.7
22	Beverages, spirits and vinegar	13.8
18	Cocoa and cocoa preparations	13.8
08	Fruit and nuts, edible; peel of citrus fruit or melons	13.2
11	Products of the milling industry; malt, starches, inulin, wheat gluten	12.5
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	12.4
20	Preparations of vegetables, fruit, nuts or other parts of plants	10.7

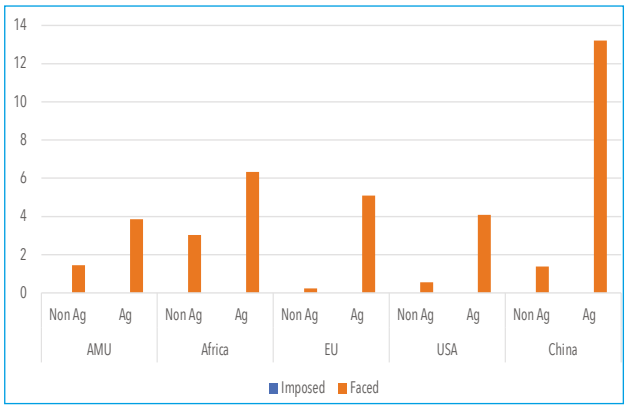
Source: Elaborated using MAcMap-HS6 (2016).

Figure 6.13 Tariffs faced and imposed by AMU countries, 2016 (%)

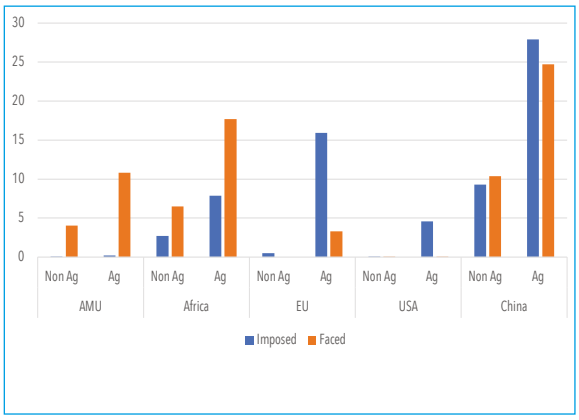
(a) Algeria



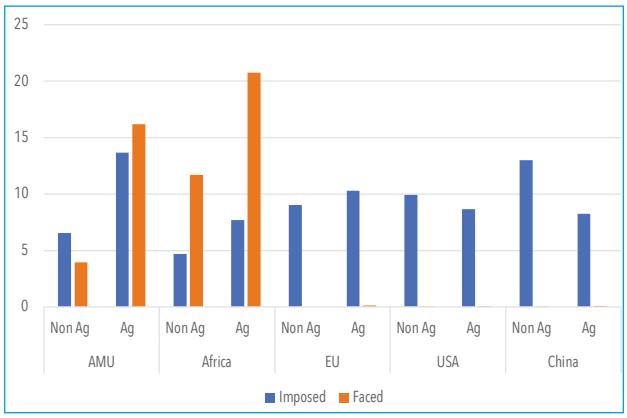
(b) Libya



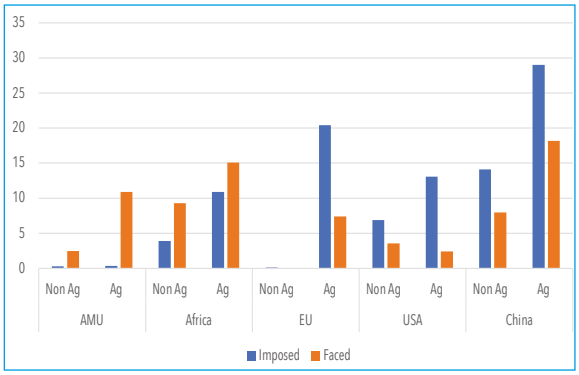
(c) Mauritania



(d) Morocco



(d) Tunisia



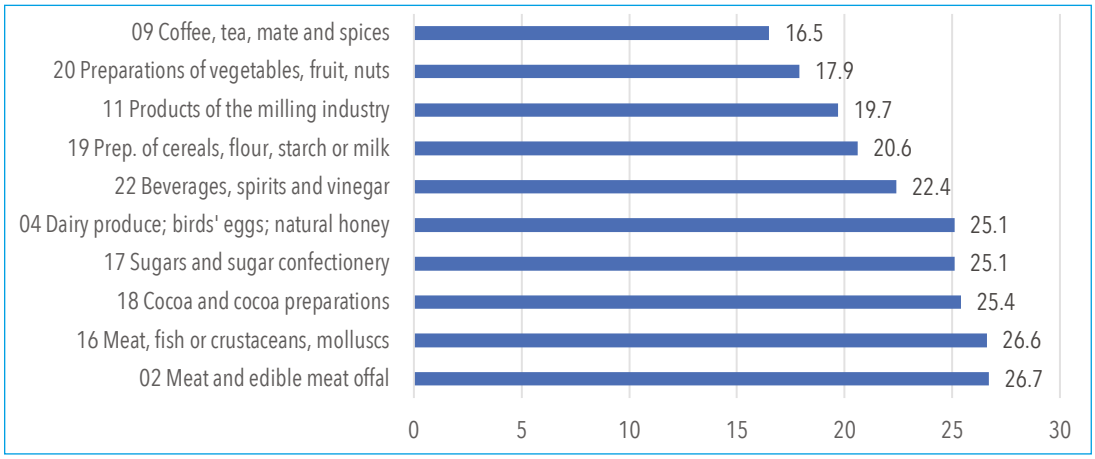
Source: Authors' elaboration using the MAcMap-HS6 dataset.
Note: Ag = Agriculture; Non Ag = Non Agriculture; AMU = Arab Maghreb Union; EU = European Union; CHN = China.

In addition to the intraregional protection, AMU members face varied tariff levels in other destinations. Figure 6.14 shows the 10 highest tariffs imposed by Africa, the EU, and US on AMU countries. Generally, the EU imposes the highest tariffs, followed by Africa and then the US. In Africa, the most protected products are meat (26.7 percent), followed by cocoa, sugar, dairy, beverages, and cereal preparations. In contrast, the EU imposes a significantly higher tariff

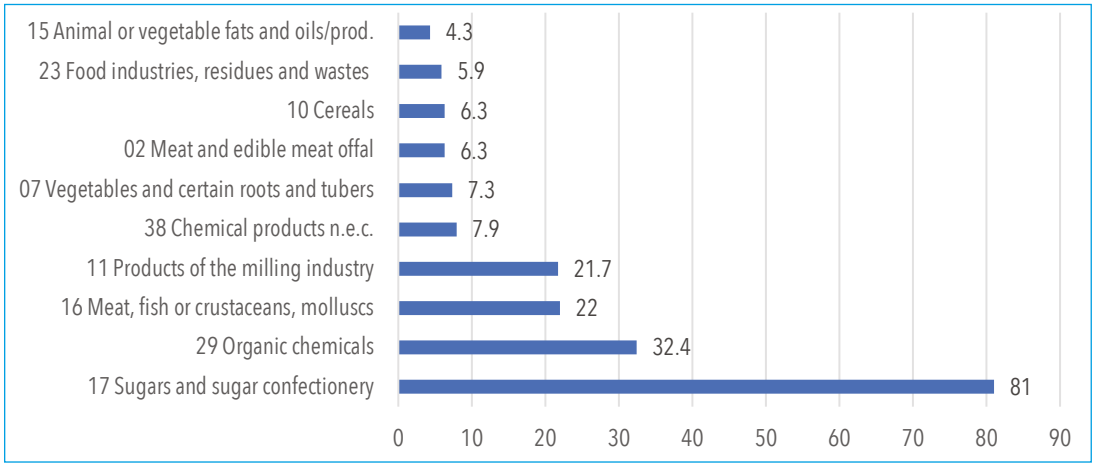
of 81 percent on sugar, followed by organic chemicals, meat, fish and crustaceans, and milling industry products (malt, starches, inulin, wheat gluten). Sugar is also highly protected in the US (29.3 percent), but other products face an average tariff of 2 percent. In a nutshell, tariffs remain an impediment to trade both intra- and extra-regionally, which erodes the competitiveness of AMU countries.

Figure 6.14 Highest tariffs imposed by main trade partners on AMU countries, 2016 (%)

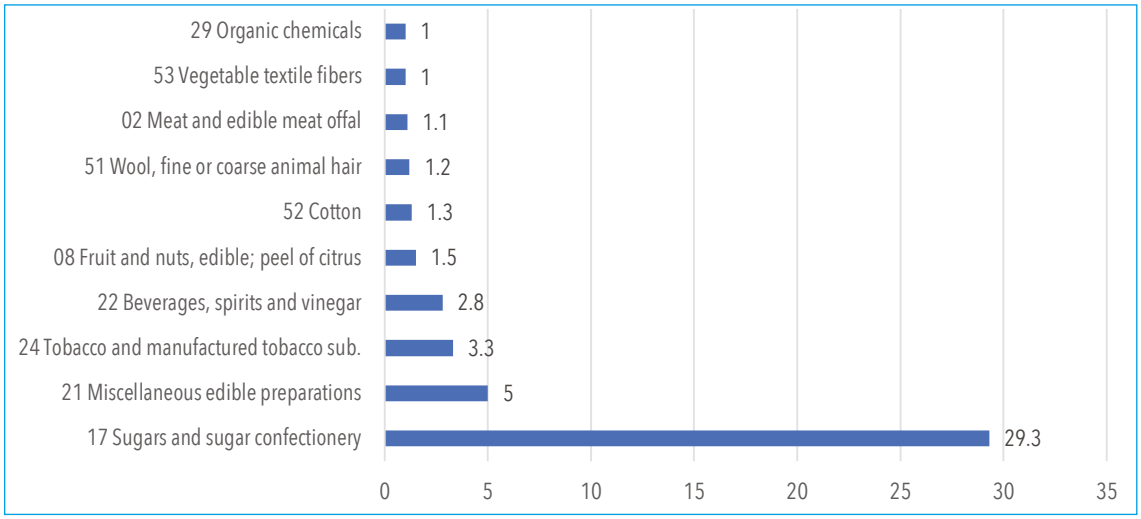
(a) Tariffs imposed by Africa on AMU



(b) Tariffs imposed by EU on AMU



(c) Tariffs imposed by US on AMU

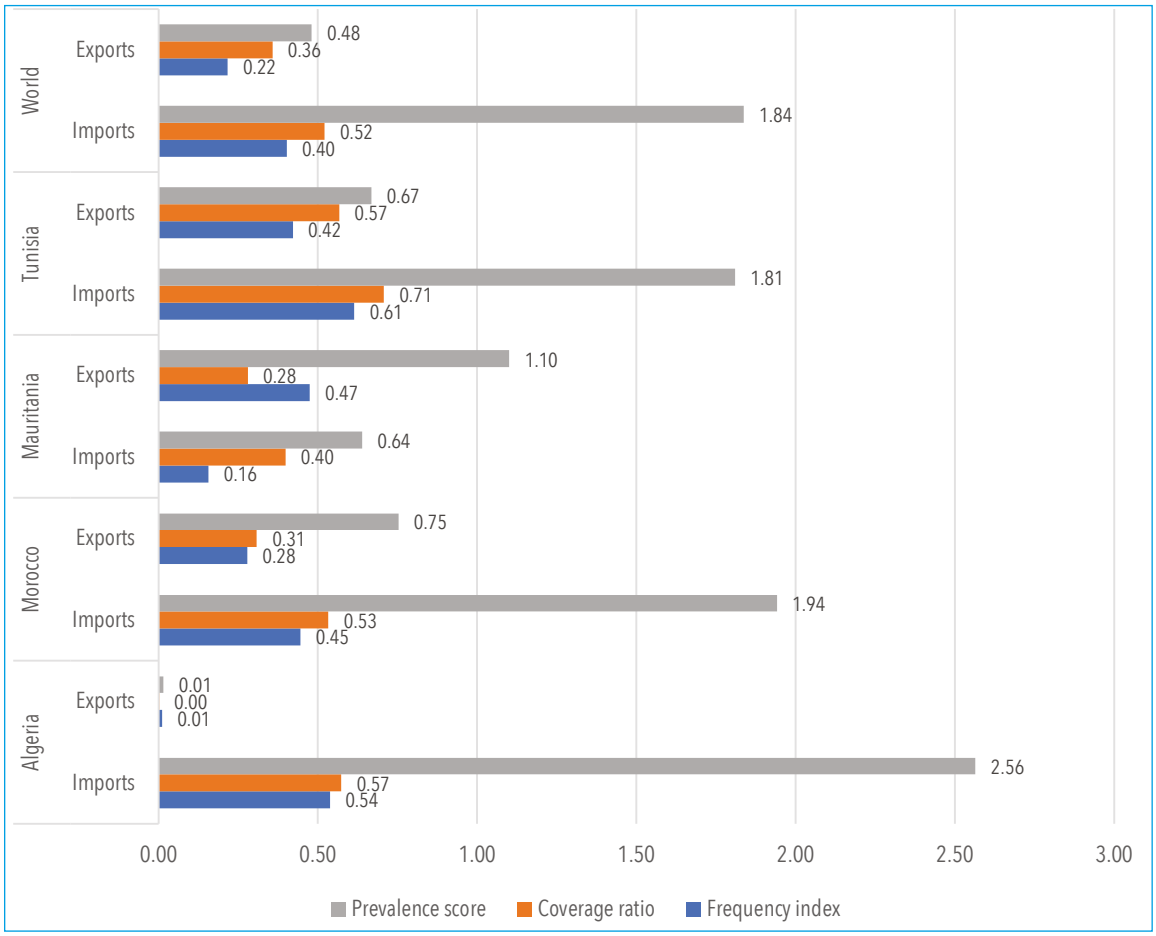


Source: Elaborated using MAcMap-HS6 (2016).
Note: Each label is preceded by the HS2 chapter number.

Nontariff measures

While tariffs have not been fully removed within the AMU, several nontariff measures (NTMs) also hinder the integration of these countries (Augier, Cadot, and Dovis 2013; Walsh and Boustati 2020). Figure 6.15 shows both the *frequency* index, which captures the share of products of a certain country covered by NTMs, and the *coverage* ratio, which is the share of trade subject to NTMs for a certain country. These indexes range between 0 and 1. Generally, the AMU coverage and frequency indicators are higher for imports than for exports; and the coverage ratio is greater than the frequency index, meaning that the share of trade subject to NTMs is greater than the share of products subject to NTMs. Figure 6.15 also shows the *prevalence* score, which counts how many NTMs apply to a given product. The prevalence indicator is high for Algeria, Morocco, and Tunisia.

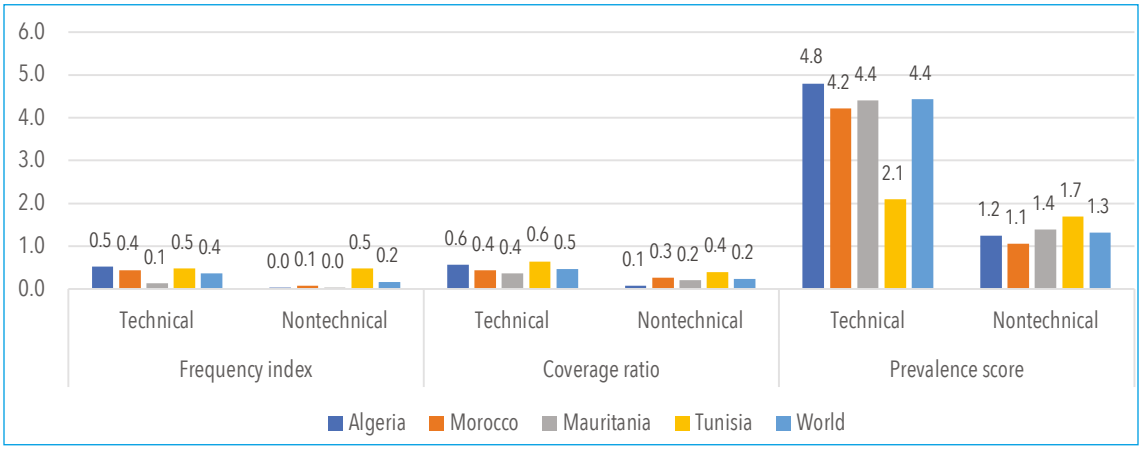
Figure 6.15 Nontariff measures on exports and imports in AMU countries, 2017



Source: UNCTAD 2017.
Note: (i) The frequency index captures the share of products of country i covered by NTMs. (ii) Coverage ratio is the share of trade subject to NTMs for a country i (or for a region), or a group of products. (iii) Prevalence counts how many measures apply to a given product. (iv) Coverage ratios and frequency indexes range between 0 and 1. The higher the indicator, the higher the incidence of a nontariff measures.

Yet, as argued by Maertens and Swinnen (2009) and Odjo and Zaki (2020), there are important distinctions among NTMs. Some NTMs are technical (including sanitary and phytosanitary measures and technical barriers to trade) and others are nontechnical (including contingent trade measures, quantitative restrictions, price controls, and finance measures). For all AMU countries, both the frequency index and the coverage ratio are higher for technical measures than for nontechnical measures, indicating that standards and norms remain an issue for AMU countries. Furthermore, the frequency index for technical measures is lower than the coverage ratio, which confirms this conclusion. Indeed, the share of trade subject to NTMs is higher than the share of products (Figure 6.16). It is important to note also that, for technical measures, Tunisia and Algeria have frequency indexes and coverage ratios above the world average.

Figure 6.16 Technical vs. nontechnical nontariff measures in AMU countries, 2017



Source: UNCTAD 2017.
Note: (i) The frequency index captures the share of products of country i covered by nontariff measures (NTMs). (ii) Coverage ratio is the share of trade subject to NTMs for a country i (or for a region), or a group of products. (iii) Prevalence counts how many NTMs apply to a given product. (iv) Coverage and frequency indexes range between 0 and 1. The higher the index, the higher the incidence of NTMs. (v) The prevalence score does not have a specific range since a specific product can experience more than one NTM.

A more detailed look at the types of NTMs imposed in AMU countries shows that they are chiefly technical barriers to trade, followed by sanitary and phytosanitary measures, pre-shipment inspections, and export-related measures (see Table 6.6). Interestingly, some countries are characterized by nontechnical measures (which is the case of pre-shipment inspection in Algeria and Tunisia, price controls in Morocco, Mauritania, and Tunisia, and quantitative restrictions in Algeria, Mauritania, and Tunisia).

Table 6.6 Types of nontariff measures in AMU countries, 2017

	Algeria		Morocco		Mauritania		Tunisia	
Rank	Coverage	Frequency	Coverage	Frequency	Coverage	Frequency	Coverage	Frequency
1	TBT	TBT	TBT	TBT	Export	Export	TBT	TBT
	0.54	*0.47*	*0.41*	*0.41*	*0.28*	*0.47*	*0.57*	*0.42*
2	SPS	Pre-Ship	Export	Export	TBT	SPS	Export	Export
	0.19	*0.18*	*0.31*	*0.28*	*0.25*	*0.12*	*0.57*	*0.42*
3	Pre-Ship	SPS	Price	SPS	Price	TBT	Pre-Ship	Price
	0.15	*0.07*	*0.26*	*0.10*	*0.17*	*0.02*	*0.26*	*0.38*
4	Quantity	Quantity	SPS	Price	Pre-Ship	Quantity	Quantity	Finance
	0.07	*0.02*	*0.20*	*0.07*	*0.16*	*0.02*	*0.22*	*0.22*
5	Other	Other	Pre-Ship	Pre-Ship	Other	Price	Price	Pre-Ship
	0.04	*0.02*	*0.07*	*0.06*	*0.16*	*0.01*	*0.19*	*0.15*

Source: UNCTAD 2017.
Note: (i) The frequency index captures the share of products of country i covered by NTMs. (ii) Coverage ratio is the share of trade subject to NTMs for a country i (or for a region), or a group of products. (iii) Coverage and frequency indices range between 0 and 1. The higher the index, the higher the incidence of a nontariff measure. (iv) Numbers in italics show the corresponding index value of each measure. (v) TBT stands for technical barriers to trade, SPS for sanitary and phytosanitary measures, Export for export-related measures, Price for price controls, Pre-Ship for pre-shipment inspection, Quantity for quantity restrictions, Finance for finance measures, and Other for other measures.

Table 6.7 shows that, generally, the frequency index is higher than the coverage ratio, indicating that the share of products that is subject to NTMs is higher than the corresponding share of trade subject to NTMs. Second, these indexes are higher for countries' imports than exports, highlighting the protectionist effect of these measures. Yet, there is some heterogeneity at the sectoral and country levels. First, all the indexes are zero for Algeria's exports. In terms of prevalence scores, in Algeria imports of vegetables face the highest number of NTMs; the same is true in Morocco. However, for imports to Mauritania and Tunisia, the highest prevalence score is in the animal sector. For exports, Tunisia has the highest values for both the frequency index and coverage ratio for animal, vegetable, and food sectors, followed by Morocco and Mauritania.

Table 6.7 Nontariff measures in agriculture sectors of AMU countries, 2017

		Imports			Exports		
		Frequency index	**Coverage ratio**	**Prevalence score**	**Frequency index**	**Coverage ratio**	**Prevalence score**
Algeria	Animal	0.92	0.93	10.57	0.00	0.00	0.00
	Vegetable	1.00	1.00	11.12	0.00	0.00	0.00
	Food	0.97	0.81	10.71	0.00	0.00	0.00
Morocco	Animal	0.89	0.67	10.65	0.82	0.67	3.95
	Vegetable	0.93	0.59	11.73	0.94	0.93	2.69
	Food	0.97	0.72	8.33	0.80	0.85	2.19
Mauritania	Animal	0.89	0.93	4.12	0.73	0.72	1.71
	Vegetable	0.90	0.51	3.72	0.00	0.00	0.00
	Food	0.90	0.80	3.99	0.19	0.04	0.46
Tunisia	Animal	1.00	1.00	11.39	1.00	1.00	3.13
	Vegetable	1.00	1.00	6.16	1.00	1.00	2.58
	Food	0.94	0.85	4.46	0.99	0.99	2.81

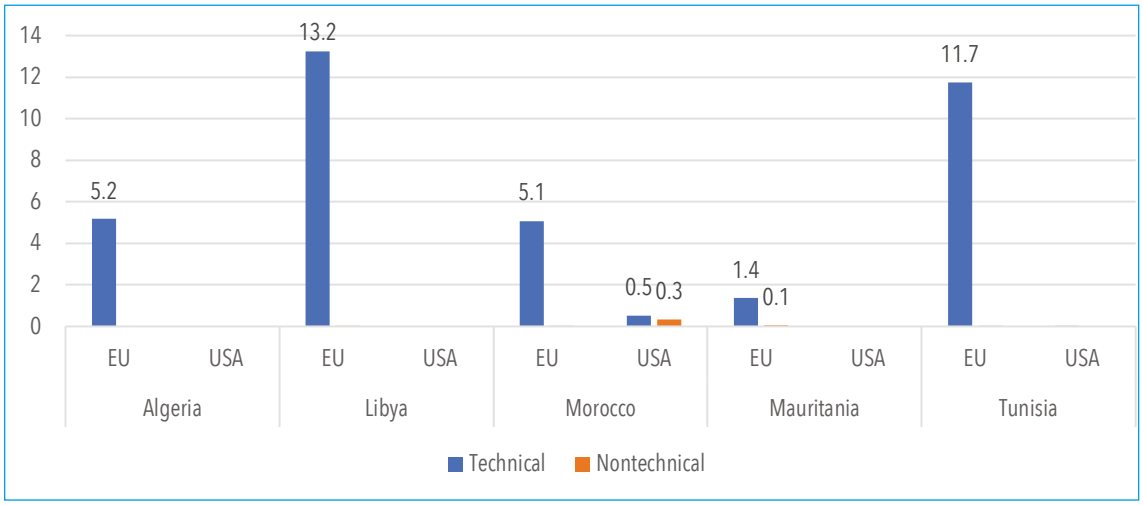
Source: UNCTAD 2017.
Note: (i) The frequency index captures the share of products of country i covered by nontariff measures (NTMs). (ii) Coverage ratio is the share of trade subject to NTMs for a country i (or for a region), or a group of products. (iii) Prevalence counts how many NTMs apply to a given product. (iv) Coverage and frequency indexes range between 0 and 1. The higher the index, the higher the incidence of NTMs. (v) The prevalence index does not have a specific range since a specific product can experience more than one NTM.

It is important also to look at the domestic support provided to the agriculture sector. We focus on Tunisia and Morocco, since Algeria and Mauritania have not notified any domestic support programs at the WTO and Libya is not a WTO member. According to the *Trade Policy Review of Morocco* (2015), the Moroccan government provides some subsidies and long-, medium-, and short-term concessional loans, as well as technical and material assistance, to help agriculture-sector workers improve their competitiveness. Several activities are eligible, such as providing farms with new tractors and agricultural equipment; hydro-agricultural development and land improvements for farms (well-digging, irrigation equipment); increasing livestock production; genetic improvement of cattle, sheep, and goats; and building and equipping cooperative milk collection operations. In Tunisia, most support is through either the WTO Green Box (research, pest and disease control, and infrastructural services) or development programs (investment subsidies granted under the country's investment code and intended for integrated projects).

Ad valorem equivalents of NTMs, calculated by the World Bank, that are imposed by the AMU's main trade partners are shown in Figure 6.17. Technical measures imposed by the EU

are particularly impeding for AMU countries, reaching 13.2 percent for Algeria, 11.7 percent for Tunisia, 5.2 percent for Algeria, 5.1 percent for Morocco, and 3.2 percent for Mauritania. In contrast, the technical measures applied by the US do not have a significant impact on AMU exports, except a small impact on Morocco's exports. Nontechnical measures applied by both the EU and the US on AMU exports likewise do not have a significant impact, except in the case of Morocco's exports to the US.

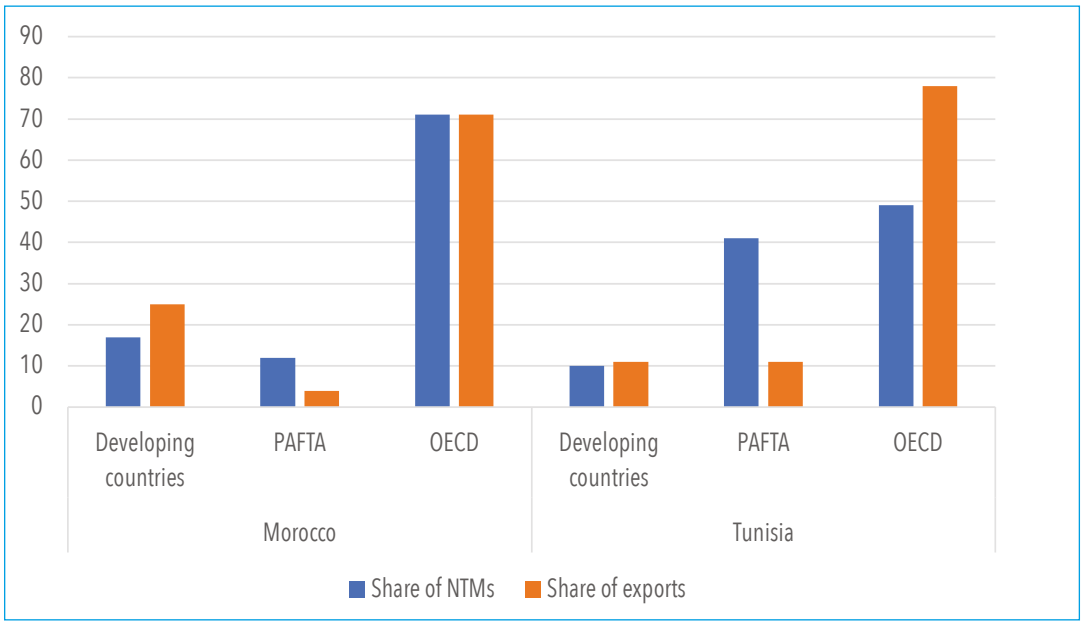
Figure 6.17 Ad valorem equivalents of technical and nontechnical measures faced by AMU exports to the EU and US, 2016 (%)



Source: World Bank 2019.

Clearly, the OECD countries impose the lion's share of NTMs (in terms of number of measures) on the AMU (71 percent for Morocco and 49 percent for Tunisia) (Figure 6.18). Yet, 12 percent and 41 percent of NTMs are faced by Morocco and Tunisia, respectively, in other Arab countries, while their exports to these countries are 4 percent and 11 percent respectively. These costly measures thus continue to impede intra–Arab (including AMU) exports.

Figure 6.18 Number of nontariff measures faced by AMU countries in different destinations (%)



Source: International Trade Centre 2013.
Note: Data for Libya, Mauritania, and Algeria are not available. PAFTA = Pan-Arab Free Trade Area. Data for Tunisia are for 2012; data for Morocco are for 2011.

Trade logistics

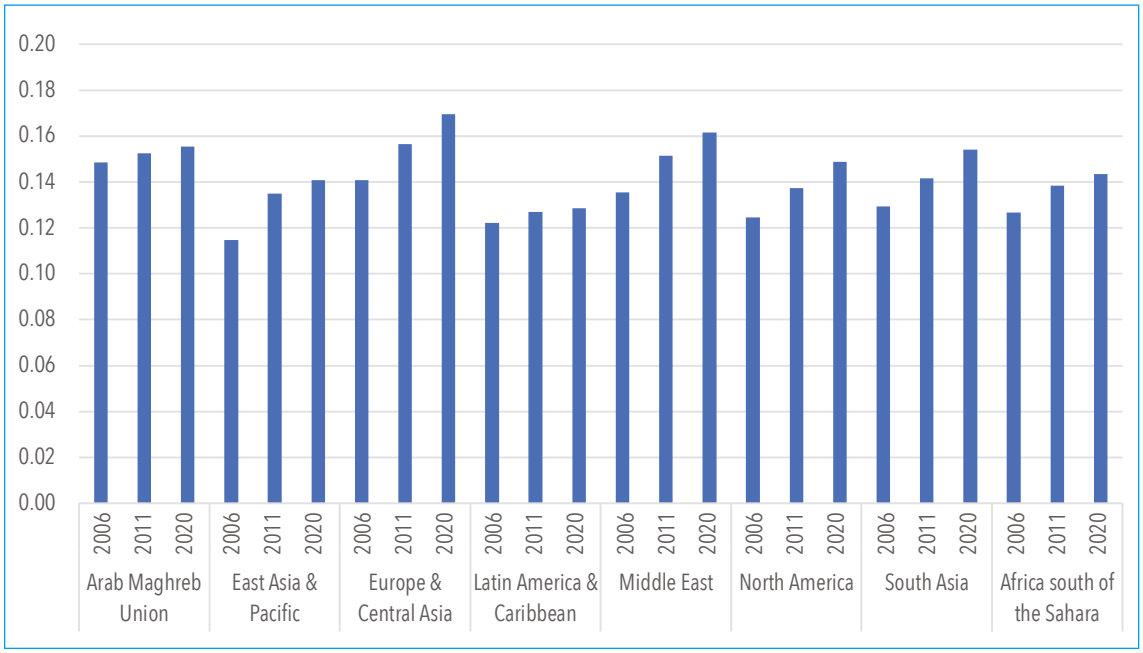
To assess trade barriers beyond tariffs and nontariff barriers, this section looks at trade facilitation measures. Poor transport connectivity continues to be a major barrier constraining developing country connections to global markets. Maritime transport accounts for 80 percent of global trade by volume and more than 70 percent by value, and is one of the main transport modes used by developing countries (UNCTAD 2017). For this reason, we focus on maritime transport here. However, since transport by ship is not preferred for highly perishable agricultural products, we also consider time to export, time to import, and cost to export and cost to import. We also take into consideration quality of infrastructure, including air transport, roads, ports, electricity, and telephone systems, to approximate costs for other modes of trade transport.

To compare AMU countries to other regions of the world in terms of trade facilitation measures, we use the Liner Shipping Bilateral Connectivity Index (LSBCI) as an indicator of maritime connectivity. This index captures the overall quality of a shipping connection between a pair of countries using data from UNCTAD on the number of transshipments, competition level among shipping services, direct connections between country pairs, and ship sizes.

The LSBCI indicates that AMU connectivity to Europe and the Middle East is greater than its own intraregional connectivity. Intra–AMU connectivity is comparable to AMU connectivity to Africa south of the Sahara, the Middle East, and distant regional blocs such as South Asia and North America (Figure 6.19a). The connectivity of AMU countries, along with Africa south of the Sahara, is the lowest in the world (Figure 6.19b). Notably, Morocco now has exceptional maritime connectivity compared with other AMU countries, having improved its connectivity substantially since 2006 (Figure 6.19c). Furthermore, the region displays the highest cost to trade of the world followed by Africa south of the Sahara (see Figure 6.21a). Morocco has also performed exceptionally in cutting its costs and time to import and to export since 2015 (Figure 6.20a and Figure 6.20b). Morocco's infrastructure, and ports in particular, are on a par with European and North American quality levels, highlighting the country's significant progress. However, apart from Morocco, the quality of ports and railroads is generally poor in the AMU region, which increases their trading costs (Figure 6.21c). These results make it clear that trade logistics are one of the biggest obstacles to intraregional trade.

Maritime connectivity between AMU countries and other regions increased from 2006 to 2020, as measured by the LSBCI (Figure 6.19a). AMU–Europe is now the best-connected regional pair. After Europe, AMU is best connected to Central Asia and then to the Middle East. Moreover, AMU connectivity to these regions is higher than maritime connectivity within AMU countries. While intra–AMU maritime connections are important, connectivity did not improve much from 2006 to 2020.

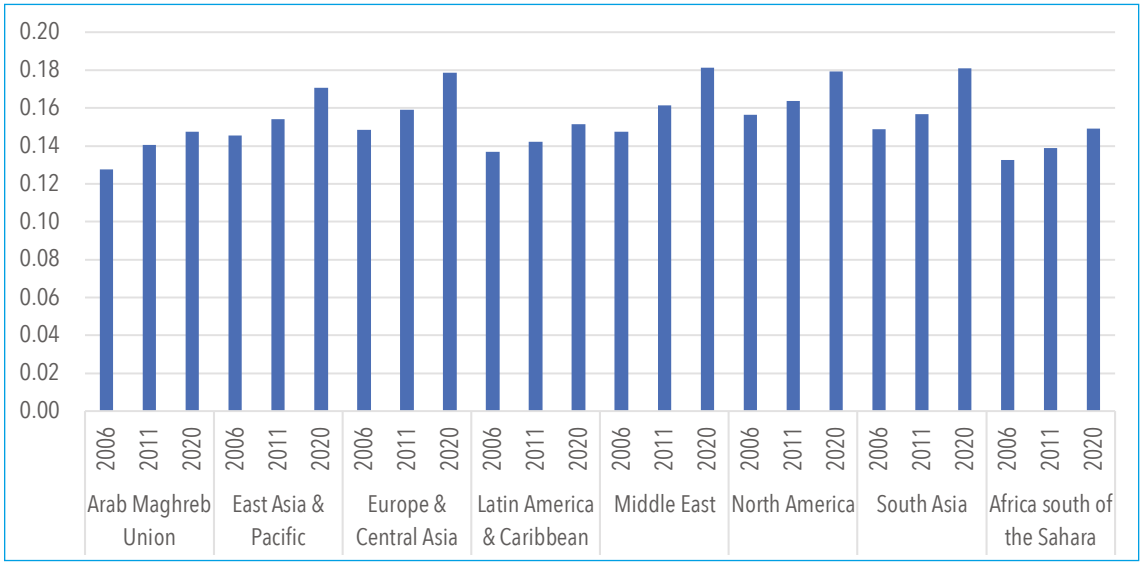
Figure 6.19a Maritime connectivity between the AMU and other regions



Source: Constructed from UNCTAD data (2017).

For all regions, measures of maritime connectivity to the rest of the world have improved substantially since 2006 (Figure 6.19b). As of 2020, the Liner Shipping Connectivity Index (LSCI) is approximately equal for Europe, Central Asia, the Middle East, North America, and South Asia. Maritime connectivity levels for the AMU region are lower, and close to the level of Africa south of the Sahara.

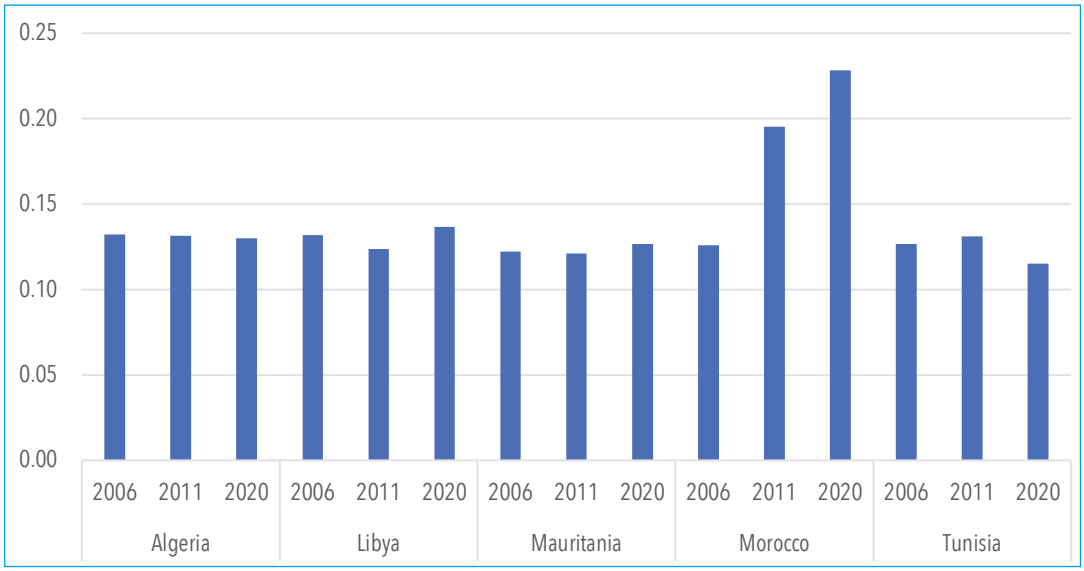
Figure 6.19b Maritime connectivity to the world by region



Source: Constructed from UNCTAD data.

Maritime connectivity by AMU country to all other countries in the world, including other AMU countries, is shown in Figure 6.19c. Compared with the other AMU countries, Morocco has the strongest liner shipping connections. In 2020, the LSCI for Morocco reached 0.23. However, the LSCI for Algeria and Tunisia decreased between 2006 and 2020.

Figure 6.19c Maritime connectivity to the world, by AMU country



Source: Constructed from UNCTAD data.

The World Bank's Doing Business database provides indicators related to cross-border trading, including time and cost measures of exporting and importing goods from a logistical perspective. Time is measured in hours and costs are reported in US dollars. Those measures consider documentary compliance (meeting documentary requirements of government agencies) and border compliance (customs regulations, mandatory inspections for clearance) in the process of exporting or importing a shipment. In the following analysis, we use four indicators:

2) Time to export/import associated with documentary compliance.

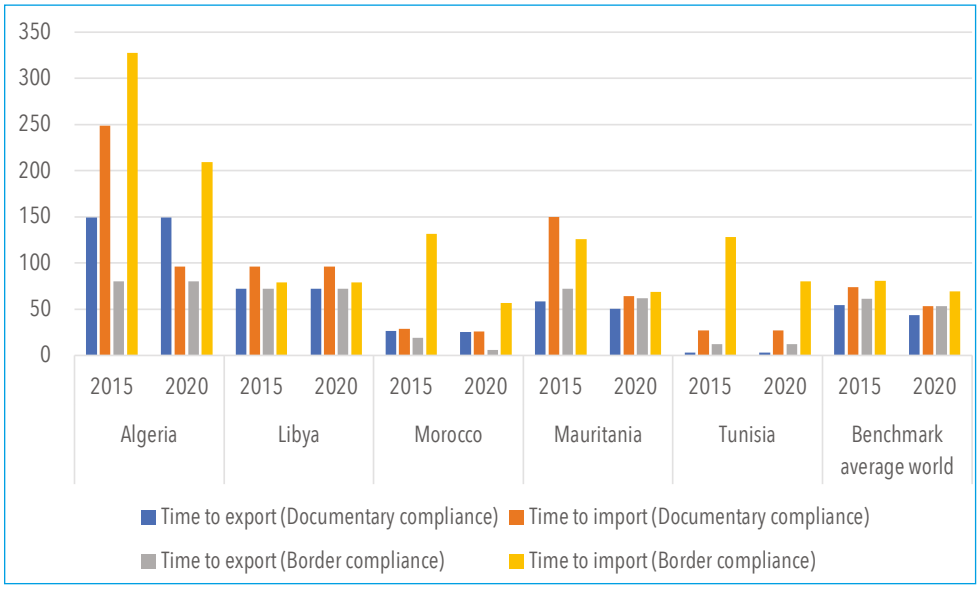
3) Time to export/import associated with border compliance.

4) Cost to export/import associated with documentary compliance.

5) Cost to export/import associated with border compliance.

Figure 6.20a shows that time to import is higher than time to export for AMU countries. Additionally, the time needed for documentary compliance when importing is generally less than the time needed for border compliance, with the exception of Libya. Morocco shows the best performance compared to both other AMU countries and the world average. Morocco has decreased both the time to export and, more dramatically, the time to import since 2015. Algeria has the highest time to export and to import compared to other AMU countries and to the world average.

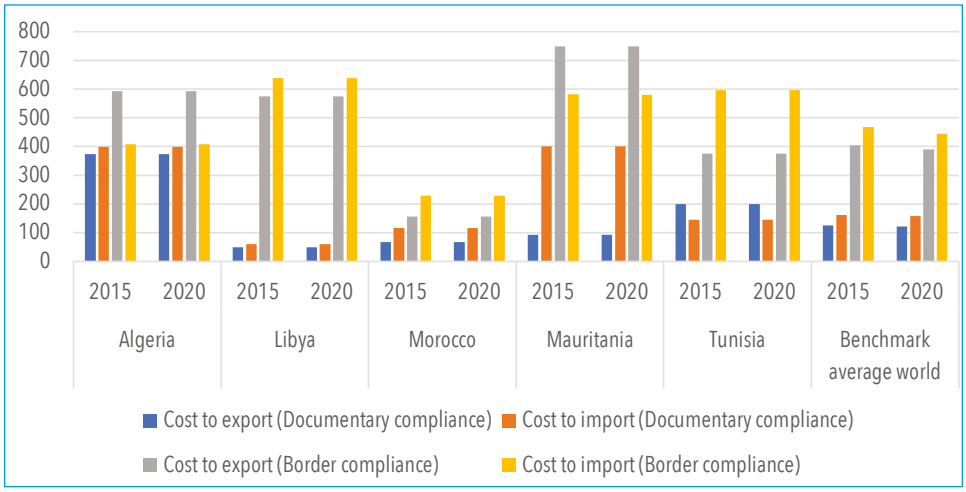
Figure 6.20a Time to export/import by AMU country (hours)



Source: Constructed from data from the World Bank Doing Business Project.

Figure 6.20b illustrates cost to export/import by AMU country. Interestingly, costs to export and to import were stable between the years 2015 and 2020 for all AMU countries. Furthermore, border compliance costs have been higher than documentary compliance costs. Cost of border compliance for imports are among the highest costs reported, particularly for Libya and Tunisia, where they are above the average world cost. In 2020, border compliance costs are high for Mauritania and low for Morocco, while documentary compliance costs for exports are highest for Algeria and lowest for Libya. Notably, all of Morocco's costs are below average world costs.

Figure 6.20b Cost to export/import by AMU country (US$)

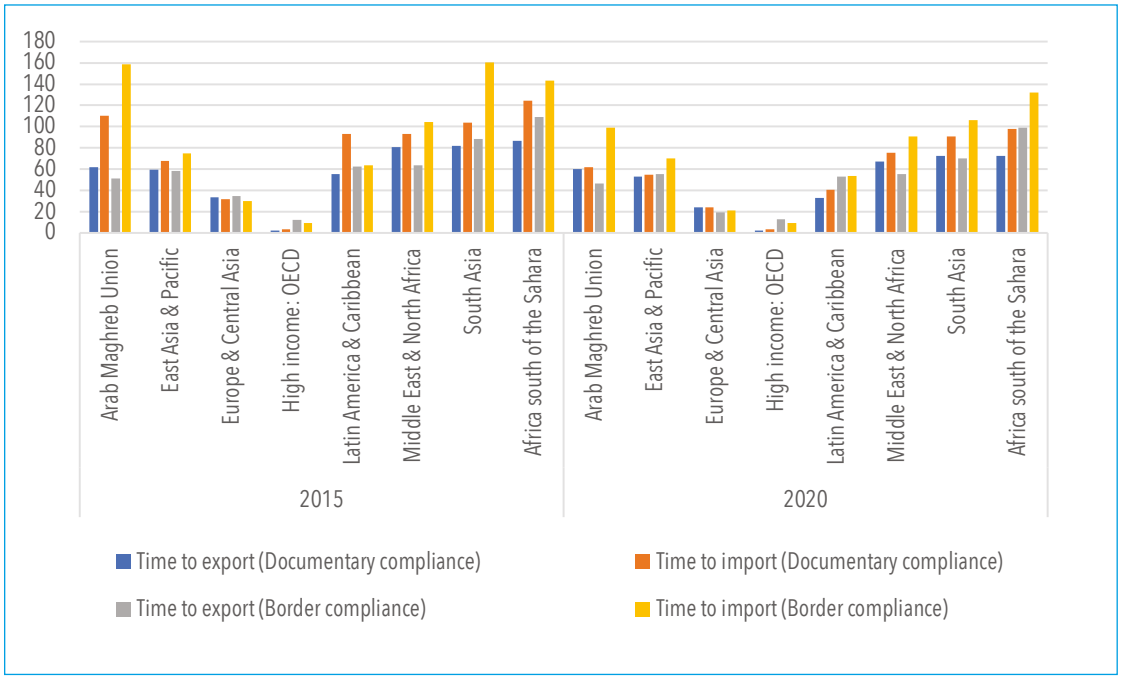


Source: Constructed using data from the World Bank Doing Business Project.

At the regional level, the time required for border compliance to import is among the highest for AMU countries in 2020, behind sub-Saharan African countries and South Asian countries (Figure 6.21a). Time related to documentary compliance for exports is also relatively high for AMU, though less than sub-Saharan African countries, South Asian countries, and the Middle East and North African (MENA) countries. However, AMU border compliance for imports takes more time than both documentary compliance and time to export in all regions. Overall, time to import and

time to export decreased slightly for all regions between 2015 and 2020, most notably for AMU, Europe and Central Asia, and Latin America.

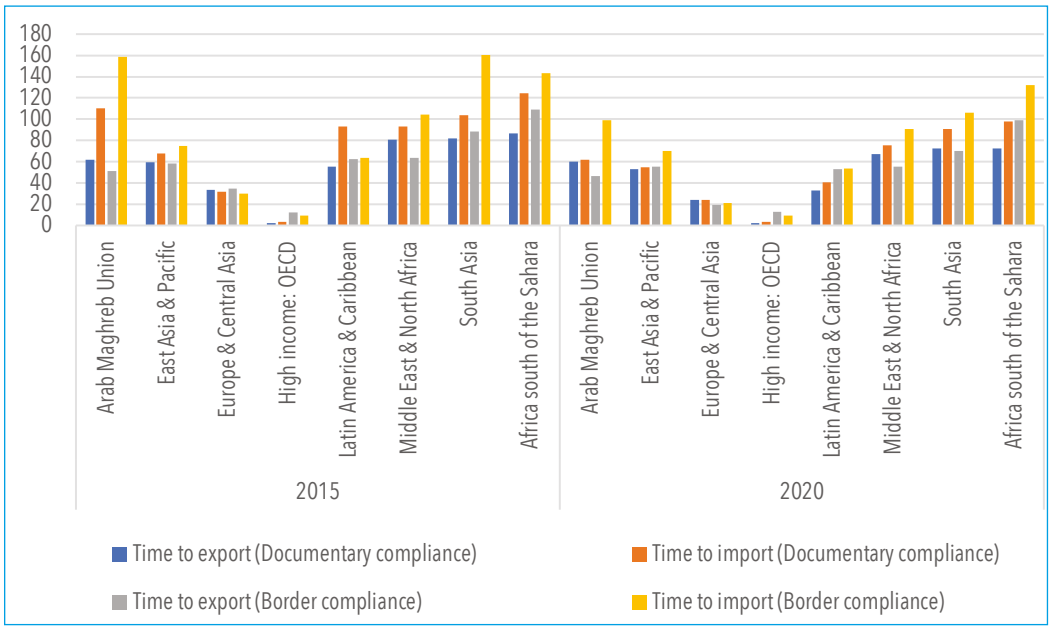
Figure 6.21a Time to export/import by region in 2020 (hours)



Source: Constructed from data from the World Bank Doing Business Project.

In terms of regional trade, the costs related to border compliance for AMU imports and exports are lower than those of Africa south of the Sahara, Latin America, South Asia, and MENA (Figure 6.21b).

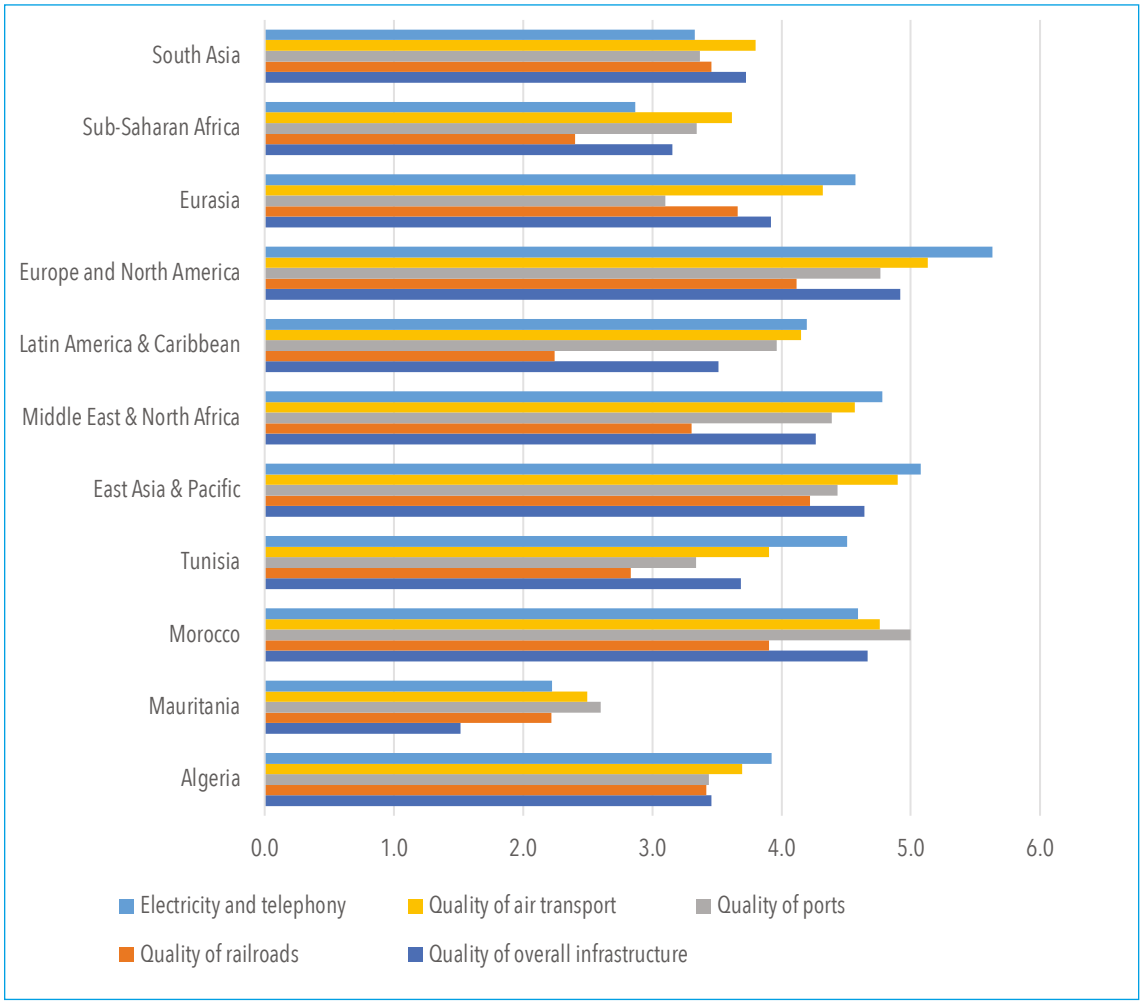
Figure 6.21b Cost to export/import by region in 2020 (US$)



Source: Constructed from data from the World Bank Doing Business Project.

Trade is also affected by the quality of infrastructure, including electricity, telephone connections, railroads, ports, and air transport (Figure 6.22). The Global Competitiveness dataset[5] provides a "quality of infrastructure" index, which shows that, generally, conditions are worse in Mauritania than in Algeria, Tunisia, and Morocco. While electricity and telephone connections are of good quality in Tunisia and Morocco compared to other regions, in Tunisia the quality of ports and railroads is relatively low. However, in Morocco, the quality of infrastructure, and in particular the quality of ports, is about equal to Europe and North America, highlighting the country's significant progress. Obviously, the poor quality of ports and railroads in AMU countries affects their cross-border trade. Improving the region's infrastructure is thus a priority for boosting trade in general and particularly trade in perishable (time-sensitive) agricultural products.

Figure 6.22 Quality of infrastructure in AMU countries, 2018



Source: Constructed using data from the Global Competitiveness dataset.
Note: The index range is from 1 (worst) to 7 (best).

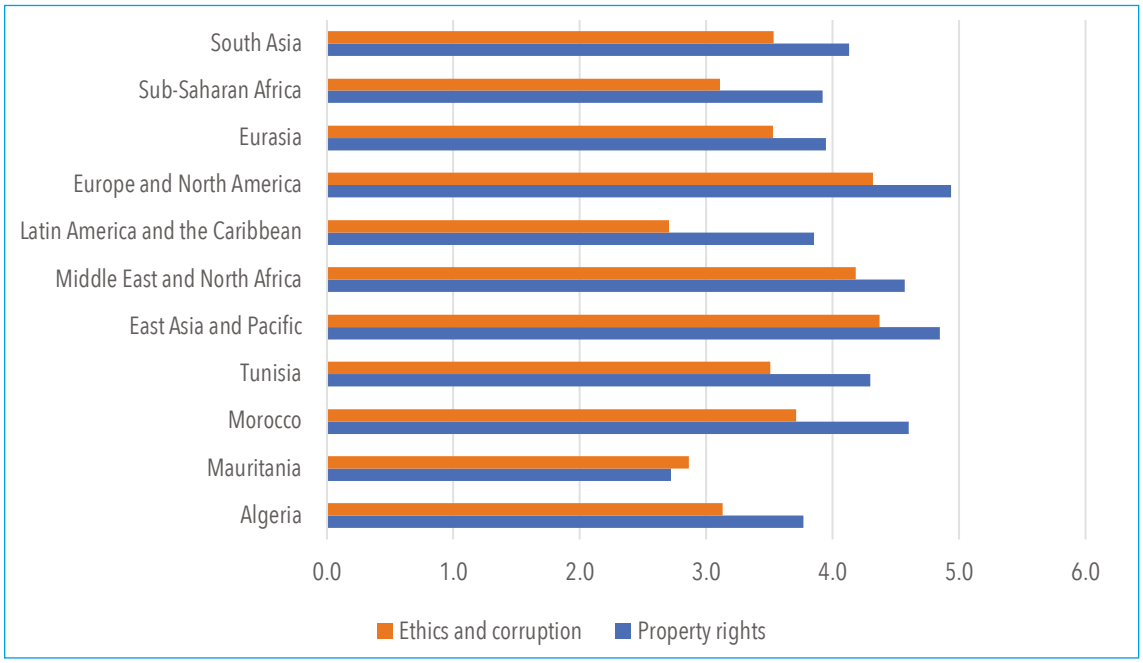
5 This indicator includes the following dimensions: (a) quality of overall infrastructure, (b) quality of roads, (c) quality of railroad infrastructure, (d) quality of port infrastructure, (e) quality of air transport infrastructure, (f) available airline seat kilometers, (g) quality of electricity supply, (h) fixed telephone lines, and (i) mobile telephone subscriptions.

Domestic institutions

The low level of integration among the AMU countries is not entirely explained by trade policy factors. Several domestic characteristics related to the quality of institutions shape their economies in a broad way, and thus affect trade in agricultural and nonagricultural goods. The literature shows that institutions matter for trade: Nunn and Trefler (2014) provide a comprehensive theoretical and empirical literature review on the effect of institutions on international trade through three main channels — labor market institutions (that affect labor market flexibility); financial institutions (that control access to external finance for firms with large fixed costs); and property rights (that can encourage or discourage investment). Costinot (2005) and Acemoglu, Antràs, and Helpman (2007) have developed theoretical frameworks to show how institutional differences can generate comparative advantages when contracts are imperfect.

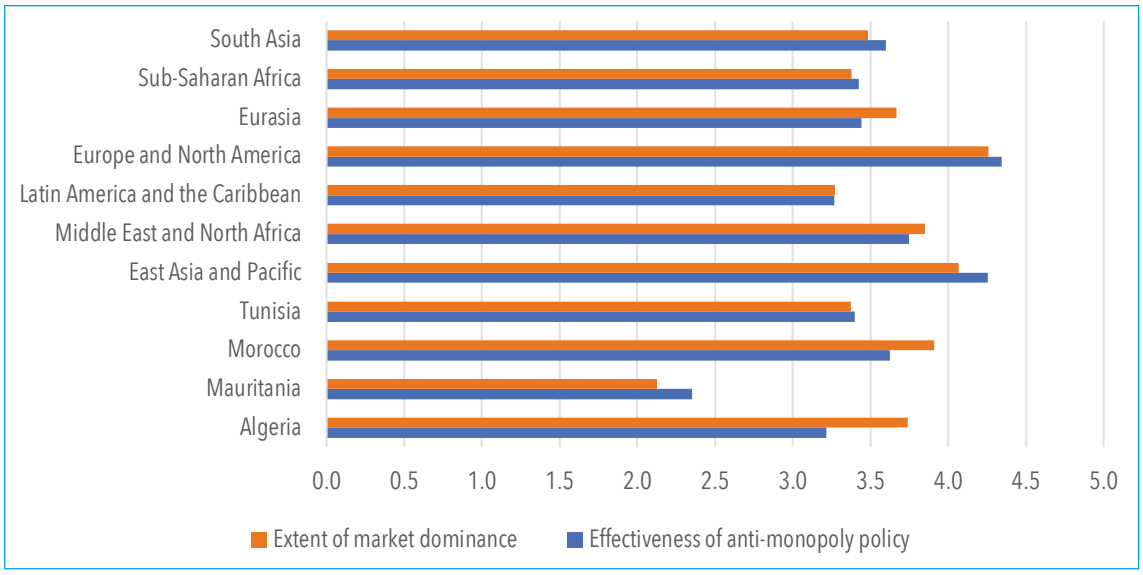
Two critical components of institutional quality — corruption and property rights (Figure 6.23a) and competition (Figure 6.23b) — are measured as part of the Global Competitiveness Index. For these indicators, higher values indicate greater quality. Considering corruption, all AMU countries not only have a lower index than developed regions, such as North America and Europe, but also than the average for some emerging regions, including MENA and East Asia and the Pacific. Among AMU countries, Mauritania and Algeria are performing more poorly than Tunisia and Morocco. For property rights, similar patterns are observed. When competition is taken into consideration (Figure 6.23b), AMU countries (except Morocco) have a lower index (meaning a higher level of market dominance) than the MENA region. Yet, in terms of the effectiveness of anti-monopoly practices, AMU countries are better positioned than Africa south of the Sahara but worse than MENA, Europe, and the US.

Figure 6.23a Corruption and property rights in AMU countries, 2018



Source: Constructed using the Global Competitiveness dataset.
Note: The index range is from 1 (worst) to 7 (best).

Figure 6.23b Competition in AMU countries, 2018



Source: Constructed using the Global Competitiveness dataset.
Note: The index range is from 1 (worst) to 7 (best).

CONCLUSION

This chapter has analyzed the composition and structure of agricultural trade flows of the AMU countries and estimated the untapped export potential, by both product and destination. It has also considered why the AMU has failed to achieve deep integration of the five countries. Our main findings show that, although agriculture is an important sector for the AMU countries, the industrial and service sectors play a larger economic role. Despite the multilateral and bilateral AMU free trade agreements, intra–AMU trade remains low compared to the region's trade with the EU. Within AMU, agriculture and agrifood sector exports and imports are limited for several reasons. These include trade-policy factors (spaghetti bowl agreements, tariffs, NTMs, administrative barriers to trade, and poor connectivity for logistics) and the domestic business environment (infrastructure, institutions, and competition). However, for agricultural products, the untapped potential for intra–AMU trade is relatively limited and will be highly dependent on water availability across the region, given the water stress that these countries are facing.

From a policy standpoint, several recommendations merit discussion. First, in terms of trade structure and untapped potential, a common vision for the agrifood sector could help to drive integration of the AMU countries. On the one hand, AMU countries face common risks of water scarcity and climate change. On the other, they have the means to sustain their food security by implementing a common agricultural policy. To do that, they will need to develop a joint vision and strategy. An approach involving several players and including both private and public stakeholders could be more sustainable than the current top-down decision-making (Aloui 2008). Furthermore, this new kind of cooperation could effectively address harmonization of standards, tariffs, and other market distortions. Thus, this platform could trigger a variety of investments, including for (i) *horizontal integration* in the food industry through multinational firms operating in the region and based on economies of scale, similar consumer preferences, and proximity; and (ii) *vertical integration* through local firms, based on complementarities in resources (Aloui 2018). A common agricultural policy mobilizing public–private partnerships that focus on building regional agricultural value chains also requires considerable mobilization of private investment. This could offer interesting opportunities for traditional partners such as European countries to invest in local firms or to adopt co-production schemes.

Second, in order to make the AMU more effective and better interconnected, regional integration of AMU countries should be viewed through a more comprehensive lens, linking trade policy with other policies, such as agricultural, industrial and competition policies. This could improve the trade performance of these countries. Tariffs are also an issue for AMU countries, as was demonstrated. Removing these tariffs entirely will help them increase their intraregional trade flows.

Third, improving infrastructure and working on common projects that connect AMU countries could boost their intraregional trade flows. Finally, one of the main challenges hampering AMU integration is the lack of political will (AfDB 2019). Country-level priorities have frequently undermined the regional integration process; few decisions taken at regional level are implemented at the national level (AfDB 2020). For example, as stated earlier, although the five countries signed more than 30 multilateral agreement protocols, only 5 of these include all Union members. Likewise, the fact that the AMU heads of state have not met since April 1994 points to the lack of political will that is essential to deep integration. Yet it is important to note that, although the AMU is moderately integrated, it has a regional integration index slightly higher than that of other regional blocs, including ECOWAS,[6] COMESA, SADC, ECCAS,[7] and others.

The region's prospects may be buoyed by membership of AMU countries in the AfCFTA, which brings together all African countries and may offer new opportunities for regional integration and trade development. The AMU, along with other regional blocs, should play a supporting role in the development of regional value chains in each subregion of the continent. However, the current COVID-19 crisis has slowed implementation of the AfCFTA and with it, regional integration.

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6 ECOWAS: Economic Community of West African States.

7 ECCAS: Economic Community of Central African States.

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SUMMARY AND CONCLUSION

The *2021 Africa Agriculture Trade Monitor* (AATM) has presented an overview of trade in agricultural products in Africa and highlighted the main impediments affecting intra- and extra-African trade. It also focused on the consequences, for Africa and its agricultural trade, of the global health and economic crisis caused by the COVID-19 pandemic. This conclusion summarizes the report's major findings and offers policy recommendations for improving agricultural export performance, especially in the context of the unprecedented global uncertainty created by the pandemic.

The **first chapter** provided a general overview of the report and highlighted several important ways the pandemic has affected Africa, in terms of health and the economy. It also reviewed the implementation of the African Continental Free Trade Area (AfCFTA) since its inauguration on January 1, 2021. The chapter concluded with a discussion of the data used in this report, including an explanation of the methodology adopted and some general recommendations for improving trade data in Africa.

The **second chapter** of the AATM usually presents recent general trends in African agricultural trade. This was done again this year, with an examination of Africa's comparative advantages in agriculture. The chapter showed that, in addition to its advantage in what are commonly called cash crops (coffee, cocoa, tea, cotton), Africa is also very successful in exporting niche products (cashew nuts, kola nuts, vanilla, sesamum seeds, locust beans, and others), that is, products for which world exports are generally less than US$1 billion. In this year's report, Chapter 2 also offered a new analysis. First, it provided a typology of African and non-African economies that categorizes them as diversified or non-diversified and as exporters of either standard or exclusive products. South Africa (in 2003–2005) and Egypt (in 2017–2019) are the two countries that have come closest to countries with a high diversification index, while all other African economies are classified as nondiversified. Second, this chapter gave an overview of Africa's trade in calories and in resources that are embodied in traded products. Out of 52 African countries, 47 are net importers of calories and only 5 are net exporters. For example, Djibouti is a net importer of 76 percent of the World Health Organization's recommended daily calorie consumption per person (1,593 kcal of 2,100 kcal), and Mauritius is a net exporter of 163 kcal per person per day. In terms of water content (virtual water) of traded products, many African countries that were predominantly net exporters in 1986 became net importers by 2010. Third, this chapter showed that in addition to at-the-border policies that impede African agricultural exports, such as inefficient customs procedures and nontariff measures (NTMs), domestic factors also contribute to poor African performance: low levels of land use, of land equipped for irrigation, of yield and productivity, of fertilizer consumption, and of agricultural research and development (R&D) expenditures.

As in previous years, the **third chapter** focused on intra-African trade in agricultural products, with an emphasis on 10 products of importance to the continent's food system: cereals and pulses (rice, maize, wheat, beans), vegetables (potatoes, onions, tomatoes), and fruit (bananas and plantains, citrus fruit, and apples). The structure of African trade varies greatly across products. For example, the share of intra-African trade in total African imports is low for cereals, but high for tomatoes and citrus fruit. An interesting new approach included in Chapter 3 this year was the use of network analysis. This allowed for depictions of intra-African networks and pointed to some interesting conclusions for each product. It showed, for example, that intra-African trade in rice is organized in regional clusters, and links to countries outside each cluster are limited; the same is true of the intra-African trade in beans. The network analysis also illustrated the concentration of the intra-African maize trade network, in which just 10 trade links constitute 62.7 percent of total trade.

The **fourth chapter** examined the defensive interest of Africa in three value chains that are important for food security and nutrition: meat, dairy, and poultry. From what can be concluded from chaotic trade data (various sources with different nomenclatures, different methodologies, and volatile funding), the trade performance of these three value chains differs greatly among African countries. Moreover, a significant share of trade in livestock occurs informally. Although a few initiatives are beginning to collect consistent data on informal trade, the overall quality of African trade statistics remains low, and the evidence gap on informal trade in official statistics remains large. At the intra-African level, livestock trade primarily occurs between Southern African countries, plus Libya, Egypt, and Kenya. Trade in live animals represents an important share of traded agrifood products. Moreover, tariffs imposed by African countries on products originating from other African partners remain high. In terms of trade policies beyond the continent, African countries benefit from preferential access in the United States and the European Union; but NTMs are cumbersome and sometimes even prohibitory for African producers, especially sanitary and phytosanitary measures and technical barriers to trade. When domestic support provided by the OECD countries to their farmers is added to these trade impediments, achieving competitiveness on world markets seems out of reach for African farmers in these sectors. Intra-African exports offer the most promising opportunities.

The impact of COVID-19 on agricultural trade, economic activity, and poverty in Africa was examined in the **fifth chapter**. From a health perspective, Africa has been less affected by the pandemic than other regions, at least until now. In the long term, it will likely be difficult for the continent to achieve mass immunization. The chapter explained the main mechanisms that spread the pandemic-related economic crisis from the rest of the world to the African continent, based on Africa's balance of payments. The crisis was amplified by the adoption of health and sanitary measures that affected not only domestic economic activity but also cross-border trade. A review of available trade statistics showed a decline in formal trade and a collapse in informal trade in 2020. Using a computable general equilibrium (CGE) model linked to household surveys, the authors estimated the impact of the shock on economic activity and poverty in Africa: 50.5 million more people are expected to be living in poverty in 2020. Finally, using recent household surveys, the socioeconomic impact of the pandemic was assessed for three countries (Ghana, Uganda, and Senegal). The amount of public transfers needed to fully compensate for the shock at the individual level was estimated — in Uganda the shock could have been easily managed at a relatively low cost, but the costs would have been higher in Ghana and Senegal.

The **sixth chapter** focused on agricultural trade in the Arab Maghreb Union (AMU), a regional economic community (REC) that includes five countries: Algeria, Libya, Mauritania, Morocco, and Tunisia. After a historical review of the formation of this REC, the composition and structure of the AMU countries' agricultural trade were examined: the agricultural exports and imports of these five countries are mainly with the European Union; and within the region, only Morocco and Tunisia are net exporters of agricultural products, while Libya and Mauritania are significant net importers from AMU countries. The potential for expanding trade among these five countries was then assessed, showing that the opportunity for expanding AMU's agricultural exports is mainly to European countries and the United States. Finally, the main barriers to regional trade were identified: tariffs, NTMs, and poor transport infrastructure and customs procedures, except in the case of Morocco. The chapter concludes that while there has been regionalization of trade in this part of Africa, there has been no real trade integration.

One year ago, in the conclusion of the AATM 2020 report, we wrote "At the beginning of July 2020, the main concern of Africans is the COVID-19 crisis and its potential impact on food security on the continent" (Bouët, Odjo, and Zaki 2020, 174). With the slow progress of the vaccination campaign, the pandemic remains a concern for African governments. However, there are some fundamental lessons to be learned from the crisis.

- Global trade policies have been relatively cooperative in response to this crisis. In the food-price crisis of 2007–2008, many countries reacted to the rise in agricultural prices with noncooperative trade policies: increased taxes on exports, restrictions on export quantities and even export bans, and massive food purchases on world markets. These policies can be described as noncooperative insofar as they further fueled the rise in world prices, to the benefit of net exporting countries and the detriment of net importing countries (Bouët and Laborde 2012). Similarly in response to the COVID-19-related global crisis, some countries implemented restrictions on agricultural exports in April 2020 (see Chapter 5 of this report), but the extent and duration of their application were limited.

- In Africa, there have been border closures, particularly for individuals transporting small quantities of agricultural products, and increased sanitary controls on trucking. These measures have had a significant effect, particularly on informal trade of small quantities, which is a key economic activity for many poor African households, especially women. Some lessons emerge from this experience: If this cross-border trade is an important activity for many poor households, banning it without providing compensation is highly detrimental. Governments should either prohibit this trade but provide full compensation for the households involved through social transfers, or devise less stringent measures at each border crossing that are nonetheless sufficient to limit the spread of the virus. Possibilities include systematic testing, quarantine of some individuals, systematic information given to people, and access to water and soap.

- The impact of the economic crisis has differed significantly across value chains. Transitional value chains — those operating from rural to urban areas intensive in unskilled labor, dominated by many small and medium enterprises, and operating in poorly integrated national or regional areas — have shown great fragility and have frequently been affected by containment or mobility restrictions implemented to control the virus. For example, curfews have been particularly costly for companies in these sectors, as they usually transport their fresh products at night to avoid excessive heat. Costs have been particularly high when cross-border transport was involved and curfew schedules were not coordinated across countries (see Chapter 5 of this report and Reardon, Swinnen, and Vos 2021). Modern, capital-intensive, and often vertically integrated value chains, that usually produce for export, have shown more flexibility and resilience. Thus, the transformation of production sectors from a structure based on contracting small farmers and selling mainly on the domestic market to a modern structure based on large, vertically integrated production units could both reduce poverty (Maertens and Swinnen 2009) and increase the resilience of food value chains.

- Digitalization of the agriculture and agrifood sector accelerated significantly in 2020. In Africa, this shift has primarily taken the form of e-commerce for the delivery of food products and meals. The private sector has, thus, shown its responsiveness and resilience. Unfortunately, there have been few initiatives in international agricultural trade due to regulatory restrictions on the origin of sellers on platforms (International Trade Centre 2020). In its Phase III, the AfCFTA agreement should include a protocol to harmonize digital economy regulations on the continent for accelerated development of cross-border e-commerce. Changing these regulations to make online cross-border trade easier would make food systems more resilient to future shocks.

- During 2020, many initiatives emerged to provide real-time tracking of the health and economic crisis: number of infections, number of deaths, economic activity (through cellular and/or satellite data), economic and health measures implemented by governments around the world, transfers to households via mobile phones, and so on. The availability of

real-time data has helped identify solutions by comparing the effects of different policies on health and on the economy. In short, data have certainly increased transparency and improved decision-making by politicians. Unfortunately, the production of official agricultural trade statistics in Africa is still poor, in terms of both statistical accuracy and timeliness. This report has highlighted the problem through two cases: First, statistical knowledge about the meat and dairy sector in Africa is very limited, even though these products are clearly central to food security and nutrition, employment, income, and purchasing power. Second, statistical knowledge of informal trade in agricultural products more broadly is weak, despite a growing number of initiatives and the importance of the activity for livelihoods. A continental-level initiative is needed to better reflect trade in livestock as well as other agrifood sectors.

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