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BEYOND A MIDDLE INCOME AFRICA:

Transforming African Economies
for Sustained Growth with Rising
Employment and Incomes

Edited by

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Established in 2006 under the Comprehensive Africa Agriculture Development Programme (CAADP), the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) supports efforts to promote evidence and outcome-based policy planning and implementation. In particular, ReSAKSS provides data and related analytical and knowledge products to facilitate CAADP benchmarking, review, and mutual learning processes. The International Food Policy Research Institute (IFPRI) facilitates the overall work of ReSAKSS in partnership with the African Union Commission, the NEPAD Planning and Coordinating Agency (NPCA), leading regional economic communities (RECs), and Africa-based CGIAR centers. The Africa-based CGIAR centers and the RECs include: the International Institute of Tropical Agriculture (IITA) and the Economic Community of West African States (ECOWAS) for ReSAKSS–WA; the International Livestock Research Institute (ILRI) and the Common Market for Eastern and Southern Africa (COMESA) for ReSAKSS–ECA; and the International Water Management Institute (IWMI) and the Southern African Development Community (SADC) for ReSAKSS–SA.

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Abbreviations

AICD	African Infrastructure Country Diagnostic	FDI	Foreign Direct Investment
AIDA	Accelerated Industrial Development of Africa	GDP	Gross Domestic Product
AMU	Arab Maghreb Union	GE	Government Effectiveness
ASD	Africa Sector Database	GFSF	Global Futures and Strategic Foresight
ATOR	Annual Trends and Outlook Report	GGDC	Groningen Growth and Development Centre
AU	African Union	GMM	Generalized Method of Moments
AUC	African Union Commission	GNI	Gross National Income
BRICS	Brazil, Russia, India, China, and South Africa	GVCs	Global Value Chains
CAADP	Comprehensive Africa Agriculture Development Programme	HIPC	Heavily Indebted Poor Countries
CAP	Common African Position	ICTs	Information and Communication Technologies
CC	Control of Corruption	IFAD	International Fund for Agricultural Development
CCAFS	CGIAR Research Program on Climate Change, Agriculture, and Food Security	IFPRI	International Food Policy Research Institute
CEN-SAD	Community of Sahel-Saharan States	IGAD	Intergovernmental Authority on Development
COMESA	Common Market for Eastern and Southern Africa	IITA	International Institute of Tropical Agriculture
CRU	University of East Anglia Climatic Research Unit	ILRI	International Livestock Research Institute
DFID	UK Department for International Development	IMF	International Monetary Fund
DHS	Demographic and Health Survey	IMPACT	International Model for Policy Analysis of Agricultural Commodities and Trade
EAC	East African Community	IWMI	International Water Management Institute
EAP	East Asia and Pacific	JSR	Joint Sector Review
ECCAS	Economic Community of Central African States	LAC	Latin America and Caribbean
ECOWAS	Economic Community of West African States	LSMS-ISA	Living Standards Measurement Study-Integrated Surveys on Agriculture
FAO	Food and Agriculture Organization of the United Nations	MDG	Millennium Development Goal
FAPRI	Food and Agricultural Policy Research Institute	MENA	Middle East and North Africa
		MFAN	Ministry of Foreign Affairs of Netherlands

MIC	Middle-Income Country	SMS	Short Message Service
MVA	Manufacturing Value-Added	SSA	Africa south of the Sahara
MVAPC	Manufacturing Value-Added Per Capita	STI	Science, Technology, and Innovation
NAFSIP	National Agriculture and Food Security Investment Plan	UN	United Nations
NEPAD	New Partnership for Africa's Development	UNIDO	United Nations Industrial Development Organization
NPCA	NEPAD Planning and Coordinating Agency	USAID	United States Agency for International Development
ODA	Official Development Assistance	VA	Voice and Accountability
OECD	Organization for Economic Cooperation and Development	WDI	World Development Indicators
OWG	Open Working Group	WGI	Worldwide Governance Indicators
PGI	Poverty Gap Index		
PICI	Presidential Infrastructure Championing Initiative		
PIDA	Programme for Infrastructure Development in Africa		
PRSP	Poverty Reduction Strategy Paper		
RECs	Regional Economic Communities		
ReSAKSS	Regional Strategic Analysis and Knowledge Support System		
RL	Rule of Law		
RML	Reuters Market Light		
RQ	Regulatory Quality		
SADC	Southern African Development Community		
SAP	Structural Adjustment Program		
SDGs	Sustainable Development Goals		
SIDA	Swedish International Development Cooperation Agency		
SME	Small and Medium-Sized Enterprise		

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Foreword

Africa has witnessed rapid and persistent growth since the turn of the century, which has created real hope for greater economic and social progress throughout the continent. Never in the continent's post-independence history have so many countries reached and sustained per capita growth rates of this magnitude for nearly two decades now. During this period, overall gross domestic product (GDP) has doubled, and GDP per capita has increased by more than a third.

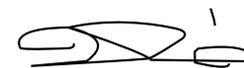
This welcome change is taking place after a long period of weak economic performance, which created a significant backlog of policy, institutional, infra-structural, and social challenges. Therefore, not only is it imperative to maintain the strong pace of growth into the decades to come, but even more critical is the need to ensure that future growth is broad based and inclusive for shared prosperity, as envisaged in the Africa Agenda 2063. Future growth needs to create ample employment and strong income gains for the most vulnerable segments of the population.

Just one year ago, we celebrated the 10th anniversary of the Comprehensive Africa Agriculture Development Programme (CAADP) within the same period of the 50th anniversary of the Organization of African Unity/African Union under the theme Pan Africanism and African Renaissance. Africa's heads of state and government met in Malabo, Equatorial Guinea, to salute the progress that has been achieved, renew their commitment to the CAADP agenda, and define more ambitious targets in what is known as the Malabo Declaration on Accelerated Africa Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods, to further advance the transformation of the continent's agriculture sector and broader economy. The Regional Strategic Analysis Knowledge Support System (ReSAKSS) 2014 Annual Trends and Outlook Report and its feature topic could not have come at a more appropriate time. Now is the time to look forward and reflect on the desired structure and trajectory of future growth leading to a more prosperous African continent that has eliminated hunger and significantly reduced poverty and become a dynamic force in the global arena as per the vision of the African Union.

This report and the 2015 ReSAKSS Annual Conference will make a valuable contribution toward deepening our understanding of the key drivers of the recent growth performance, the nature of the economic transformation process that is taking place, the fundamental changes occurring in a wide range of sectors, including agricultural value chains, and the considerable opportunities arising from rapid urbanization, a growing middle class, the youth dividend, and changes in the global economy.



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Director for Africa
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Executive Summary

Today, Africa is the second-fastest-growing region of the world, second only to Asia. The continent has managed to sustain strong economic growth since the mid-1990s to early 2000s. In particular, growth in gross domestic product (GDP) for the continent as a whole increased from 3.9 percent in 1995–2003 to 5.2 percent in 2003–2012 (ReSAKSS 2015). Meanwhile, gross national income per capita for Africa south of the Sahara (SSA), averaged 2.3 percent during 2004–2014 compared with 1.3 percent in the prior decade (World Bank 2015). The improved growth has been attributed to general improvements in macroeconomic management, increased investments, and favorable agricultural commodity and oil prices, which enabled strong export growth, particularly in low-income and oil-exporting countries (IMF 2013).

Despite the recent strong growth, challenges remain. The growth has not been sufficiently broad based or lasted long enough so as to lift the majority of the poor out of poverty, raise their incomes, and provide them with adequate employment opportunities. Thus, Africa as a whole will not meet the first millennium development goal of halving poverty and hunger by 2015, as declines in poverty and hunger have been slow. And although about half of African countries are classified as middle income, a large proportion of the poor lives in these countries. Therefore, it is imperative to not only sustain but also accelerate the current growth process. More important is the urgent need that, while doing so, policies and programs

be crafted so as to ensure that countries do not fall into a middle-income trap characterized by faster growth but with low employment creation and lingering poverty. Therefore, the goal should be to aim beyond achieving middle-income status and to create the necessary conditions to significantly improve the economic well-being of all segments of the population.

The strategic choices facing African countries are important and complex, in light of the major developments occurring across the continent. These developments present both challenges and opportunities and include rapid urbanization, a growing middle class, the rapid rise in the young population entering the labor force, the effects of climate change, and the increased volatility of global food and energy prices.

In this context, the 2014 Annual Trends and Outlook Report examines both current and future trends that are likely to shape the trajectory of African economies. It investigates the drivers behind the recent growth recovery, the nature and pattern of structural transformation among African economies, past strategies and future outlook for industrialization, the changes occurring in agrifood systems, and the role of major infrastructure sectors in the continent's past and future growth. The report also analyzes major global- and continental-level trends that may shape future growth across the continent and affect the region's integration into global value chains.

Major Findings and Recommendations

Africa will experience more sustained economic growth in GDP per capita between now and 2030 and 2050. In addition, most African countries that are currently low income will graduate to middle income by 2030, and all but Eritrea will achieve middle-income status by 2050. At present, all of northern Africa and half of southern African countries are middle income, while the majority of countries in western, central, and eastern Africa are low income.

Production of fruits and vegetables, oilseeds, pulses, and roots and tubers in Africa is each projected to more than double between now and 2050, while cereals will increase by 91 percent. Cereal production, in particular, is projected to continue growing strongly at about 2 percent per year until 2030, and slowing to just more than 1 percent per year in the last half of the projection period to 2050. However, climate change will reduce total production by 6–12 percent by 2050 in all major subregions, except East Africa.

Demand for cereals, oilseeds, and roots and tubers is projected to more than double by 2050, while total consumption of pulses, fruits, and vegetables is projected to triple by 2050. These projected increases are in line with projected increases in per capita incomes and population. In terms of net trade, local production in Africa will be insufficient to meet the growing food demand, which will need to be met through net imports. By 2050, SSA is projected to be a net importer of half of all available net global exports, especially cereals. Nonetheless, in a few cases due to its comparative advantage, North Africa is projected to be a consistent net exporter of fruits and vegetables. Climate change will have a minimal impact on Africa's net trade.

Climate change will make cereal prices 25 percent higher in 2050, compared with a no climate change scenario. This represents a price level of 50 percent higher than current prices of 2010. Fruits and vegetables, pulses, and roots and tubers are projected to encounter a 9–12 percent increases in global commodity prices compared with a no climate change scenario, representing prices that about 26–38 percent higher than 2010 prices. While price increases will represent an opportunity for net suppliers of agricultural products who can supply global markets, they will be a huge challenge for net consumers.

Drivers of change or megatrends that are likely to influence the trajectory of African economies include more volatile food and energy prices; rapid urbanization, increasing incomes, and the rise of a middle class; rapid increase in a young population entering the labor force; greater climate variability; and agriculture remaining as the largest source of employment. Many of these trends are highly dependent on other underlying processes that may or may not occur. Some of the key trends currently shaping African food systems many continue only for a limited period. This is because these trends are part of a system that co-evolves with related processes that may take on new trajectories, and some can be changed by policy action. The creation of new jobs in the nonfarm economy is unlikely to grow fast enough to absorb the rapidly growing young population. Thus, agriculture remaining the single largest source of employment, despite the rise in nonfarm jobs, is a megatrend likely to be seen for decades to come.

The speed and intensity of many megatrends are highly reliant on policy and public investments, and thus can be altered through public action. For instance, countries can (1) invest in the education value chain to upgrade the skills of those entering the labor force; (2) implement policies

to promote broad-based agricultural growth, including investments in research and development; (3) invest in physical infrastructure to reduce the costs of production in both industry and agriculture, and thus promote competitiveness and employment opportunities; (4) introduce an industrial policy that promotes synergies between the nonfarm sector and agrifood systems; (5) invest in urban planning in anticipation of an increasing proportion of Africa's population that will live in urban areas in the coming decades; and (6) mobilize adequate funding to finance these various investments and leverage complementary private sector-investments.

African diets are changing in response to rapid urbanization and the rise of a middle class. The share of population living in urban areas in Africa has caught up to that of other developing regions, and continues to increase rapidly; 50 percent of Africa's population is projected to live in urban areas by 2020. The middle class is also growing rapidly, more than doubling between 1990 and 2010. The emergence of a middle class, increasing incomes, and the changes in employment profiles of both men and women are contributing to changes in diets. Survey results from countries in eastern and southern Africa show that processed food now represents a significant share of food purchases, even for the rural poor. Diets have also diversified beyond grains into horticulture, dairy, livestock, fish, and pulses. Much of the dietary change occurs early in the income distribution, as poor people experience rising incomes and become less poor—not just when they move up to the middle class. Domestically produced food, rather than imports, accounts for the bulk of diets in both urban and rural areas.

Dietary changes are leading to rapid changes in the midstream (post-farmgate) segments of food supply chains. Accompanying these changes has been the emergence of a “quiet revolution in African food supply

chains,” led mainly by small- and medium-scale enterprises operating in midstream and downstream segments of food processing, wholesale, retail, and transport. The midstream and downstream segments account for 40–70 percent of food costs of urban consumers, suggesting that these segments can play important roles in ensuring food security. Food supply chains have vastly increased in volume: it is estimated that the volume of marketed food has increased by around six times over the past 40 years, and particularly in the last 20 years. Examples of these food supply chains include the proliferation of small mills and retail outlets selling teff flour in Addis Ababa, Ethiopia; the expansion of domestic firms producing branded maize meal in Dar es Salaam, Tanzania; the rapid transformation of the chicken supply chain in Nigeria; and the rise of processed millet-based products in Dakar, Senegal. These changes are increasing opportunities for rural nonfarm employment and allowing farmers to increase their incomes. However, many of these new midstream agribusiness enterprises are not yet performing up to their potential. Improving their performance and the business climate will require investments in infrastructure, including markets, energy, roads, and policy reforms.

Africa's growth recovery represents a remarkable achievement, but has not been sufficient to make up for the stagnation and decline of earlier decades. In the last decade and a half, Africa has experienced much faster growth than in previous decades, during which GDP per capita grew slowly or even declined. Similar patterns are seen in the growth rates of labor productivity and agricultural labor productivity, each of which grew more rapidly during the 2000s than during any previous decade since the period of independence. However, the recent growth has not been enough to allow African countries to make up for the “lost decades” of the 1970s–1990s. At

the current pace of growth, it would take many more decades for countries to reach the levels they would have achieved if they had maintained their growth rates of the 1960s. More needs to be done to sustain and deepen the current recovery, to allow Africa to catch up to its own potential and the rest of the world, and to quicken its pace of poverty reduction.

The drivers of growth during Africa's recent recovery include macroeconomic stability, improvements in governance and human capital, and increased financing. The factors responsible for Africa's recent growth include more moderate inflation; improvements in the rule of law and control of corruption; increases in life expectancy and schooling; and increases in foreign direct investment, savings, and development assistance. In the past, shifting and inconsistent policy regimes were not successful in achieving development aims. However, more recently, widespread reforms across the continent that created more open political systems and more private-sector-friendly economic policies have contributed to the turnaround in growth. During the recovery period, in contrast to previous decades, countries rich in natural resources seem to have managed resource revenues adequately to avoid negative macroeconomic consequences; however, continued attention to prudent management is needed. African countries must continue their efforts to maintain macroeconomic stability and further improve institutions and governance to sustain the growth recovery.

Despite being delayed over the last several decades, structural change in Africa has made a turnaround and is now contributing to productivity growth. Structural change is a common feature of the development process, in which labor migrates from lower- to higher-productivity sectors, thereby increasing average productivity. However, in Africa, structural change reduced productivity in the decades following

independence until about the turn of the century, as labor exited the agriculture sector for even lower-productivity sectors. During this period, the negative transformation experienced was the result of labor migrating out of a slow-growing agriculture sector into a rapidly expanding services sector dominated by an informal subsector with declining productivity levels. However, during the first half of the 2000s, structural change began to operate in Africa as in other regions, contributing positively to economywide productivity growth. For example, structural change contributed positively to overall labor productivity growth in 17 out of a sample of 19 African countries for which data are available. The positive transformation process is a reflection of the recent strong economic growth Africa has been witnessing, which needs to be sustained and accelerated.

Africa's informal goods and services sector is increasingly prominent, and must play a major role in future growth strategies. Much of the labor exiting agriculture is entering the rapidly growing informal goods and services, or "in-between," sector. The in-between sector and the domestic demand it serves contributed significantly to the recent recovery, as demonstrated by the fact that the majority of countries with positive growth in the past decade experienced even faster growth in the services sector, much of it informal, than in overall GDP. Therefore, industrial development strategies must go beyond traditional manufacturing to target growth and modernization in the in-between sector. Unlike the experience of other major developing regions, Africa's informal goods and services sector will play a major role in future growth and industrialization. The sector is currently dominated by small enterprises producing a large number of low-quality domestic goods. Throughout Africa, enterprises in the informal sector have tended to invest less than similar firms in other

regions in physical and human capital, and the majority of them have been unable to increase their productivity and profitability and to expand in size. A number of strategies, including management training and other targeted capacity building for firms, as well as investments in infrastructure and policy actions to address constraints related to access to finance and property rights, will be called for to allow informal enterprises to expand employment, create wealth, and contribute to poverty reduction.

Industrialization in Africa has been weak, and has contributed little to Africa's recent growth. Despite some progress, as pointed out earlier, Africa's recent growth has not been accompanied by significant structural transformation, nor has it been inclusive enough to generate remunerative employment opportunities for the continent's rapidly growing young population. Furthermore, past industrial policies and strategies have been weak and inconsistent for several reasons, including inadequate and poor infrastructure, weak institutional capacity, a shortage of skills (managerial and technical), and poor investment in supportive key sectors, such as agriculture.

A new industrial strategy is fundamental to deepening Africa's structural transformation, inclusive growth, and development. Most cases of high and sustained economic growth in modern times have been associated with industrialization, especially manufacturing. A new industrial strategy will need to focus on investing in infrastructure (especially energy, transport, and water supply); creating an enabling business environment where the state plays a facilitating role and ensures sound policies and regulations that promote private-sector development and participation; and safeguarding macroeconomic and political stability, sound institutions, and secure property rights. To actively participate in the production of high-value-chain goods, Africa will need to invest in science,

technology, and industrial training, including research and development. This will need to be supplemented by policies and strategies that support development of skills in manufacturing and promote science and technology and innovation, which are so critical for enhancing productivity. Moreover, an enabling business environment will go a long way in helping to create industrial partnerships—through, for example, South–South trade—that can help to finance industrialization.

Africa lags behind other developing regions in having adequate access to infrastructure, particularly rural telecommunications, electrification, rural roads, water, and sanitation. This lack of progress is in spite of growing empirical evidence showing the positive impact of infrastructure access on reducing poverty and income inequality. To illustrate Africa's lagging behind, the average density of paved roads on the continent is 21 kilometers per square kilometer (km/km²), compared with 134 km/km² in other-low income regions, while Africa's electricity consumption is a tenth of that found in other parts of the developing world. The infrastructure gap, poor infrastructure services, and implied high costs have had detrimental effects on domestic private investment and foreign direct investment on the continent, as well as on the productivity and competitiveness of African farmers and businesses.

Substantial investments are required to reduce the infrastructure gap faced by Africa, with most estimates suggesting a doubling of current infrastructure expenditures to the tune of about US\$93 billion a year. Including the costs of operations and maintenance would entail a tripling of Africa's current infrastructure expenditure to about 9–15 percent of gross domestic product on average. The largest investments are needed in the power sector, followed by the water and sanitation and transport sectors, respectively.

In addressing the infrastructure gap and given the significant budget and absorption constraints they face, African governments and their partners need to first carefully assess and prioritize required investments. They will also need to closely coordinate different infrastructure investments to maximize complementarities among the investments. Coordination and integration of infrastructure investments at the regional level will be critical to exploiting regional synergies and economies of scale. Moreover, public-private partnerships will need to be forged, as they appear to present the most efficient means of closing Africa's infrastructure gap. And finally, reforming institutional governance and accountability mechanisms is key to ensuring that increased resources from both private and public sources are used efficiently and effectively.

CHAPTER 1

Introduction



With the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods, African leaders not only recommitted to the goals and principles of the Comprehensive Africa Agriculture Development Programme (CAADP), recognizing the central importance of agriculture in producing the broad-based growth needed to reduce poverty and hunger. They went beyond the original targets of agriculture sector growth and public expenditure to define a broader and more transformative agenda with clear commitments in such areas as trade, employment, youth, gender, nutrition, and resilience. The Malabo Declaration also expanded on the principle of mutual accountability by instituting a biennial review process.

As the official monitoring and evaluation report for CAADP at the continental level, the Annual Trends and Outlook Report (ATOR) plays an important role in promoting mutual accountability in support of evidence-based policymaking. The 2014 ATOR is the first to report on the new indicators called for in the CAADP Results Framework 2015–2025, which was developed to provide a set of parameters for tracking progress toward the Malabo Declaration commitments.

As in previous ATORs, this report also presents analysis on a feature topic of strategic importance to the CAADP agenda. This year, the ATOR examines trends and issues related to future growth prospects, in particular the transition of African economies to middle-income status, in light of the progress made by many countries, as well as in response to the Malabo ambitions. The report reviews the strategies and factors that have constrained income growth in the past and have encouraged it more recently, and provides recommendations for building on the current

recovery and future opportunities for ensuring sustained and inclusive growth.

After several decades of agricultural and economic stagnation and decline, the past 20 years have seen a remarkable growth recovery. Today Africa is the world's second-fastest-growing region, and a growing group of African countries have reached middle-income status. However, poverty and hunger remain unacceptably high, including in many middle-income countries. The challenge in the future is to sustain and accelerate the growth recovery and at the same time to broaden growth to ensure stronger impacts on poverty. This will require multifaceted action to respond to challenges and opportunities on a number of fronts, including increasing agricultural productivity and improving market access, generating productive employment opportunities for the large number of youths entering the workforce, and providing domestic agribusiness and other informal firms with the support needed to innovate and grow. Governments must create an enabling environment for growth by investing in education and infrastructure, maintaining macroeconomic stability, and redoubling efforts to improve governance and institutions.

The 2014 ATOR discusses these issues in eight thematic chapters in addition to the regular review of progress in reaching CAADP-related targets and goals and in implementing CAADP. The chapters provide complementary analyses of past and current trends and opportunities related to Africa's growth trajectory and its efforts to achieve broad-based economic growth in more countries. The analysis begins with an examination of likely future growth and development outcomes based on models of agricultural growth and climate change. The report then explores the impacts of trends, including urbanization, income growth, dietary change, and growing

agribusiness opportunities. Other chapters explore the drivers of growth and the nature of structural transformation in Africa, as well as implications for sectoral development and industrialization today.

Chapter 2 of the report uses the International Food Policy Research Institute's International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) to project potential growth and other outcomes over the next several decades. The chapter discusses trends in agricultural production, food demand and consumption, agricultural commodity prices, and hunger, and examines the likely impacts of climate change on each of these areas. The chapter also evaluates an alternative scenario of accelerated GDP growth sufficient to raise almost all countries to middle-income status by 2030, and the resulting impacts on consumption, trade, and hunger.

Chapter 3 describes eight “megatrends” that are likely to influence the future structure of agriculture and food systems in Africa, and evaluates the differing extents to which these trends can be influenced by government policy action. The chapter then outlines four scenarios that may develop based on the evolution of two important trends—global food prices and the equity of urban income growth—and evaluates their effects on different population groups.

Chapter 4 examines the implications of rapid urbanization and the growth of a middle class for dietary change, and the consequent impacts on food value chains and the growth of domestic agribusiness. The chapter describes four illustrative value chains in different regions of Africa that demonstrate the rapid rise in domestic processing and marketing firms and the transformation of food value chains leading to urban consumers, and provides recommendations for policy action to help these firms meet their potential.

Chapters 5 and 6 examine past trends in Africa's growth and their implications for future strategies. Chapter 5 reviews the nature of Africa's recovery and examines whether it has enabled African countries to make up the ground lost during previous periods of stagnation. The chapter also evaluates whether Africa's recent growth has led to income convergence among African countries, with poorer countries catching up to richer countries. Africa's past six decades of shifting development strategies are reviewed and contrasted with the economic and agricultural reform processes undertaken by economies that have successfully transitioned into middle-income status, using the example of China. Finally, the chapter performs an empirical analysis examining which factors are responsible for the improved performance of the past few decades.

Chapter 6 reviews the characteristics of structural transformation in Africa compared with patterns in the rest of the world, and explores changes in the nature of structural transformation over time and their implications for current and future trends in poverty. The chapter then describes the rapid growth of the informal goods and services sector, or “in-between” sector, its importance as a reservoir of low-productivity labor, and its role in the current growth recovery and future growth strategies. The chapter provides recommendations for development strategies targeting modernization of the sector to promote enterprise growth and creation and to unleash its important potential as a source of productivity growth and broad-based employment creation.

Chapter 7 outlines the importance of industrialization in the process of structural transformation for sustained and broad-based growth, and reviews the industrial strategies practiced by African governments over the last six decades. The chapter describes the foundations of a new industrial

strategy for Africa and provides recommendations for developing a strong private sector and financing industrial development.

Chapter 8 reviews evidence on the effects of infrastructure on poverty and other development outcomes, with a focus on roads, electrification, water, and information and communication technologies. It outlines the current state of these categories of infrastructure, as well as the level of investment required to adequately expand infrastructure access. The chapter makes recommendations for prioritizing and financing infrastructure investments, for integrating infrastructure at the regional level, and for improving governance and accountability with regard to infrastructure management.

Chapter 9 tracks progress on 15 of the 40 indicators of the new CAADP Results Framework, in the areas of economic growth, food and nutrition security, poverty, agricultural production and productivity, and public agriculture sector expenditure. The remaining indicators will be tracked in subsequent ATORs, as data sources are identified and methodologies established. The chapter also reviews progress in the CAADP implementation process in African countries.

The last chapter concludes by summarizing findings of the report and presenting recommendations and implications for the CAADP agenda. Finally, the report's appendixes provide data on the 15 Results Framework indicators for each geographic region of Africa, as well as for Regional Economic Communities, countries grouped by economic characteristics, and countries grouped by the period during which they signed their CAADP Compact.



CHAPTER 2

Africa in the Global Agricultural Economy in 2030 and 2050¹

Timothy B. Sulser, Daniel Mason-D’Croz, Shahnila Islam,
Sherman Robinson, Keith Wiebe, and Mark W. Rosegrant²

¹ Data for—and therefore discussion of—Somalia and South Sudan are generally unavailable and not included in this chapter; also, small island nations are not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe).

² This chapter was supported by the Global Futures & Strategic Foresight (GFSF) project. GFSF is a CGIAR initiative led by IFPRI and funded by the Bill and Melinda Gates Foundation; the CGIAR Research Program on Policies, Institutions, and Markets (PIM); and the CGIAR Research Program on Climate Change, Agriculture, and Food Security (CCAFS). Many researchers beyond those listed as authors have contributed to the development, updating, and maintenance of the IMPACT model, without which this analysis would not be possible. The water components in IMPACT are managed by Tingju Zhu, Gauthier Pitois, and Claudia Ringler. Crop modeling is managed by Richard Robertson.

Africa on the Rise

Africa has managed to maintain a favorable environment for growth and poverty reduction in the face of the series of global economic crises in the past couple decades. Part of this is due to Africa's level of isolation from the global economy, but it is also testament to the resilience of African economies even if they are not experiencing the extraordinary growth seen in South and East Asia (AfDB, OECD, and UNDP 2015). Per capita gross domestic product (GDP) grew at a solid 2 percent per year in the decade leading up to 2012 across all of Africa, with western Africa leading at more

than 4 percent growth (ReSAKSS database 2015). This growth has put the average per capita GDP for all of Africa at the threshold of middle-income classification according to the World Bank's World Development Indicators. Eastern and central Africa lag behind a bit with many low-income nations, while the northern and southern regions are mostly represented by stronger middle-income economies.

Indicative of the health of the entire economy are the advances Africa has made in reducing the prevalence of undernourishment in children and in the general population. While northern and southern Africa have effectively achieved the Millennium Development Goal (MDG) of halving

FIGURE 2.1—DECLINE IN PREVALENCE OF UNDERNOURISHED CHILDREN IN RESAKSS REGIONS

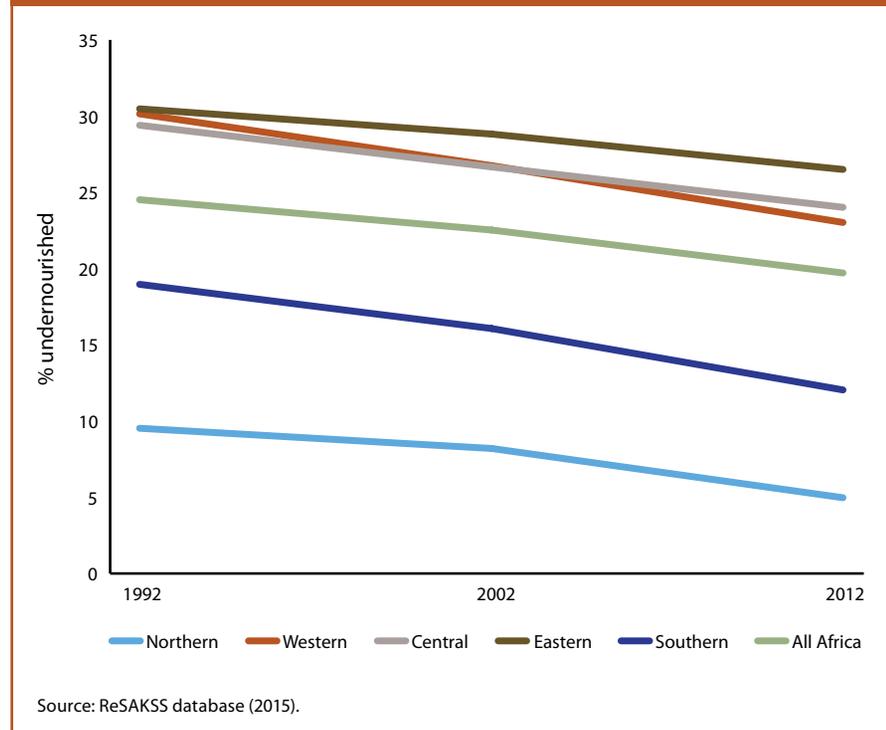
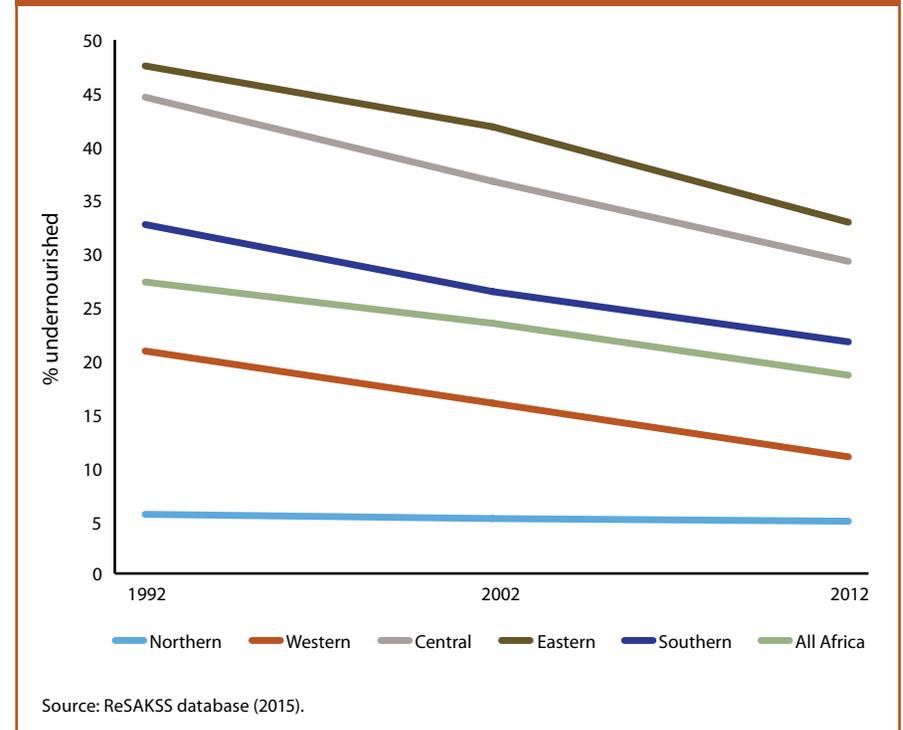


FIGURE 2.2—DECLINE IN PREVALENCE OF UNDERNOURISHED POPULATION IN RESAKSS REGIONS



the prevalence of undernourished children (age 5 and under, by weight), the other regions have been dealing with persistent challenges in this regard and keep the average across Africa at about 20 percent, still four-fifths of the prevalence two decades prior (Figure 2.1). Better progress can be found in the general population, however, with much steeper declines found in the trends, which are losing about a 0.5 percentage point off the prevalence rate per year in the decade leading up to 2012 across most African regions (Figure 2.2). Transitioning from progress made on the MDGs to a unified Common African Position regarding the Post-2015 Development Agenda, as put forth by the African Union, is a critical step in the process for advancing economic prosperity for the region (UNECA et al. 2014).

Broad growth and development in Africa will necessarily rely upon expansion across all economic sectors and a more equitable and considered approach to policymaking and investments across all domains of society. A balance must be made across genders and the youth, economic strata, urban-rural populations, and productive domains. Many of these topics are covered in subsequent chapters and other resources such as AfDB, OECD, and UNDP (2015); UNECA et al. (2014); and UNDP (2014).

Growth in African economies is rooted in a strong expansion of the agriculture sector, the reason for the focus on agricultural development by Comprehensive Africa Agriculture Development Programme (CAADP) and the Regional Strategic Analysis Knowledge Support System (ReSAKSS). Total value-added growth for agriculture has been in the 3–5 percent range for the five ReSAKSS regions³ for the 2003–2012 period and more than 5 percent across Africa. This is nearly reaching the CAADP target of 6 percent growth for the sector in aggregate (Table 2.1). The performance varies quite a bit

TABLE 2.1—HISTORY OF AGRICULTURE VALUE-ADDED GROWTH RATE (%) BY RESAKSS REGION

	Decade ending in	
	2002	2012
North	5.7	5.2
West	7.5	5.5
Central	1.9	2.8
East	4.0	4.8
Southern	6.4	4.8
All Africa	6.0	5.1

Source: ReSAKSS database (2015).
 Note: Based on World Bank's World Development Indicators definition of agriculture value-added. More explanation included with Figure 2.3.

at the country level, however, from as low as –4 percent up to +13 percent annual growth (ReSAKSS database 2015).

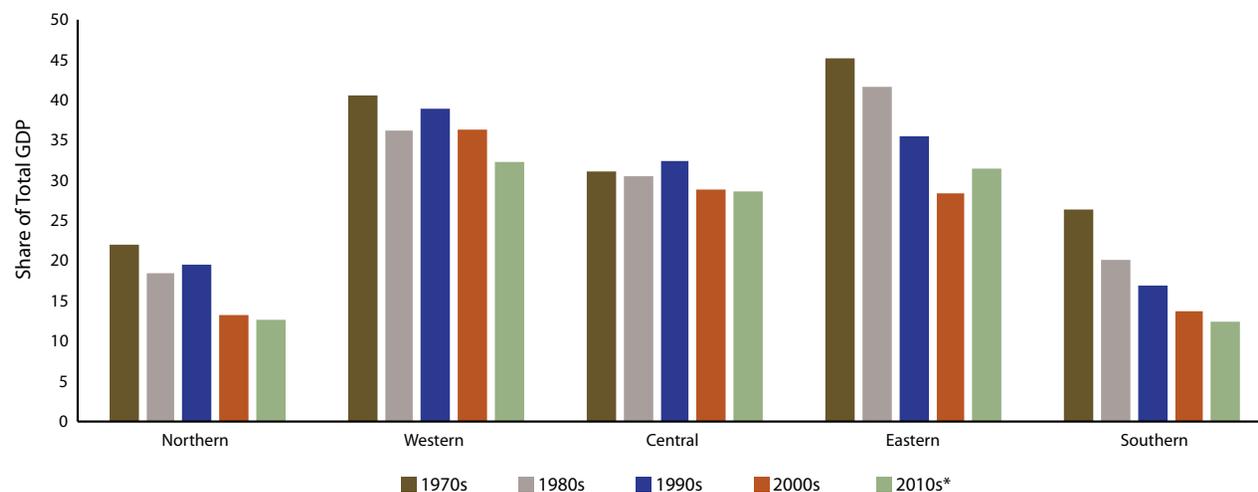
While the agriculture sector is contributing a decreasing share to the African economy as a whole, it remains an essential cornerstone for advances and development of the region. Indeed, without a strong basis in agriculture, it is difficult for developing economies to establish momentum for improving living standards (UNDP 2014). The trends in the shares of agricultural value-added in total GDP are declining but leveling off (Figure 2.3). However, this aggregate picture hides the diverse country-level trends that can be effectively flat (for example, Algeria, Benin, Guinea, and Zimbabwe) or even increasing in a few cases (for example, Chad, Central African Republic, and Sierra Leone). Also, decreasing contribution of agriculture to GDP may simply be a reporting issue as developing agro-industries often are counted as part of the industrial sector as they become more consolidated. Regardless, as countries

³ ReSAKSS follows the African Union's classification of Africa's five geographic regions (central, eastern, northern, southern, and western). ReSAKSS data and methodology are described in Benin et al. (2010).

develop, the agriculture sector maintains its magnitude of importance for rural regions where the majority of the poor reside. An equitable development strategy will maintain the profile of agriculture in the mix of economic growth for a country or region. Also, maintaining a flexible rural and agricultural economy that can absorb and support urban populations and the industrial and service sectors as they face increased exposure to global markets (and therefore its crises) has proven essential for developing economies of Southeast Asia, for example, which is a lesson that can be used to enhance Africa's resilience.

Primary growth of Africa's agricultural sector in aggregate has also been steady through the past several decades (Figure 2.4). The agriculture production index for Africa has been adding almost 4 percentage points per year on average in the decade leading up to 2012. This is effectively a doubling of the rate from the previous decade. Again, this varies across ReSAKSS regions, with the strongest

FIGURE 2.3—RESAKSS REGIONAL TRENDS OF COUNTRY AVERAGES FOR VALUE-ADDED AGRICULTURAL GDP AS SHARE OF TOTAL GDP

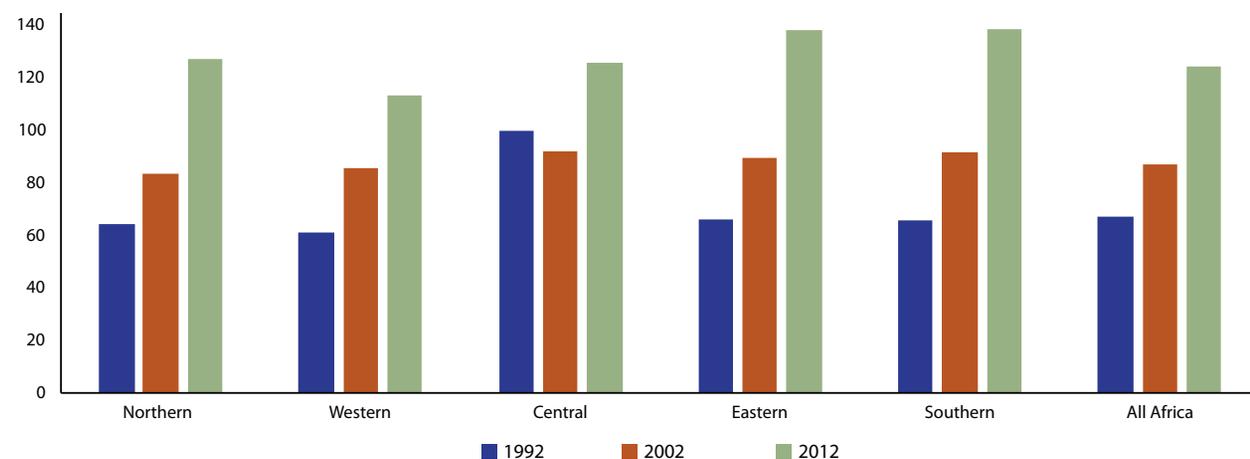


Source: World Bank (2015).

*Including latest available data.

Note on meaning of value-added: Agriculture corresponds to ISIC divisions 1–5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value-added is the net output of a sector after adding all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value-added is determined by the International Standard Industrial Classification (ISIC), revision 3

FIGURE 2.4—DEVELOPMENT IN RESAKSS REGIONAL AGRICULTURAL PRODUCTION INDEXES



Source: ReSAKSS database (2015).

growth in eastern and southern Africa. Central Africa made an important rebound from a decline in their production index in the previous decade.

Africa Moving Forward

Africa has a promising outlook for agricultural and economic development for the coming decades. To understand future prospects better, however, it is helpful to employ quantitative models that focus on setting a framework for foresight into key trends and developments over the medium and long term. Several types of these quantitative models can be used; this analysis uses the International Food Policy Research Institute's (IFPRI's) International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) (Rosegrant et al. 2012; Robinson et al. 2015), which is well established in the field of foresight work focused on the agricultural sector (Nelson et al. 2014; von Lampe et al. 2014).

IMPACT is a partial equilibrium agriculture sector model designed to examine alternative futures for global food supply, demand, trade, prices, and food security. The IMPACT model allows IFPRI to provide both fundamental, global baseline projections of agricultural commodity production and trade and malnutrition outcomes along with cutting-edge research results on quickly evolving topics such as bioenergy, climate change, changing diet and food preferences, and many other themes. A brief explanation of the IMPACT model is included in Box 2.1, but extensive documentation on the model and its application in the

BOX 2.1—THE INTERNATIONAL MODEL FOR POLICY ANALYSIS OF AGRICULTURAL COMMODITIES AND TRADE (IMPACT)

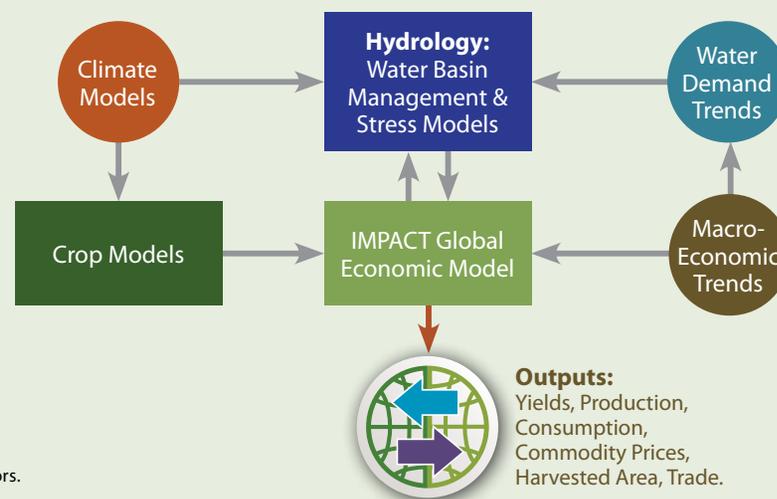
IMPACT models 62 agricultural commodity markets covering the majority of food consumed in the world, including varieties of grains, meat and dairy, roots and tubers, pulses, oils, fruits, and vegetables along with several cash crops. Irrigated and rainfed crop production is spatially disaggregated and modeled at the subnational level in 159 countries crossed with 154 major water basins to comprise 320 food production units (FPUs) around the globe.

Commodity production is driven by both economic and environmental factors and has both extensive and intensive components (area x yield) along with accounting for the presence of irrigation (irrigated and rainfed production) and exogenous technological change. Water use and climate change are modeled via coupled models that represent these complex components with extraordinary detail. World food prices are determined annually at levels that clear international commodity markets using iterative, year-by-year demand and supply equilibration while tracking details on physical use of land and water.

Demand is decomposed into major consumption sectors (food, feed, biofuels, and other). Food demand is a function of commodity prices, income, and population, while feed demand depends on the level of livestock production, feed prices, and feeding efficiencies. Biofuel demand is an exogenous calculation of demand for feedstock from different commodities to meet mandates in major consuming and producing countries. Other demand, mostly from the industrial sector, changes proportionally to food and feed demand and in line with growth in country GDP.

Scenario analysis of alternative futures relevant for informing the policymaking process can be done along nearly any dimension that is explicitly defined within IMPACT. Output indicators available for analysis across the baseline and alternative scenarios include calorie availability, malnutrition measures, share at risk of hunger, and water consumption along with the standard components of production, consumption, and trade from the agricultural sector.

FIGURE 2B.1—IMPACT MODEL SCHEMATIC



Source: Authors.

future scenarios analysis can be found in Rosegrant et al. (2012), Robinson et al. (2015), and via the IMPACT website (<http://www.ifpri.org/program/impact-model>).

Baseline

The foundation of analysis in the IMPACT model is in the baseline that is aligned and calibrated with the latest outlooks on demand and supply in agricultural and related sectors. Key drivers of the demand side include population and income (and the subsequent per capita GDP) that IMPACT takes as exogenous assumptions from the SSP2⁴ specification commonly used by modeling groups around the world to represent an “average” progression of current and expected trends. The demand side represented in IMPACT includes commodity-specific elasticities that evolve the consumption patterns in line with trends in income, price trajectories, and changes in tastes and preferences at the country level.

One of the IMPACT model’s most important features is the extraordinary detail represented in the technical coefficients across several dimensions for production and supply of agricultural commodities. The baseline includes a “business-as-usual,” plausible outlook of trends that affect supply according to yield and area growth; explicit modeling of water availability in agricultural systems and water use by the various sectors of society; and climate effects on crop productivity, among other elements.

One of the key questions addressed in this report is focused on the progression toward a middle-income Africa. In Table 2.2 is the breakdown by global and African regions of the expected trends in per capita GDP to 2030 and 2050. The exceptional growth in per capita GDP in South and East Asia

TABLE 2.2—BASELINE (SSP2) PER CAPITA GDP TRENDS, US\$1,000, CONSTANT YEAR 2005

	2010	2030	2050
East Asia & Pacific	8.81	22.34	35.41
South Asia	2.74	6.98	13.88
Middle East & North Africa	9.96	17.09	26.04
SSA	1.97	3.81	7.79
Latin America & Caribbean	10.01	16.94	25.85
Former Soviet Union	10.23	21.38	32.40
Europe	27.23	36.24	48.15
North America	41.49	56.72	66.52
World	9.82	17.29	25.19
ReSAKSS-North	6.23	12.26	22.16
ReSAKSS-West	1.70	3.88	8.60
ReSAKSS-Central	1.22	2.35	5.63
ReSAKSS-East	1.22	2.59	6.13
ReSAKSS-Southern	4.79	7.94	12.00
AMU	6.87	13.15	21.89
CENSAD	2.65	5.34	10.70
COMESA	2.05	3.97	8.25
EAC	1.23	2.69	6.26
ECCAS	1.72	2.99	5.90
ECOWAS	1.70	3.88	8.60
IGAD	1.26	2.63	6.19
SADC	2.83	4.71	8.10

Source: IIASA (2015).

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

⁴ SSP2: Shared socioeconomic pathways are coordinated sets of projection for GDP and population growth used in the economic modeling community for foresight analysis (Chateau et al. 2012; O’Neill et al. 2014).

TABLE 2.3—BASELINE (SSP2) PER CAPITA GDP CLASSIFICATION AND TRANSITIONS

		2010	2030	2050			2010	2030	2050	
ReSAKSS-North	Mauritania	L-Mid	L-Mid	U-Mid	ReSAKSS-East	Eritrea	Low	Low	Low	
	Morocco	L-Mid	U-Mid	U-Mid		Madagascar	Low	Low	L-Mid	
	Algeria	U-Mid	U-Mid	U-Mid		Ethiopia	Low	L-Mid	U-Mid	
	Egypt	U-Mid	U-Mid	U-Mid		Kenya	Low	L-Mid	U-Mid	
	Tunisia	U-Mid	U-Mid	High		Rwanda	Low	L-Mid	U-Mid	
	Libya	U-Mid	High	High		Sudan	Low	L-Mid	U-Mid	
ReSAKSS-West	Liberia	Low	Low	L-Mid		Tanzania	Low	L-Mid	U-Mid	
	Mali	Low	Low	L-Mid		Uganda	Low	L-Mid	U-Mid	
	Niger	Low	Low	L-Mid		Djibouti	L-Mid	L-Mid	U-Mid	
	Sierra Leone	Low	Low	L-Mid		ReSAKSS-Southern	Malawi	Low	Low	L-Mid
	Togo	Low	Low	L-Mid			Zimbabwe	Low	Low	L-Mid
	Benin	Low	L-Mid	L-Mid			Lesotho	Low	L-Mid	U-Mid
	Burkina Faso	Low	L-Mid	U-Mid			Mozambique	Low	L-Mid	U-Mid
	Ghana	Low	L-Mid	U-Mid			Zambia	Low	L-Mid	U-Mid
	Guinea	Low	L-Mid	U-Mid	Angola		L-Mid	U-Mid	U-Mid	
	Guinea-Bissau	Low	L-Mid	U-Mid	Swaziland		L-Mid	U-Mid	U-Mid	
	Senegal	Low	L-Mid	U-Mid	Namibia		U-Mid	U-Mid	U-Mid	
	The Gambia	Low	L-Mid	U-Mid	Botswana		U-Mid	U-Mid	High	
	Côte d'Ivoire	Low	U-Mid	U-Mid	South Africa		U-Mid	U-Mid	High	
	Nigeria	L-Mid	L-Mid	U-Mid						
ReSAKSS-Central	Burundi	Low	Low	L-Mid						
	Central African Rep.	Low	Low	L-Mid						
	Congo, Dem. Rep.	Low	Low	L-Mid						
	Cameroon	Low	L-Mid	U-Mid						
	Chad	Low	L-Mid	U-Mid						
	Congo, Republic	L-Mid	U-Mid	U-Mid						
	Gabon	U-Mid	U-Mid	High						
	Equatorial Guinea	High	High	High						

Source: IIASA (2015) and World Bank (2015) income level classifications.
 Note: L-Mid= Lower-middle income, U-Mid= Upper-middle income.

will sharply decline over the latter half of the projection period, while Africa will see a more sustained growth—if at a lower rate—throughout the modeled time horizon. Table 2.3 shows the evolution of African nations through the modeled time horizon from low to lower-middle, upper-middle, and high-income classifications. Northern Africa is already fully middle income, while half of the southern African countries are in a similar state. The majority of nations in western, central, and eastern Africa are currently low income. Even in this baseline SSP2 specification, however, most of the countries currently of low-income status will graduate to middle income by 2030, and all except Eritrea will achieve this by 2050. We have included here a quick scenario assessment of increased GDP growth that would accelerate African income growth (see below).

Climate Change to 2050

It is important to note that calibration of the baseline happens in an environment absent of climate change effects (referred to as NoCC). The NoCC environment serves as a base that helps in the assessment of climate change impacts on production activities. However, given that previous assumptions about the impacts of climate change are already being seen in real-world results, the NoCC scenario is clearly implausible. Nonetheless, NoCC remains a useful reference case of interest to policymakers who often need to address the issue of mitigating climate impacts with stakeholders. However, this analysis employs four updated climate change representations—used widely in the modeling community—as major drivers for calculating a primary, plausible reference scenario, the *baseline climate change* (BSLN-CC).⁵ The BSLN-CC shows the average climate impacts across

these core climate change scenarios. There is significant uncertainty involved in the science of determining future climate scenarios, which necessitates the use of a suite of climate representations such as the one used here. Across the climate models, however, a few take-home messages are clear:

The climate is warming, which means:

1. increased moisture in the atmosphere and therefore increased rainfall on average across the global landscape;
2. this rainfall will occur in more intensive events and not necessarily according to previous seasonal patterns (the precise effects at any given location, however, may fall anywhere on the drier-to-wetter or warmer-to-cooler spectra); and finally,
3. the general trends indicate that temperate regions may benefit slightly from climate change while the tropics are expected to suffer worsening conditions (Nelson et al. 2010).

The primary effect of climate change in the IMPACT model is through changes in crop yields. These impacts are estimated through a set of linked biophysical crop models that simulate crop growth in the baseline suite of five climates (NoCC plus four CC). The repercussions of climate change on crop yields in Africa are predominantly negative. As an indication of this, Figure 2.5 shows the range of yield impacts on rainfed systems across the baseline climate change scenarios for the five ReSAKSS-Africa regions.

North Africa will see the broadest range of impacts with potentially positive yield changes for roots and tubers or the extreme negative impact on rainfed oilseed production. West, central, and southern Africa see consistently negative yield impacts across all crops, while eastern Africa has the potential to see some positive yield impacts in roots and tubers and, in

⁵ The four climate scenarios follow the Representative Concentration Pathway (RCP) 8.5 in four general circulation models (GCMs) that are used as a common basis for representing climate change in global analyses. GCMs used are the HadGEM2-ES, IPSL-CM5A-LR, MIROC-ESM-CHEM, and GFDL-ESM2M; all are described in Andrews et al. (2012).

particular, pulses. Cereals are projected to see the most consistent decline in yields across Africa (approximately –5 to –20 percent compared with NoCC in 2050). Oilseeds and fruits and vegetables are also consistently negatively impacted across Africa, but the ranges of effects depend on the region. Except for East Africa, pulses will see up to a –10 percent decline in rainfed yields by 2050 compared with a world without climate change. The types of impacts

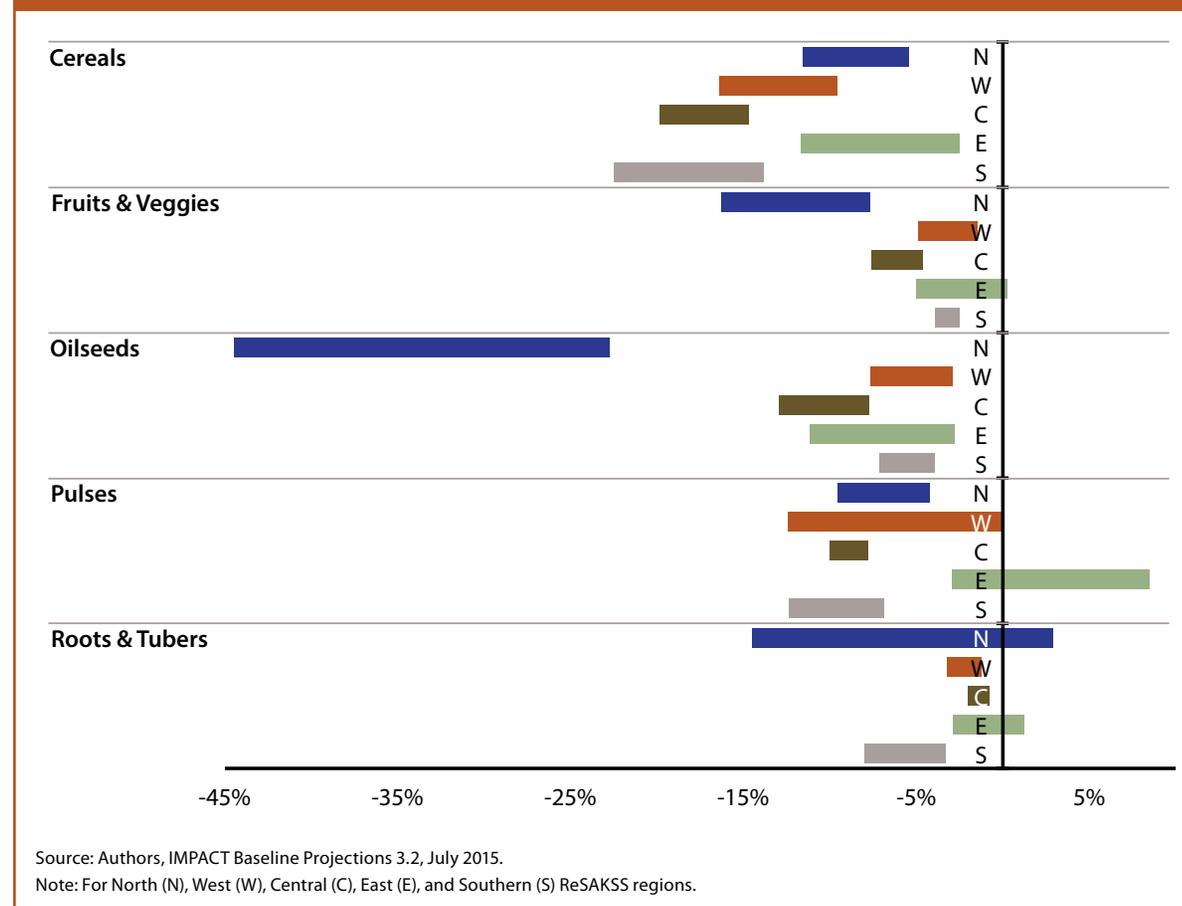
on irrigated systems is similar but strongly depends on whether the source of irrigation water is surface or pumped groundwater. Surface water is more immediately affected, while groundwater will experience more lagged effects.

Water stress is also affected by climate change and has important implications for crop yields. As the different climate models show varied patterns of changes in precipitation (Rosegrant et al. 2014), the effects on

crop productivity are quite mixed for crops across the African landscape depending on location-specific details. Rainfed agriculture, being more dominant than irrigated production in Africa, shows a more widespread and dramatic effect of water stress due to the inability to smooth out water consumption as is possible in irrigated systems. In a few selected irrigated production systems, however, water stress will be so great that production will be severely curtailed unless there is a significant adjustment to production practices (for example, irrigated cereals in Morocco).

A limitation of this modeling framework is that changes in production areas due to climate change are relatively imperfect due to the coarse scale at which the model operates. This could be especially important for the regions in Africa where agricultural production relies on marginal lands, such as in and near the Sahel. While the IMPACT model is especially detailed at a high-resolution geography compared with other global modeling efforts, capturing the dynamics of land use change is currently

FIGURE 2.5—RANGE OF CLIMATE CHANGE IMPACTS ON AGGREGATE COMMODITY YIELDS FOR RESAKSS REGIONS



a topic of research and development in IMPACT. Also, climate effects on livestock production are currently modeled only via secondary effects in feed markets. In the majority of livestock-producing regions, where either or both the livestock and required productive inputs are fairly mobile, this is a workable representation. In Africa, this could be a strong limitation where livestock production activities are often isolated from alternative sources of feed, fodder, and other requirements. As it is with land use, IMPACT's livestock module is currently undergoing revision to include a much more precise representation of livestock production and its diversity across landscapes.

Outlook to 2030 and 2050

Combining the extensive set of modules for the IMPACT model and running them forward produces a set of projections for plausible outcomes for global and African agriculture supply and demand (along with associated food security metrics) out to 2030 and 2050. This establishes a strong foundation for strategic foresight analysis that can inform the policymaking process and help push regions further along the path of human development.

Production

Cereal production in Africa will continue to grow strongly at about 2 percent annually until 2030 but will then slow to just over 1 percent per year in the last half of the projection period to 2050 (Table 2.4). This is important fundamental growth for both East and West Africa, where most of cereals are produced, even if Africa's share of global production remains at less than 10 percent. Climate impacts on cereals will reduce total production by between 6 and 12 percent by 2050 in the ReSAKSS-Africa regions except in East Africa, which could see a slight increase. In the global balance, Africa's share of total production will remain effectively the same under climate change, given that

temperate regions will see more beneficial environments for cereal production while tropical zones suffer.

Africa currently produces one-tenth of global fruit and vegetable produce and will increase their share by more than 5 percentage points by 2050 (Table 2.5). This is quite an important subsector for Africa's own consumption and export earnings. This includes bananas and plantains in West and East Africa along with produce for export from North Africa. Growth is quite strong over the first half of the projection period (more than 3 percent annually) and remains relatively strong from 2030 to 2050. Climate change impacts, in terms of how much total African production is reduced, are projected to be a little less than half of impacts on cereals.

West Africa produces most of the oilseeds in the region and is actually looking at a future of slightly increased production due to climate change (Table 2.6), while Africa remains a relatively minor player in the global oilseed markets (less than 10 percent of global production). At the same time, West Africa is also the leading African producer of pulses and roots and tubers (Tables 2.7 and 2.8). In these two aggregate commodities, Africa is a much more important global player. It produces about 20 percent and 30 percent of total global production for pulses and roots and tubers, respectively, though most of the production is consumed in Africa and is not exported. Africa will also increase its shares of global production to almost 25 percent for pulses and more than 40 percent for roots and tubers. Climate change will hardly affect pulse production in Africa (less than a 1 percent decline) but could impede production of roots and tubers a bit more (more than 2 percent decline). For reasons outlined above, climate effects are rather muted in Africa's livestock sector (Table 2.9). Africa currently produces 5 percent of meat consumed globally and should increase that share to nearly 10 percent by 2050, which is due to relatively slower growth in meat demand outside of Africa.

**TABLE 2.4—BASELINE PRODUCTION OF AGGREGATE CEREALS (million metric tonnes)
IN NOCC SCENARIO AND AVERAGE IMPACT (%) OF CLIMATE CHANGE**

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	580.6	691.4	753.9	-3.0%	-6.1%
South Asia	279.0	385.7	460.3	-10.4%	-18.5%
Middle East & North Africa	114.5	152.6	174.1	0.3%	2.7%
SSA	114.2	178.4	237.1	-2.9%	-5.1%
Latin America & Caribbean	164.4	245.2	323.8	-5.3%	-10.0%
Former Soviet Union	157.2	206.3	243.1	7.1%	14.1%
Europe	310.9	319.1	333.7	1.2%	6.0%
North America	436.3	573.1	711.7	-6.1%	-11.2%
World	2157.0	2751.8	3237.8	-3.4%	-6.1%
ReSAKSS-North	36.5	45.7	49.9	-4.8%	-9.4%
ReSAKSS-West	49.0	78.3	108.3	-2.5%	-6.0%
ReSAKSS-Central	6.4	11.2	15.8	-5.9%	-11.1%
ReSAKSS-East	38.1	56.9	74.4	-0.6%	0.8%
ReSAKSS-Southern	20.6	32.0	38.6	-6.7%	-11.7%
AMU	16.6	21.7	22.6	-9.3%	-20.3%
CENSAD	93.9	138.3	177.3	-4.0%	-8.2%
COMESA	59.0	86.2	110.6	-1.3%	-0.2%
EAC	13.5	19.5	21.1	1.3%	1.3%
ECCAS	7.6	12.9	18.2	-4.3%	-9.0%
ECOWAS	49.0	78.3	108.3	-2.5%	-6.0%
IGAD	28.2	42.4	56.4	-1.7%	-0.3%
SADC	31.9	48.8	59.7	-4.0%	-6.8%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.5—BASELINE PRODUCTION OF AGGREGATE FRUITS AND VEGETABLES (million metric tonnes) IN NOCC SCENARIO AND AVERAGE IMPACT (%) OF CLIMATE CHANGE

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	707.6	920.9	1058.8	1.4%	3.0%
South Asia	156.2	309.7	440.0	-8.0%	-15.2%
Middle East & North Africa	147.2	260.0	362.4	0.8%	1.1%
SSA	101.4	187.4	293.7	-0.3%	-0.1%
Latin America & Caribbean	164.1	235.1	294.7	-2.7%	-4.7%
Former Soviet Union	62.0	80.4	91.9	5.9%	11.1%
Europe	155.9	204.2	244.8	-3.0%	-5.9%
North America	90.9	112.6	139.7	-0.8%	-0.9%
World	1585.4	2310.2	2926.2	-0.8%	-1.7%
ReSAKSS-North	52.7	110.1	161.2	-3.4%	-6.4%
ReSAKSS-West	40.1	73.9	116.5	-2.0%	-3.9%
ReSAKSS-Central	11.1	20.2	30.8	-2.0%	-4.1%
ReSAKSS-East	36.3	70.1	113.8	2.9%	6.1%
ReSAKSS-Southern	13.7	23.0	32.5	-3.2%	-4.7%
AMU	22.1	41.2	65.6	-8.8%	-14.3%
CENSAD	96.7	192.4	291.4	-1.6%	-2.6%
COMESA	69.8	145.4	220.5	1.0%	2.1%
EAC	28.9	56.9	96.3	3.5%	7.0%
ECCAS	15.5	28.4	43.1	-1.0%	-2.2%
ECOWAS	40.1	73.9	116.5	-2.0%	-3.9%
IGAD	25.6	52.2	89.6	3.9%	7.3%
SADC	23.1	38.5	53.5	-2.5%	-3.6%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara

TABLE 2.6—BASELINE PRODUCTION OF AGGREGATE OILSEEDS (million metric tonnes) IN NOCC SCENARIO AND AVERAGE IMPACT (%) OF CLIMATE CHANGE

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	280.6	487.6	667.2	-0.9%	-1.6%
South Asia	41.0	52.3	56.8	-3.9%	-8.7%
Middle East & North Africa	8.5	11.6	13.7	-2.8%	-5.0%
SSA	52.9	90.0	113.9	0.3%	1.0%
Latin America & Caribbean	125.6	183.2	214.8	-1.0%	-1.6%
Former Soviet Union	14.5	18.7	22.2	4.1%	7.7%
Europe	40.3	53.3	60.4	-1.0%	-2.7%
North America	109.6	138.9	154.7	-1.6%	-4.2%
World	673.1	1035.6	1303.6	-1.0%	-1.9%
ReSAKSS-North	3.1	4.3	5.2	-8.0%	-14.2%
ReSAKSS-West	42.7	74.8	95.0	0.6%	1.6%
ReSAKSS-Central	3.5	5.8	7.5	-1.5%	-4.1%
ReSAKSS-East	4.0	5.8	7.3	-0.9%	0.3%
ReSAKSS-Southern	2.6	3.6	4.1	-1.2%	-2.2%
AMU	2.3	3.1	3.8	-10.8%	-18.2%
CENSAD	47.6	81.8	103.5	0.1%	0.6%
COMESA	4.8	7.1	8.8	-2.2%	-3.6%
EAC	2.2	3.1	4.0	0.6%	3.4%
ECCAS	3.9	6.5	8.1	-1.2%	-3.5%
ECOWAS	42.7	74.8	95.0	0.6%	1.6%
IGAD	2.6	3.8	4.4	-0.8%	0.7%
SADC	4.4	6.5	8.4	-1.8%	-3.0%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.7—BASELINE PRODUCTION OF AGGREGATE PULSES (million metric tonnes) IN NOCC SCENARIO AND AVERAGE IMPACT (%) OF CLIMATE CHANGE

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	12.7	16.3	19.7	-1.4%	-1.9%
South Asia	15.6	20.7	24.1	-2.8%	-6.0%
Middle East & North Africa	4.0	5.8	7.2	-5.8%	-10.6%
SSA	11.6	18.2	27.5	0.0%	0.0%
Latin America & Caribbean	6.9	11.1	16.0	-6.9%	-12.0%
Former Soviet Union	3.3	4.2	5.2	2.9%	6.0%
Europe	5.2	7.3	9.1	3.9%	6.2%
North America	6.9	9.7	12.1	3.0%	5.3%
World	66.3	93.3	121.1	-1.3%	-2.5%
ReSAKSS-North	1.0	1.4	1.9	-7.7%	-11.8%
ReSAKSS-West	5.3	9.3	15.3	-1.8%	-3.3%
ReSAKSS-Central	1.1	1.7	2.5	-3.0%	-6.3%
ReSAKSS-East	4.4	5.9	7.7	5.9%	12.7%
ReSAKSS-Southern	0.8	1.3	2.0	-9.6%	-16.1%
AMU	0.6	0.8	1.1	-4.3%	-7.0%
CENSAD	7.2	12.3	19.3	-1.0%	-1.1%
COMESA	4.6	6.4	8.6	4.3%	9.2%
EAC	2.8	4.1	5.3	3.5%	8.3%
ECCAS	1.5	2.2	3.2	0.0%	-2.3%
ECOWAS	5.3	9.3	15.3	-1.8%	-3.3%
IGAD	2.9	3.8	5.0	10.7%	23.3%
SADC	2.2	3.4	4.8	-7.9%	-14.0%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.8—BASELINE PRODUCTION OF AGGREGATE ROOTS AND TUBERS (million metric tonnes) IN NOCC SCENARIO AND AVERAGE IMPACT (%) OF CLIMATE CHANGE

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	248.1	273.9	257.7	0.8%	1.7%
South Asia	50.3	75.1	103.4	-0.5%	-1.0%
Middle East & North Africa	21.2	28.1	34.1	-6.7%	-12.0%
SSA	224.0	346.6	483.2	-1.0%	-1.7%
Latin America & Caribbean	59.9	83.4	98.5	0.5%	1.8%
Former Soviet Union	82.3	88.2	82.9	1.8%	0.4%
Europe	67.9	77.2	82.6	-21.5%	-37.2%
North America	26.2	29.6	33.0	3.5%	6.6%
World	779.8	1002.1	1175.4	-1.7%	-3.0%
ReSAKSS-North	8.4	12.7	15.9	-10.9%	-17.8%
ReSAKSS-West	133.2	206.0	293.9	-0.6%	-1.0%
ReSAKSS-Central	26.8	45.6	65.3	-1.4%	-2.4%
ReSAKSS-East	34.5	56.6	81.2	-1.0%	-1.4%
ReSAKSS-Southern	29.5	38.3	42.7	-2.9%	-5.3%
AMU	5.0	6.9	7.8	-3.7%	-2.2%
CENSAD	144.3	224.4	318.9	-1.1%	-1.7%
COMESA	54.8	88.3	120.6	-2.9%	-4.9%
EAC	25.2	42.3	61.4	-0.9%	-1.3%
ECCAS	42.2	66.9	89.7	-1.6%	-2.9%
ECOWAS	133.2	206.0	293.9	-0.6%	-1.0%
IGAD	19.3	32.1	44.8	-0.9%	-1.8%
SADC	57.8	85.0	111.4	-2.1%	-3.2%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.9—BASELINE PRODUCTION OF AGGREGATE MEAT (million metric tonnes) IN NOCC SCENARIO AND AVERAGE IMPACT (%) OF CLIMATE CHANGE

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	99.0	130.4	135.3	-0.6%	-1.0%
South Asia	9.9	19.1	30.7	0.1%	0.0%
Middle East & North Africa	10.8	19.5	31.2	-0.3%	-0.7%
SSA	10.8	20.4	34.4	-0.1%	-0.1%
Latin America & Caribbean	44.0	66.4	84.3	-0.3%	-0.6%
Former Soviet Union	10.0	12.4	13.5	0.2%	-0.1%
Europe	44.2	51.8	55.8	0.1%	-0.2%
North America	45.2	60.7	72.9	-0.3%	-1.0%
World	274.0	380.7	458.0	-0.3%	-0.6%
ReSAKSS-North	3.5	6.5	10.7	-0.2%	-0.5%
ReSAKSS-West	2.8	5.6	10.4	-0.2%	-0.3%
ReSAKSS-Central	0.7	1.3	2.3	-0.1%	0.0%
ReSAKSS-East	4.2	8.1	14.4	0.0%	0.2%
ReSAKSS-Southern	3.2	5.4	7.4	0.0%	-0.3%
AMU	1.9	3.4	5.1	-0.2%	-0.7%
CENSAD	8.2	16.1	28.8	-0.1%	-0.2%
COMESA	5.9	11.3	19.8	0.0%	0.0%
EAC	1.5	2.7	4.2	0.0%	0.2%
ECCAS	0.9	1.6	2.6	0.0%	0.1%
ECOWAS	2.8	5.6	10.4	-0.2%	-0.3%
IGAD	3.4	6.6	11.8	0.0%	0.2%
SADC	4.0	7.0	10.3	0.0%	-0.2%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

Demand

Total demand for commodities in Africa is increasing significantly over the coming decades (Figure 2.6), in line with increasing per capita incomes and population. Demand for cereals, oilseeds, and roots and tubers will more than double by 2050, while total consumption of pulses and fruits and vegetables will be in the range of tripling. Meat demand in Africa, starting from a relatively low base in 2010, will nearly quadruple by 2050. This has important implications for nutrition and food security, which are detailed below.

Looking more closely at per capita food consumption broken out on a regional basis for these aggregate commodities shows a picture of how tastes and preferences both differ and are shifting across Africa (Figure 2.7). Consumption of staples is seeing differentiated preferences across Africa, while nonstaples are consistently experiencing increasing per capita demands. Cereal consumption is declining in the North and apparently leveling off at about 150 kilograms per capita per year in western and southern Africa. In the Central and East ReSAKSS regions, where per capita levels are lower, preferences are still to continue increasing consumption. The other source of major staples, root and tubers, is seeing declining consumption in the regions where per capita demands have been higher in the past (western and central Africa) and on the rise in regions where it may be representing a diversification of dietary habits (northern, eastern, and southern). Fruits and vegetables, oilseeds, pulses, and meat are all strongly increasing at the per capita level, which is a phenomenon common across many other regions as they develop and experience increasing per capita incomes.

FIGURE 2.6—INDEXED TOTAL DEMAND TRAJECTORIES FOR AFRICA (BSLN-CC)

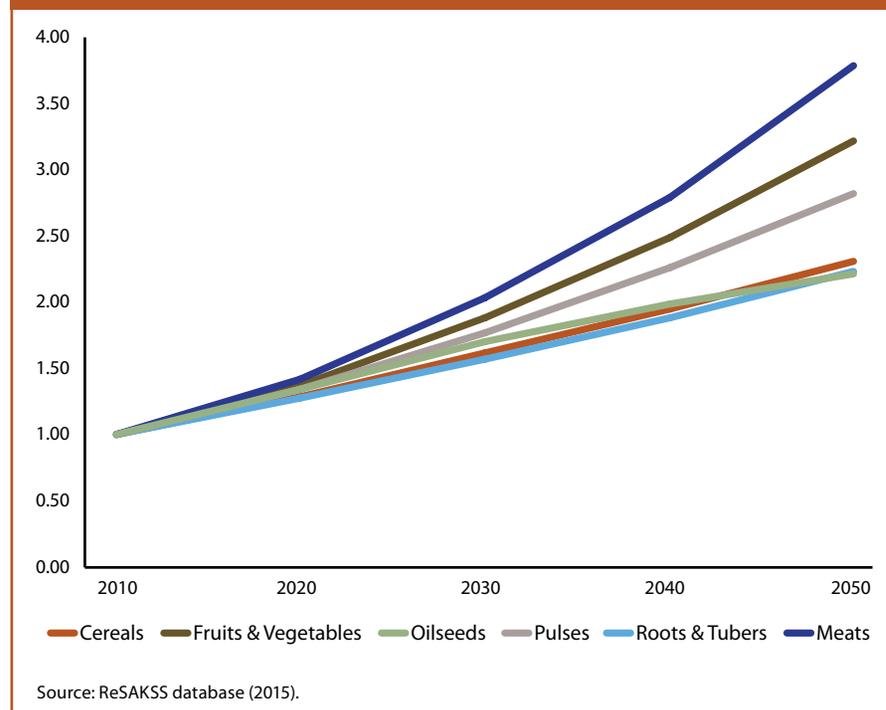
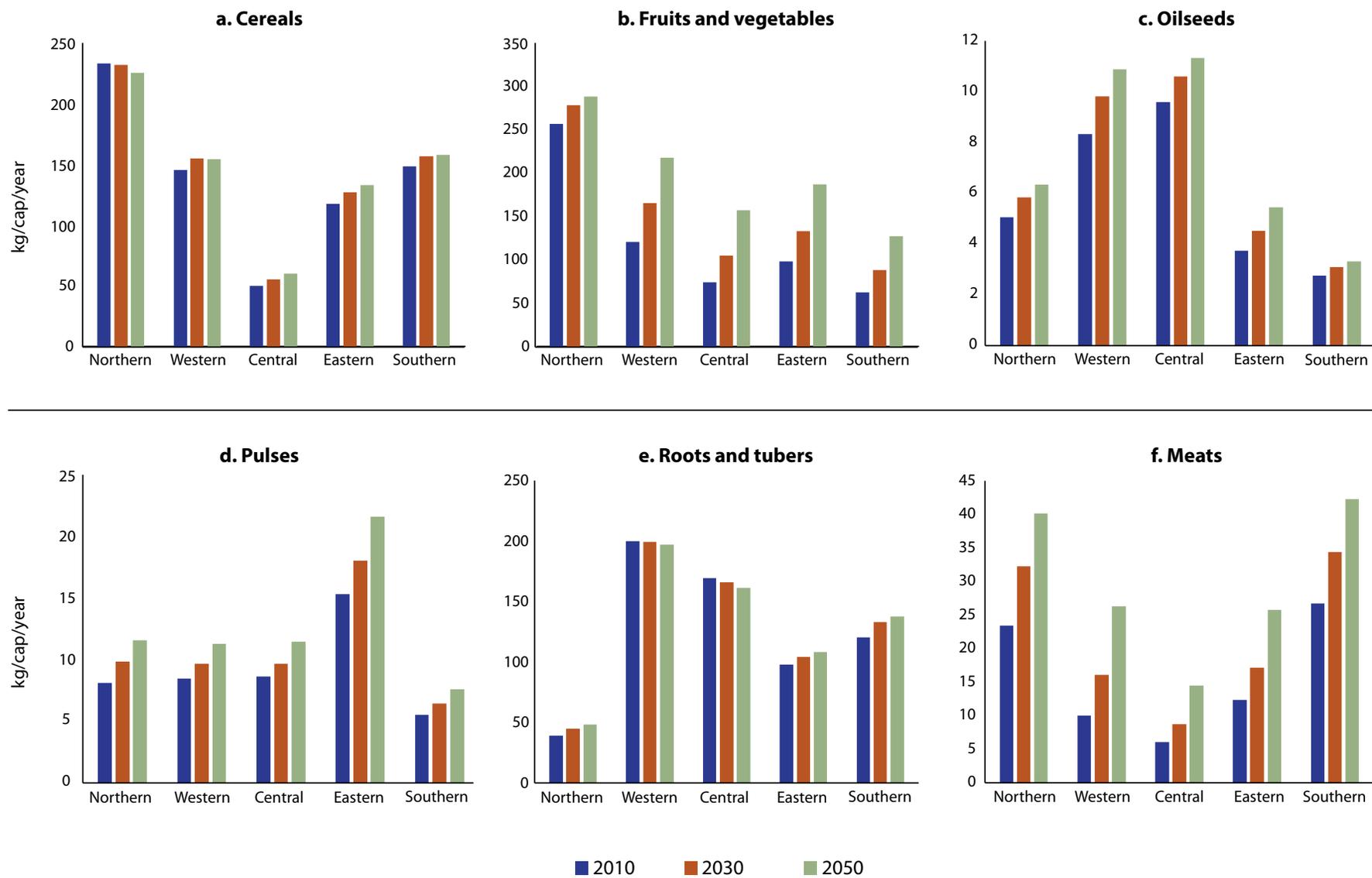


FIGURE 2.7—BSLN-CC PER CAPITA CONSUMPTION, RESAKSS REGIONS



Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Net Trade

In general, the expansion of productive capacity in the baseline suite of scenarios is not adequate to expand national supplies enough to meet increasing demands, which then must be met through net imports. This is especially the case for cereals (Table 2.10). Africa is already a major global importer of cereals and is projected to be a net importer of half of all available net exports from the world by 2050. In a limited number of cases, Africa's comparative advantage leads to consistent net export positions, such as fruits and vegetables from North Africa (for example, Egypt and Morocco) (Table 2.11).

Trade markets in oilseeds and pulses are thin from the Africa perspective (Tables 2.12 and 2.13). Though these two commodities may be locally important to particular sectors or regions, they are effectively nonexistent from the global point of view. Roots and tubers trade is spread more evenly

across Africa by 2050 in the BSLN-CC set, with the exception of North Africa (Table 2.14). Each region is a net importer in the range of 6 to 9 million metric tonnes by 2050.

These aggregate net trade numbers can mask an extraordinary amount of trade that occurs at the local and subregional levels, which will often not be concerned with national boundaries. Meat trade at the aggregate level in Africa (Table 2.15) is about 12.5 million metric tonnes of imports in 2050, whereas the total amount of net imports summed across each country of Africa is 75 million metric tonnes.

Climate change impact ripples through to net trade with only relatively weak effects in Africa. Mostly, the net trade picture for the commodities presented here changes little in the BSLN-CC scenarios compared with NoCC. The one minor exception to this is roots and tubers in North Africa, but these differences are only slight.

TABLE 2.10—BASELINE NET TRADE OF AGGREGATE CEREALS (million metric tonnes) IN NOCC SCENARIO AND AVERAGE OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (million metric tonnes)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	-29.3	-50.2	-55.7	-27.4	4.3
South Asia	-3.1	-1.4	-39.0	-36.4	-103.9
Middle East & North Africa	-48.4	-78.8	-121.9	-77.2	-111.1
SSA	-28.3	-75.5	-155.8	-71.1	-139.6
Latin America & Caribbean	-22.2	-16.6	-2.5	-21.7	-54.2
Former Soviet Union	23.9	64.4	103.8	80.9	141.9
Europe	20.7	-13.3	-13.3	-11.1	2.8
North America	128.4	213.2	326.2	205.8	301.6
World	41.8	41.8	41.8	41.8	41.8
ReSAKSS-North	-24.8	-40.5	-61.6	-41.1	-60.1
ReSAKSS-West	-11.3	-32.3	-67.8	-30.2	-62.0
ReSAKSS-Central	-1.3	-4.0	-11.1	-4.0	-10.5
ReSAKSS-East	-7.2	-23.2	-48.2	-21.3	-40.4
ReSAKSS-Southern	-8.3	-15.8	-28.5	-15.4	-26.5
AMU	-13.6	-17.8	-23.4	-19.7	-27.3
CENSAD	-32.5	-70.8	-133.6	-70.0	-127.5
COMESA	-22.3	-48.8	-92.2	-45.8	-78.6
EAC	-3.6	-13.3	-32.5	-11.6	-27.3
ECCAS	-3.1	-8.0	-17.4	-8.0	-16.4
ECOWAS	-11.3	-32.3	-67.8	-30.2	-62.0
IGAD	-6.0	-17.0	-33.7	-16.5	-29.8
SADC	-9.5	-23.0	-46.6	-21.0	-40.0

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.11—BASELINE NET TRADE OF AGGREGATE FRUITS AND VEGETABLES (million metric tonnes) IN NOCC SCENARIO AND AVERAGE OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (million metric tonnes)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	-19.1	-41.9	112.1	-20.8	159.3
South Asia	-26.9	-88.6	-284.9	-108.5	-336.5
Middle East & North Africa	7.4	67.5	131.1	69.1	135.8
SSA	-3.1	-35.6	-126.6	-34.2	-120.2
Latin America & Caribbean	46.0	74.8	103.2	70.2	93.5
Former Soviet Union	1.0	4.5	9.2	9.7	21.6
Europe	-6.0	25.3	52.8	20.1	40.9
North America	2.4	-4.5	4.8	-4.1	7.3
World	1.6	1.6	1.6	1.6	1.6
ReSAKSS-North	4.5	44.6	84.1	40.3	73.3
ReSAKSS-West	-0.6	-15.1	-51.8	-15.7	-52.9
ReSAKSS-Central	0.6	-3.0	-15.2	-3.2	-15.6
ReSAKSS-East	-5.4	-18.7	-53.7	-16.3	-45.2
ReSAKSS-Southern	2.2	1.2	-6.0	0.9	-6.5
AMU	1.5	12.9	33.0	9.5	24.2
CENSAD	0.4	18.1	2.3	15.8	-1.7
COMESA	-2.2	12.4	-11.1	13.6	-5.2
EAC	-1.6	-9.1	-27.9	-7.0	-20.6
ECCAS	-0.6	-7.6	-25.9	-7.4	-25.6
ECOWAS	-0.6	-15.1	-51.8	-15.7	-52.9
IGAD	-4.2	-9.5	-23.8	-7.3	-16.7
SADC	1.3	-7.8	-37.0	-8.2	-36.9

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.12—BASELINE NET TRADE OF AGGREGATE OILSEEDS (million metric tonnes) IN NOCC SCENARIO AND AVERAGE OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (million metric tonnes)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	-33.4	-48.5	-50.1	-47.1	-47.2
South Asia	1.1	-3.4	-7.8	-3.9	-8.9
Middle East & North Africa	-5.7	-6.9	-7.9	-6.6	-7.4
SSA	0.5	-1.1	-5.8	-0.9	-4.7
Latin America & Caribbean	27.3	46.5	56.9	44.9	53.3
Former Soviet Union	0.1	1.0	1.9	1.3	2.7
Europe	-15.1	-14.1	-13.6	-13.6	-12.9
North America	36.5	42.3	45.5	41.6	43.9
World	11.3	15.9	19.1	15.8	18.9
ReSAKSS-North	-1.3	-1.4	-1.5	-1.4	-1.5
ReSAKSS-West	0.5	-0.3	-3.4	-0.2	-2.7
ReSAKSS-Central	0.2	0.2	0.1	0.2	0.0
ReSAKSS-East	0.0	-0.6	-2.0	-0.6	-1.7
ReSAKSS-Southern	-0.2	-0.3	-0.5	-0.3	-0.5
AMU	-0.6	-0.6	-0.6	-0.6	-0.6
CENSAD	-0.6	-1.7	-5.3	-1.6	-4.6
COMESA	-0.9	-1.7	-3.0	-1.6	-2.8
EAC	0.0	-0.7	-1.8	-0.5	-1.4
ECCAS	0.2	0.1	0.0	0.1	-0.1
ECOWAS	0.5	-0.3	-3.4	-0.2	-2.7
IGAD	0.0	-0.3	-1.3	-0.3	-1.1
SADC	-0.4	-0.9	-1.5	-0.8	-1.3

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.13—BASELINE NET TRADE OF AGGREGATE PULSES (million metric tonnes) IN NOCC SCENARIO AND AVERAGE OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (million metric tonnes)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	2.5	3.1	5.2	3.2	5.5
South Asia	-3.0	-6.2	-10.3	-6.4	-10.9
Middle East & North Africa	-0.7	-1.2	-1.7	-1.5	-2.4
SSA	-0.9	-4.5	-9.9	-4.2	-9.1
Latin America & Caribbean	-0.6	1.2	4.4	0.5	2.6
Former Soviet Union	0.6	1.5	2.5	1.6	3.0
Europe	-0.8	1.0	2.6	1.4	3.5
North America	4.3	6.6	8.5	6.9	9.2
World	1.5	1.5	1.5	1.5	1.5
ReSAKSS-North	-0.8	-1.2	-1.7	-1.3	-1.9
ReSAKSS-West	0.3	0.1	-0.4	0.1	-0.5
ReSAKSS-Central	0.0	-0.3	-0.6	-0.3	-0.7
ReSAKSS-East	-1.0	-4.0	-8.3	-3.6	-7.1
ReSAKSS-Southern	-0.2	-0.4	-0.6	-0.5	-0.8
AMU	-0.2	-0.2	-0.2	-0.3	-0.2
CENSAD	-0.7	-1.8	-3.4	-1.7	-3.1
COMESA	-1.6	-4.9	-9.4	-4.6	-8.3
EAC	-0.5	-2.0	-4.6	-1.8	-3.9
ECCAS	-0.2	-0.7	-1.4	-0.6	-1.3
ECOWAS	0.3	0.1	-0.4	0.1	-0.5
IGAD	-0.8	-3.1	-6.2	-2.6	-4.8
SADC	-0.3	-1.0	-2.2	-1.2	-2.7

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.14—BASELINE NET TRADE OF AGGREGATE ROOTS AND TUBERS (million metric tonnes) IN NOCC SCENARIO AND AVERAGE OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (million metric tonnes)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	1.2	-1.2	9.0	6.6	21.7
South Asia	-6.3	-23.7	-28.5	-21.1	-23.4
Middle East & North Africa	-0.5	-1.5	-1.2	-2.4	-4.0
SSA	-0.2	-10.9	-29.7	-11.3	-29.2
Latin America & Caribbean	0.2	13.1	23.4	15.4	29.1
Former Soviet Union	9.2	18.4	14.0	21.4	20.0
Europe	-0.5	9.5	16.3	-6.6	-14.0
North America	-0.5	-1.3	-0.8	0.4	2.3
World	2.5	2.5	2.5	2.5	2.5
ReSAKSS-North	0.3	0.7	0.9	-0.3	-1.4
ReSAKSS-West	2.0	-3.7	-11.2	-3.0	-8.7
ReSAKSS-Central	-1.2	-2.2	-7.0	-2.7	-8.5
ReSAKSS-East	-2.7	-5.4	-6.3	-5.3	-5.9
ReSAKSS-Southern	1.7	0.4	-5.1	-0.2	-6.1
AMU	0.1	-0.1	-0.2	-0.2	0.0
CENSAD	1.9	-3.0	-9.7	-3.1	-9.1
COMESA	-3.5	-10.3	-25.4	-11.9	-29.4
EAC	-1.4	-3.6	-5.6	-3.6	-5.3
ECCAS	0.8	1.2	-5.3	0.7	-7.0
ECOWAS	2.0	-3.7	-11.2	-3.0	-8.7
IGAD	-1.2	-2.2	-4.0	-2.2	-4.0
SADC	-0.6	-5.4	-16.7	-6.5	-18.9

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.15—BASELINE NET TRADE OF AGGREGATE MEATS (million metric tonnes) IN NOCC SCENARIO AND AVERAGE OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (million metric tonnes)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	-7.3	-22.8	-23.8	-23.2	-24.3
South Asia	0.3	-2.2	-9.8	-2.1	-9.5
Middle East & North Africa	-1.8	-1.6	1.8	-1.6	1.8
SSA	-0.4	-3.7	-13.9	-3.7	-13.6
Latin America & Caribbean	7.1	16.3	25.2	16.3	25.2
Former Soviet Union	-3.0	-3.3	-3.3	-3.3	-3.2
Europe	1.4	5.8	6.3	6.0	6.5
North America	4.1	12.0	17.9	11.9	17.4
World	0.4	0.4	0.4	0.4	0.4
ReSAKSS-North	-0.5	-0.4	1.0	-0.3	1.1
ReSAKSS-West	-0.3	-2.0	-7.4	-2.0	-7.3
ReSAKSS-Central	0.0	-0.3	-1.2	-0.3	-1.2
ReSAKSS-East	0.5	-0.1	-2.1	-0.1	-2.0
ReSAKSS-Southern	-0.6	-1.4	-3.0	-1.3	-3.0
AMU	-0.2	-0.1	0.7	-0.1	0.7
CENSAD	-0.1	-1.8	-6.5	-1.7	-6.3
COMESA	0.1	-0.6	-2.5	-0.6	-2.4
EAC	0.0	-0.7	-2.8	-0.7	-2.8
ECCAS	-0.4	-1.1	-2.5	-1.1	-2.4
ECOWAS	-0.3	-2.0	-7.4	-2.0	-7.3
IGAD	0.5	0.2	-0.8	0.3	-0.7
SADC	-0.6	-1.7	-4.7	-1.7	-4.6

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

Prices

At the intersection of production, consumption, and trade are global, commodity-level prices that help complete a picture of changing markets and the evolution of the agricultural sector. Indexed global commodity price trajectories for the NoCC and BSLN-CC scenarios are presented in Figure 2.8. The range of impacts found in the basic climate change scenarios described above are shown as gray bands around the BSLN-CC mean.

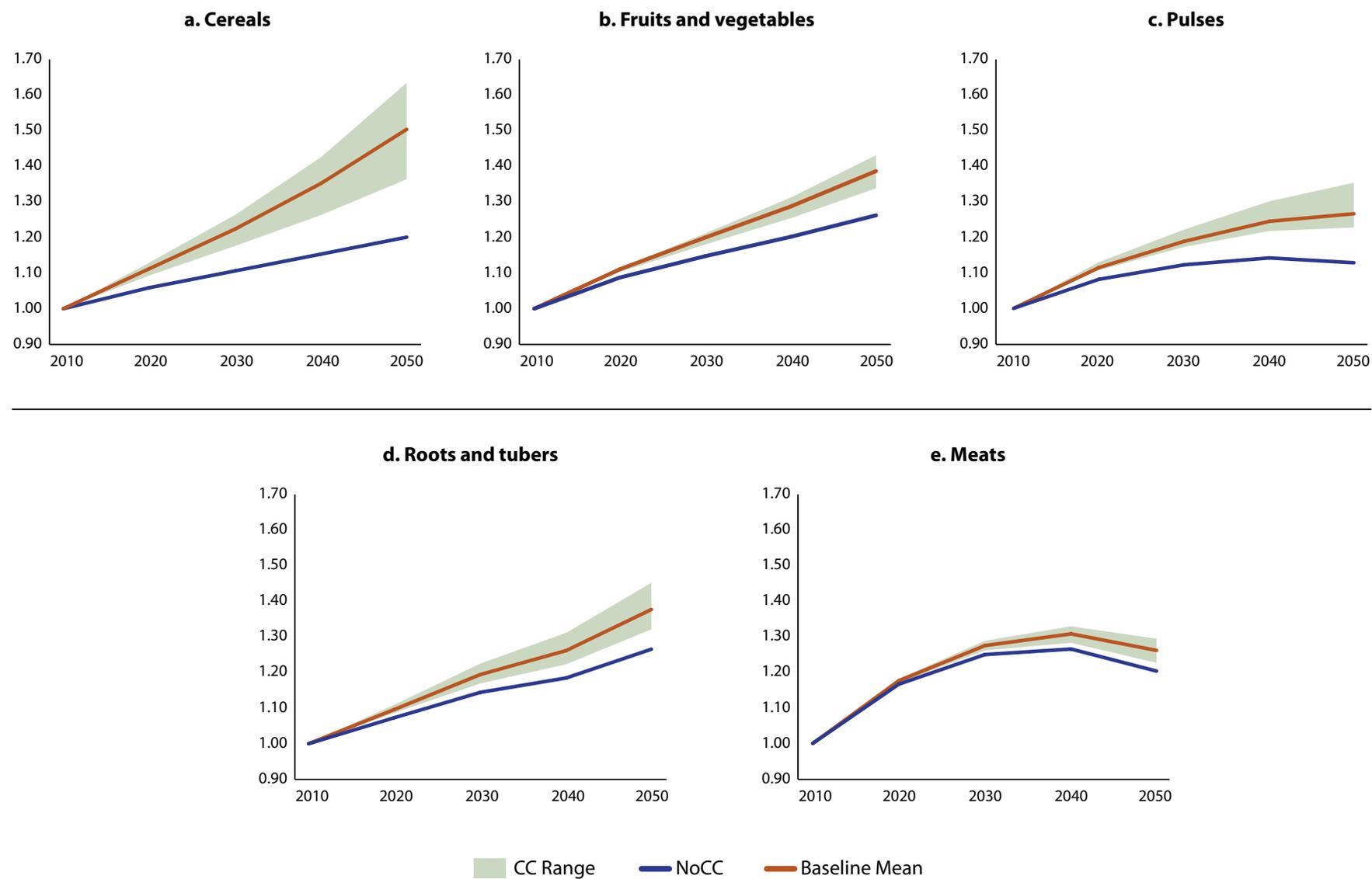
Cereals face the most severe global impacts of climate change on prices in the BSLN-CC compared with the NoCC. Aggregate cereal prices are about 25 percent higher under climate change in 2050 compared with a world without climate impacts. This is a price level 50 percent higher than 2010 levels. Fruits and vegetables, pulses, and roots and tubers see a 9–12 percent increase in global commodity-level prices compared with no climate change, which are about 26–38 percent higher than their 2010 prices. Meat markets see only a relatively modest impact of climate change on aggregate commodity-level prices (5 percent).

The importance of these price changes for Africa will greatly depend on the level of integration with world markets. Price increases certainly represent an opportunity for producers who can manage to supply global markets, but could be a severe challenge for net consumers of these commodities. Currently, much of Africa is relatively isolated from these global commodity markets, but this will change as incomes increase and markets become more integrated.

Food Security

Indicators of food security key off of the per capita calorie availability implied by the trajectories of food availability at the country level. Other assumptions also come into play, as detailed in the IMPACT model documentation. The two metrics used here in addition to per capita calories are the number of malnourished children (ages 0 to 5, by weight) and the share of the general population at risk of hunger.

FIGURE 2.8—NOCC AND BSLN-CC RANGE OF INDEXED WORLD PRICES TRAJECTORIES



Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Table 2.16 shows consistent increasing calorie availability in the NoCC baseline and a clear negative impact of climate change across the globe (decreased yields, leading to increased prices and in turn decreased availability of food for consumption). Central Africa is projected to make marked improvements in the baseline calorie consumption, which is critical given the low starting point in 2010 just at 2,000 kcal per capita. North Africa is already consuming nearly at the same level of the developed world and therefore sees little increase in calories. Other parts of Africa see about a 12 percent increase in calories by 2030 and a 25 percent increase by 2050 compared with 2010. While the impact of climate change on calorie consumption in Africa (and elsewhere in the world) seems relatively modest at 1–2 percent and 2–3 percent reductions by 2030 and 2050, respectively, this has crucial repercussions on the hungry and undernourished.

While Africa as a whole is managing to reduce the number of undernourished children (ages 0 to 5, by weight) by 8 million in 2050 compared with 2010 in the NoCC scenario, a few regions, such as West Africa, are struggling to make advances (Table 2.17). This is largely an issue of fast population growth, but also of other stagnating conditions that constrain the potential for progress. The improvements across Africa seem to take hold only in the latter half of the projection period, which is a sign of persistent

challenges that Africa faces in advancing human development. Climate change makes this problem worse by keeping 2 million more children malnourished.

The picture for hunger in the general population shows a more optimistic future in Africa (Table 2.18). The share at risk of hunger in North Africa is already at the minimum estimate (about 4 percent), while the rest of Africa shows a strong improvement by cutting the shares approximately in half by 2030 in Africa south of the Sahara, with the Central ReSAKSS region leading the way. In the NoCC scenario, all of Africa is at the lower threshold of this metric, between 4 and 6 percent by the end of the projection period, though eastern and southern Africa lag behind slightly.

Climate change impacts in the agriculture sector keep an important percentage of the population at risk of hunger. North Africa's ability to maintain access to calories means that their exposure to this risk increases only little, on par with developed regions in North America and Europe. West Africa sees a moderate increase in the share at risk of hunger, but roughly the same as other middle-income economies around the globe at 0.4 to 0.6 percentage points. The rest of Africa (central, eastern, and southern) sees relatively stronger impacts of climate change on hunger, between 1 and 2 percentage points above the NoCC projections.

TABLE 2.16—BASELINE PER CAPITA KILOCALORIE AVAILABILITY (KCAL/capita/day) IN NOCC SCENARIO AND AVERAGE IMPACT OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (%)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	2,881	3,309	3,435	-1.2%	-2.7%
South Asia	2,354	2,624	2,846	-1.3%	-2.9%
Middle East & North Africa	3,145	3,256	3,372	-0.8%	-2.1%
SSA	2,380	2,710	3,079	-1.9%	-3.5%
Latin America & Caribbean	2,882	3,040	3,185	-1.3%	-2.5%
Former Soviet Union	3,094	3,326	3,429	-0.5%	-1.5%
Europe	3,436	3,485	3,573	-0.5%	-1.3%
North America	3,717	3,732	3,743	-0.6%	-1.5%
World	2,805	3,049	3,212	-1.2%	-2.6%
ReSAKSS-North	3,261	3,468	3,655	-1.0%	-2.4%
ReSAKSS-West	2,664	2,986	3,265	-2.0%	-3.5%
ReSAKSS-Central	2,042	2,554	3,293	-1.6%	-2.7%
ReSAKSS-East	2,178	2,467	2,825	-1.8%	-3.3%
ReSAKSS-Southern	2,492	2,775	3,020	-2.5%	-4.6%
AMU	3,133	3,349	3,507	-0.7%	-1.9%
CENSAD	2,711	2,975	3,258	-1.7%	-3.3%
COMESA	2,376	2,678	3,104	-1.7%	-3.2%
EAC	2,215	2,589	2,992	-2.4%	-4.2%
ECCAS	2,101	2,583	3,210	-1.6%	-2.9%
ECOWAS	2,664	2,986	3,265	-2.0%	-3.5%
IGAD	2,193	2,469	2,825	-1.5%	-2.8%
SADC	2,278	2,635	3,073	-2.3%	-4.0%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.17—BASELINE NUMBER OF UNDERNOURISHED CHILDREN (millions, ages 0–5, by weight) IN NOCC SCENARIO AND AVERAGE IMPACT OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (%)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	21.8	11.3	7.8	3.4%	4.6%
South Asia	77.3	64.6	52.0	0.8%	2.1%
Middle East & North Africa	4.0	2.7	1.9	3.0%	6.4%
SSA	40.6	41.1	33.5	2.0%	4.9%
Latin America & Caribbean	4.3	2.8	1.5	5.6%	16.0%
Former Soviet Union	1.4	1.1	1.3	1.7%	4.4%
Europe	0.4	0.2	0.2	0.8%	1.8%
North America	—	—	—	—	—
World	149.8	124.0	98.2	1.6%	3.6%
ReSAKSS-North	1.0	0.4	0.2	10.2%	19.9%
ReSAKSS-West	14.5	15.8	15.1	2.0%	4.5%
ReSAKSS-Central	5.6	5.1	3.1	1.8%	5.2%
ReSAKSS-East	16.0	16.0	12.6	1.7%	4.1%
ReSAKSS-Southern	4.4	4.2	2.7	3.8%	10.7%
AMU	0.7	0.3	0.2	3.6%	19.0%
CENSAD	21.2	21.4	18.9	2.2%	4.7%
COMESA	19.3	18.6	13.4	2.0%	4.8%
EAC	5.8	5.3	4.0	3.4%	8.8%
ECCAS	6.9	6.4	4.2	1.9%	5.3%
ECOWAS	14.5	15.8	15.1	2.1%	4.5%
IGAD	12.2	12.1	9.4	1.4%	3.3%
SADC	11.4	11.0	7.5	2.8%	7.5%

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

TABLE 2.18—BASELINE SHARE OF POPULATION AT RISK OF HUNGER (%) IN NOCC SCENARIO AND AVERAGE CHANGE OF FOUR BASELINE CLIMATE CHANGE SCENARIOS (percentage points)

	NoCC			Climate Change	
	2010	2030	2050	2030	2050
East Asia & Pacific	12.7	5.3	4.5	0.38	0.68
South Asia	18.4	8.6	4.9	1.02	0.57
Middle East & North Africa	7.7	7.7	7.2	0.14	0.42
SSA	23.2	11.8	6.8	1.22	1.19
Latin America & Caribbean	9.0	6.4	4.6	0.51	0.69
Former Soviet Union	6.4	4.0	3.4	0.08	0.08
Europe	4.7	4.3	3.8	0.08	0.39
North America	3.2	3.2	3.0	0.01	0.16
World	13.4	7.2	5.1	0.62	0.67
ReSAKSS-North	4.0	3.5	3.4	0.05	0.08
ReSAKSS-West	12.0	6.0	4.3	0.49	0.59
ReSAKSS-Central	34.7	9.8	4.5	1.35	0.65
ReSAKSS-East	29.8	17.6	9.4	1.62	1.63
ReSAKSS-Southern	23.8	13.8	9.0	1.93	2.22
AMU	5.0	4.1	3.9	0.09	0.16
CENSAD	13.5	7.9	4.8	0.65	0.69
COMESA	26.5	13.2	6.9	1.41	1.11
EAC	30.6	15.2	8.3	2.02	1.49
ECCAS	33.0	10.6	5.7	1.32	0.94
ECOWAS	12.0	6.0	4.3	0.49	0.59
IGAD	27.0	15.7	8.1	1.25	1.04
SADC	30.3	14.4	8.9	1.98	2.04

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Note: Small island nations not included (for example, Cape Verde, Comoros, Mauritius, Seychelles, São Tomé and Príncipe); AMU = Arab Maghreb Union, CENSAD = Community of Sahel-Saharan States, COMESA = Common Market for Eastern and Southern Africa, EAC = East African Community, ECCAS = Economic Community of Central African States, ECOWAS = Economic Community of West African States, IGAD = Intergovernmental Authority on Development, SADC = Southern African Development Community, SSA = Africa south of the Sahara.

A Possible Alternative Outcome

The baseline presented here shows that the basic underlying trends and drivers of agriculture and the economy in general in Africa are largely positive and represent an important innate capacity for advancement across the continent. The outcomes of climate change scenarios, however, indicate vulnerabilities that need to be addressed. Fortunately, several pathways are feasible for directing Africa away from these roadblocks and for realizing a fuller potential. The CAADP pillars are key guideposts that help greatly in this regard, but other important complementary developments in education, infrastructure, healthcare, and government services, among others, will lead Africa to a stronger and healthier middle-income status (see, for example, topics covered in the following chapters).

A quick scenario analysis of an alternative future with accelerated growth in GDP gives an indication of Africa's potential. In IMPACT we use multipliers on national incomes to achieve middle-income status for nearly all nations by 2030 (with only Zimbabwe and Eritrea lagging, but they would achieve middle-income status if accelerated GDP growth would continue past 2030). In this scenario, countries currently still low income by 2030 in SSP2 see a 50 percent increase in the growth rate of national GDP; countries of low-middle income by 2030 see a 10 percent increase in their GDP growth rate; and countries of upper-middle income see a 5 percent increase in GDP growth rate. Achievement of this level of accelerated GDP growth would be challenging but is within the realm of possibility with focused and targeted investments in the lesser-developed regions of Africa. Agriculture sector growth could partially meet this development, but it would have to rely on a combination of several sectors performing well.

The impacts of such a scenario show increases in consumption in line with expanding household incomes. This augmented consumption in the absence of other sector developments is met mostly through increased imports (Table 2.19), which may or may not be in the national interests of different countries. More importantly, this alternative scenario more than compensates for the impacts of climate change compared with a scenario without climate effects—except in North Africa where the scenario posited only a slight increase in income. Per capita calorie availability increases beyond the levels found in the NoCC environment, while the number of malnourished children in Africa is reduced by 3.3 million when compared with BSLN-CC. The share at risk of hunger is also reduced below the levels of the NoCC scenario.

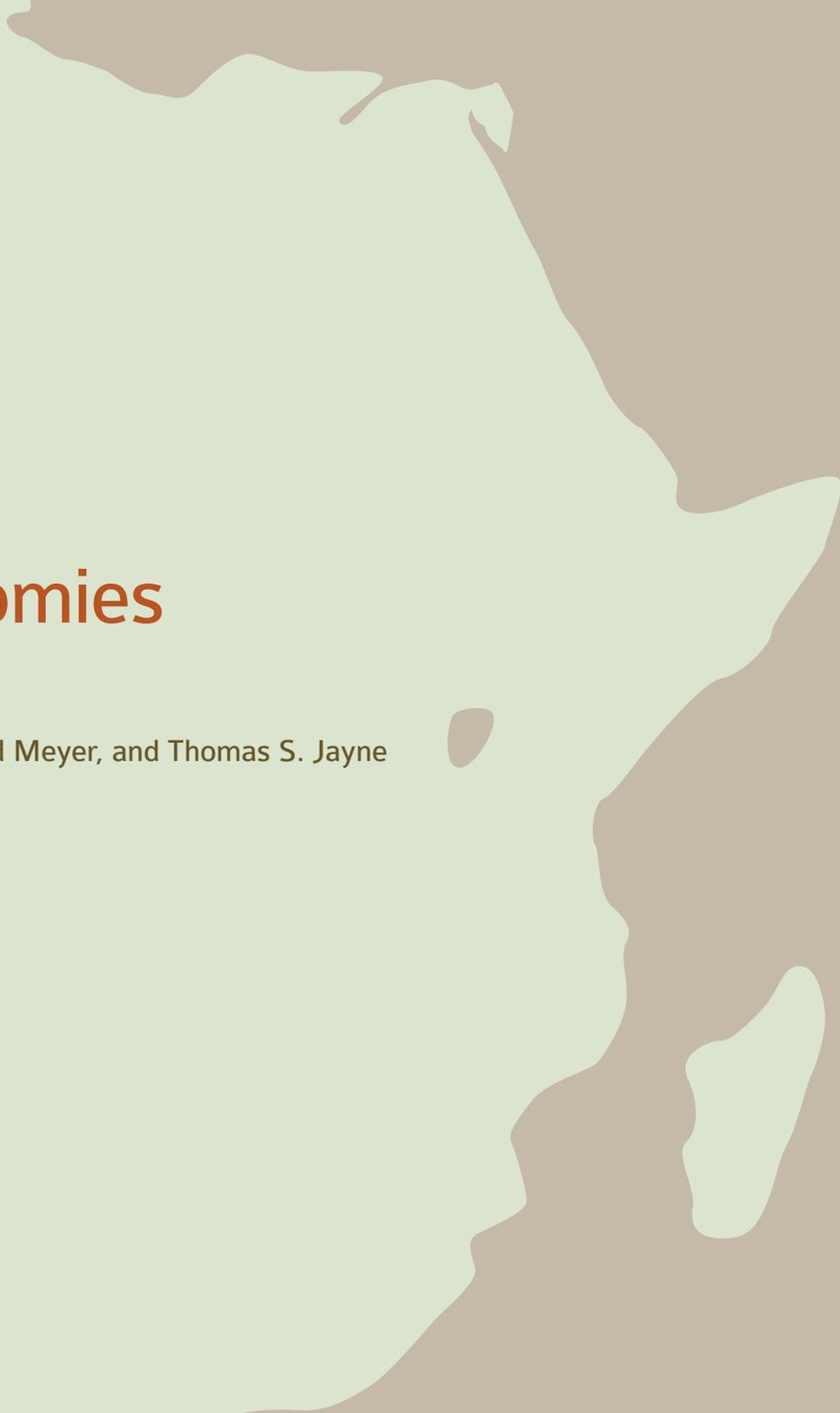
**TABLE 2.19—INCREASED GDP SCENARIO INCREASES
(compared to BSLN-CC) IN AGGREGATE
COMMODITY NET IMPORTS FOR AFRICA
(million metric tonnes)**

	2030	2050
Cereals	-14	-14
Fruits & vegetables	-23	-44
Oilseeds	-1	-1
Pulses	-1	-1
Roots & tubers	-4	-5
Meat	-4	-8

Source: Authors, IMPACT Baseline Projections 3.2, July 2015.

Conclusions

Many examples of agriculture sector development that will help spur accelerated growth of national incomes can be found within the CAADP work programs. AgInvest Africa (www.aginvestafrica.org) from ReSAKSS, in particular, houses documentation on an extraordinary diversity of opportunities for investment that can be expanded or adapted to broader geographies. With the drive toward greater mutual accountability with the 2014 Malabo Declaration, there is an opportunity to build the CAADP and ReSAKSS efforts into more established pathways for transfer of technologies and lessons learned. Deeper and longer-term analysis of particular alternatives, such as in Hachigonta et al. (2013), Jalloh et al. (2013), Rosegrant et al. (2014), You et al. (2011), and Waithaka et al. (2013), can also help inform policymaking in agriculture sector investment. The scope of investments includes crop variety development (particularly for certain climate-adaptive traits, such as drought and heat), improved nutrient and soil management, irrigation development, road and communications infrastructure, and access to improved financial markets. In combination with targeted investments and evidence-based policymaking in a broad spectrum of sectors of the African economy, these types of developments will lead Africa into a more stable and food-secure future with advancing levels of human development.



CHAPTER 3

Megatrends and the Future of African Economies

Lulama Traub, Felix K. Yeboah, Ferdinand Meyer, and Thomas S. Jayne

Introduction

After decades of lethargy, much of Africa is now experiencing rapid economic transformation.⁶ Half of the world's 10 fastest-growing economies are in Africa, south of the Sahara (Kearney 2014). Africa's dynamism has spawned “foresighting” exercises to identify megatrends⁷ driving the region's economic transformation and anticipate the future challenges and opportunities associated with these trends. Among the most frequently cited trends are the rise of the African middle class (AfDB 2011; Hattingh et al. 2012; Deloitte and Touche 2013), rapid urbanization and consequent shifts in food demand and downstream modernization of the food systems (Tschirley et al. 2013), a rapid shift in the labor force from farming to nonfarm jobs (Fine et al. 2012), and rising global interest in African farmland (Deininger and Byerlee 2011; Schoneveld 2014).

This article argues that these projections about Africa's future are a good deal less certain than the conventional wisdom might suggest. Foresighting exercises are often based on tenuous evidence of key underlying trends and tenuous assumptions about the degree to which these trends are inevitable exogenous forces. Most current trends are neither irreversible nor inevitable. Just as the current trends being observed in African food systems are the outcomes of the policies and public investment patterns of prior decades, the future will be shaped and transformed by today's policy actions—either those taken proactively or those taken

passively as a result of no action (Seidman 1973). This point may be underappreciated by development thinkers who speak in terms of inevitable transformations.

The evolution of Africa's economic systems ultimately reflects the investment decisions of the private sector, which constitutes both formal registered companies and millions of informal microenterprises. Yet the pace and composition of private investment is determined by the enabling environment set by governments (consider the difference between North and South Korea, for example).⁸ Given the strong commitments made by African heads of state under the Comprehensive African Agricultural Development Programme (CAADP), our focus is on what the public sector can do in the first instance to generate the incentives for systemwide private investment in food systems that contribute to equitable growth.

This article has two objectives. Our first is to clarify how megatrends, often considered to be shaping the region's economic, political, and social landscapes, are actually quite dependent on other related processes that are either highly uncertain or within the capacity of governments to alter. Toward this end, we consider which of the commonly articulated trends and transformations are indeed exogenous from the standpoint of African policymakers over the next decade and which are endogenously dependent on other, more fundamental processes that are within the realm of policy to influence. Remarkably different scenarios are plausible, with very different growth and distributional outcomes, contingent on the policy actions taken by African

6 Economic or structural transformation can be defined as shifts over time in the sectoral composition of the labor force (de Vries et al. 2013). A healthy transformation process typically is associated with diversification of the economy and specialization at firm/household level.

7 A megatrend is a social, economic, political, environmental, or technological change that is typically slow to form yet, when in place, exerts major influence on human behavior.

8 By enabling environment, we mean the integrity and efficiency of public institutions affecting commerce and trade; the economic policies influencing the returns to investment in particular sectors and areas; the pattern of public expenditures in infrastructure, education, health, research and development, subsidies, and taxation policies; and the degree of stability and predictability in the political-economic system. Inevitable policy variability across countries poses additional problems for generalized predictions of Africa-wide trends and transformations. Clearly the main features of change in agrifood systems and overall economies will vary greatly across areas of the continent.

governments. Time scale matters: The near term holds greater certainty. The farther forward we project, the more scope for the future to be shaped by long-term policy choices—those taken either implicitly or explicitly.

This then leads to our second objective, which is to contribute to a greater societal awareness of the potential to shape future outcomes through engagement in the political process within existing policy-dialogue platforms under CAADP. Rather than adopting analytical frameworks that reinforce perceptions of predetermined outcomes being driven by exogenous megatrends, we argue that a major role of the state is to engage the public and civil society in seeking greater consensus on matters of social policy, informed and guided by research evidence. Based on the goals and priorities identified through this process, the state then implements the policies and make investments that will guide private capital toward achieving these goals, anticipating the impacts of the trends that cannot or should not be altered and planning accordingly.

Based on this analysis, the chapter sketches out four plausible scenarios of how future African food systems might develop over the coming decades and shows how policy choices will influence whichever of these four scenarios actually manifests. This analysis may be of interest to civil society in promoting public discussion of what the dimensions of a “good society” might look like and the types of policy decisions required to achieve it. Our analysis may also help policymakers understand the policy options at their disposal to bend certain trends or forces in particular directions that may be considered socially desirable. It may also help public- and private-sector analysts involved in foresighting projections.

Megatrends Affecting African Economies

We highlight the following eight trends as being among the most important drivers of change in African agrifood systems.⁹

Trend 1: A higher mean and volatility of food and energy prices. Food prices have risen sharply and become more volatile since the global food price surge of 2007/08. Even though 2015 has witnessed a sharp fall in food prices, international maize, rice, and wheat prices in early 2015 adjusted by two different global deflators (the US gross domestic product (GDP) deflator and the global Manufacturing Unit Values Index) are roughly 42, 48, and 35 percent higher, respectively, in 2015 than their averages between 1995 and 2005. World maize, rice, and wheat prices over the 2006–2015 period are 68, 66, and 55 percent higher, respectively, than their inflation-adjusted 1995–2005 averages. Because every region of Africa is a net importer of staple food commodities, food prices in Africa have become and are likely to remain at very high import parity levels for the foreseeable future.¹⁰

Factors that are likely to keep future food prices relatively high in Africa include the following:

- Continued high population growth rates
- Rising income growth and hence demand for food in areas of the world that were historically poor
- Rising global demand for livestock products (which raises the demand for grain used in feed rations)
- An apparent slowing of grain productivity growth in major grain breadbasket regions of the world (Grassini et al. 2013; Cassman et al. 2010)

⁹ This article focuses on Africa south of the Sahara and uses the term *Africa* as shorthand. These trends are often presented as overarching ones with a pan-African reach, though their relative importance varies somewhat across countries as will the responses of African governments to them.

¹⁰ Import parity prices are defined as the world price plus international and local marketing costs to a particular destination.

- Greater costs of bringing new land under cultivation (for example, Chamberlin et al. 2014) and growing scarcity of productive resources (water and land) in Asia
- The growing connection between global food prices and energy prices, at least until such time as the world becomes less dependent on finite, nonrenewable sources of energy

However, the long-term perspective for food and energy prices will depend on the pace of new technologies for generating food and energy (Westhoff 2010). Both of these are major unknowns and highly influenced by policy decisions in the major food- and energy-producing regions of the world. Projections differ greatly on the long-term direction of food prices; compare, for example, the International Food Policy Research Institute's projections (for example, Rosegrant et al. 2012) with those of Baldos and Hertel (2014), Food and Agricultural Policy Research Institute FAPRI at the University of Missouri, and the Organization for Economic Cooperation and Development / Food and Agriculture Organization of the United Nations (OECD/FAO), which suggest that inflation-adjusted prices of the major grains and oilseed will be constant over the next decade with growing production levels comfortably meeting the growing demand for food.

Few, if any, African governments have the ability to affect world food price levels, and most have only limited ability to insulate their domestic food markets from secular changes in world market conditions, especially over a sustained period. This particular trend is therefore largely exogenous from the standpoint of individual African governments. Moreover,

the trend in global food prices over the coming several decades will be increasingly dependent on other megatrends, including the likelihood of much higher global prices of fresh water to maintain existing global breadbaskets (Strzepek and Boehlert 2010) and the growing connections between future land expansion and climate change.

Trend 2: Improved macroeconomic management. Macroeconomic management has improved dramatically in the post-structural adjustment period. Since 2000, few African countries have been massively in debt, requiring bailouts from international financiers and experiencing hyperinflation or rapid currency depreciation. A report from the McKinsey Global Institute indicates that African countries trimmed their foreign debt by one-fourth and shrunk their budget deficits by two-thirds between 2000 and 2008 (Roxburgh et al. 2010). The continent has also experienced rapid economic growth since the mid-1990s, with several countries recording growth rates above or near 7 percent.¹¹ Even during the crises of the global food and financial markets, African economies maintained average growth rates well above the global average of 3 percent. This positive growth trend has been attributed to high prices of oil, minerals, and agricultural commodities over the past decade as well as improved macroeconomic conditions and prudent sectoral reforms, including in the agricultural sector, that have improved the enabling environment for private investment across the continent (ACET 2014). Many African countries have experienced sustained agricultural productivity growth since 2000 (Jayne et al. 2015).

¹¹ In fact, 6 of the world's 10 fastest-growing countries in 2000–2010 were Angola at 11.1 percent a year, Nigeria 8.9 percent, Ethiopia 8.4 percent, Chad 7.9 percent, Mozambique 7.9 percent, and Rwanda 7.6 percent (IMF African Economic Outlook 2013).

Due to prudent monetary policies, the continent's inflation rate has decelerated since 2009, with variations across countries.¹² Median inflation for Africa, which increased from 3.4 percent in 2002 to about 10.5 percent following the global food crisis in 2008, has declined and is expected to fall below 5.0 percent by 2015 (AfDB et al. 2014). The relative stability of African countries' macroeconomies over the past 15 years has attracted greater foreign investment in recent years. Since 2000, external financial flows into Africa have quadrupled, reaching more than US\$200 billion in 2014 and expected to further increase in the coming years (AfDB et al. 2014).¹³ At the same time, tax revenues as a form of internally generated funds continue to rise across the continent. In 2012 low-, lower-middle, and upper-middle income countries in Africa south of the Sahara mobilized about 16.8, 19.9, and 34.5 percent, respectively, of their GDP in tax revenues (AfDB et al. 2014).

While improved macroeconomic management is likely to persist and positively affect African economies well into the future, it is clearly endogenous from the perspective of African governments. Future growth may depend on the extent to which governments are able to anticipate shocks to the system and implement policies that maintain macroeconomic stability. For example, for resource-rich countries whose growth has been supported largely by the commodity boom, the extent to which they invest to diversify their economy will shape their future growth trajectory in the event of declining prices of oil or other commodities.

Trend 3: Rapid urbanization and rising per capita incomes giving rise to an African middle class. Recent studies have provided evidence of a rising middle class in Africa (for example AfDB 2011; Kearney 2014; Deloitte and Touche 2013; Tschirley et al. 2014). On this basis they project a rapid modernization of Africa's food systems and diets, with major employment growth being envisioned in the downstream stages of the food systems. However, these conclusions are highly sensitive to how middle class is defined.¹⁴ Potts (2013) argues that urban income growth is quite narrow in most African countries for which data exist. Jedwab (2013) and Gollin et al. (2013) indicate that GDP growth in many African countries is driven by narrow growth in natural resource sectors, which contribute woefully little to employment creation and raise the specter of urbanization without income growth or economic transformation. An otherwise bullish assessment by the McKinsey Global Institute (Fine et al. 2012) indicates that under the most favorable scenario the supply of wage jobs in manufacturing, services, and government is not growing rapidly enough to absorb more than two-thirds of the region's rapidly rising labor force. Other sources argue that urban income growth is robust and relatively broadly based (Young 2012; Tschirley et al. 2013; McMillan and Harttgen 2014a and 2014b). Therefore we note a lack of consensus on this issue.

It has long been argued that income growth restricted to a narrow segment of society produces weaker growth and employment multipliers than would be the case if the initial income shock were broadly based.

¹² In 2013, only five countries in Africa south of the Sahara recorded double-digit inflation (Eritrea, Ghana, Guinea, Malawi, Sudan), relative to 13 countries in 2012, while 16 countries in recorded inflation rates below 3 percent in 2013 (AfDB et al. 2014).

¹³ The 2014 African Economic Outlook Report projects that foreign investment and official remittances to Africa could reach more than US\$80 billion and US\$67.1 billion, respectively, in 2014.

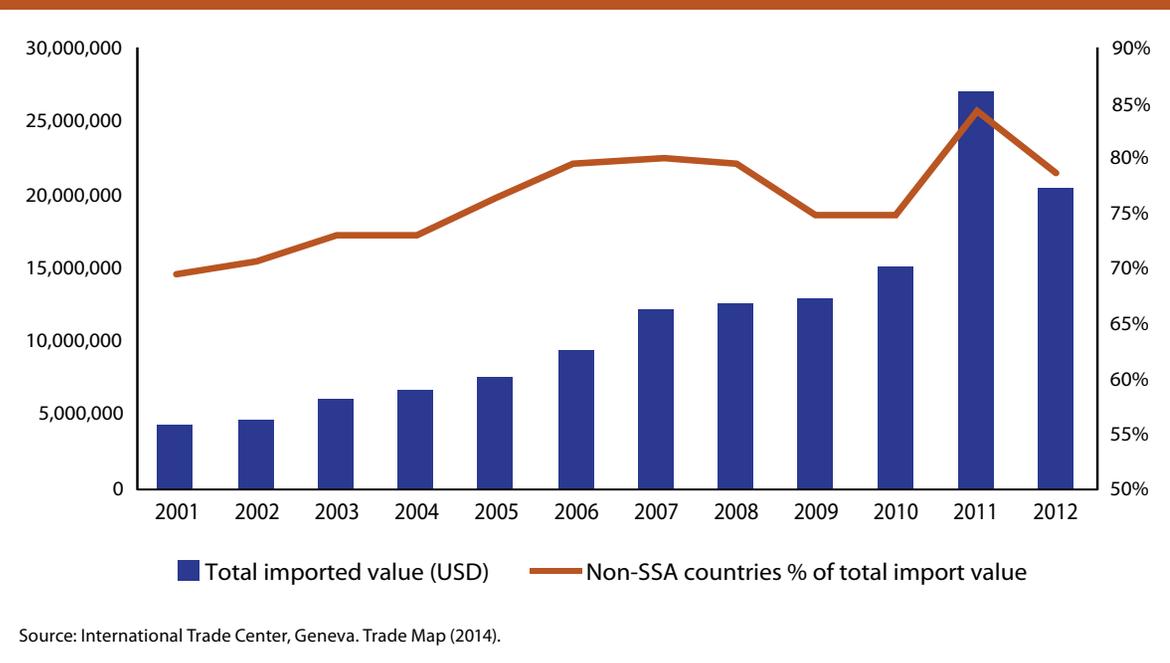
¹⁴ The African Development Bank (AfDB) defined *middle class* as per capita daily consumption of US\$2–20 in 2005 purchasing power parity. Further it found that this group had risen from 27 percent to 34 percent of the population between 1990 and 2010. However, about 60 percent of the middle class in 2010 were in the US\$2–\$4 per capita consumption group—barely out of the poor category and in constant threat of falling back into it (AfDB 2011). If this group is excluded, the rise in Africa's middle class over the past two decades would appear to be quite modest. There is evidence of rising incomes at least among a small segment at the top end of the income distribution.

The potential for urbanization and income growth to stimulate job expansion in downstream segments of the food system of course depends on where the primary agricultural products come from. If domestic farm production is able to keep up with rising urban demand, obvious growth of jobs will occur in food assembly, wholesaling, and meeting the demand for food away from home, in addition to processing and retailing. In contrast, if domestic production cannot keep up with food demand, imported food (both processed and raw) will take an increasing share of consumers' expenditures. The importation of processed foods may still stimulate job growth in food retailing, but will cause loss of potential for job expansion at the upstream stages of the food system, including agricultural input supply and agrobusiness

services, farm production, financial services for the farm sector, storage, and local trading, which can otherwise occur if consumer demand is met through domestic production. Capturing the potential of urban growth to stimulate employment growth in the agrifood system will hence depend on stimulating the domestic production base—itsself a potentially major source of growth in wage employment and self-employment in the coming decades (Losch 2012; Filmer and Fox 2014).

Worries about the loss of jobs within the agrifood system to foreign suppliers appear warranted. The data in Figure 3.1 demonstrate that while

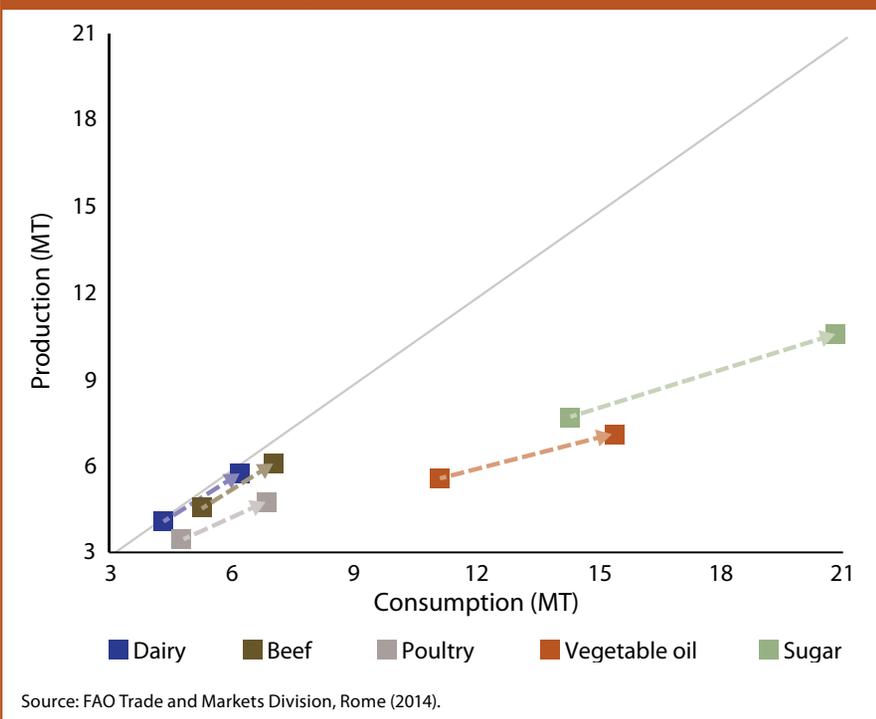
FIGURE 3.1—IMPORTS BY AFRICAN COUNTRIES OF PROCESSED, SEMIPROCESSED, AND HIGH-VALUE FOOD PRODUCTS AND THE SHARE OF IMPORTS ORIGINATING FROM OUTSIDE AFRICA¹⁵



Africa's demand for semiprocessed, processed, and high-value foods (many of which are considered basic food staples) is rising rapidly, this demand is increasingly being met by world markets. The value share of this imported food originating from outside Africa rose from 70 percent in 2001 to about 80 percent since 2010. Projections by the OECD and FAO of Africa's consumption and production of high-valued commodities over the period 2011–2023 also indicate that an increasing share of the region's growing demand for food products will be met by imports (Figure 3.2). Private firms in the region repeatedly warn that while urban populations and hence

¹⁵ The food products included in this figure follow Womach (2005) and are divided into three groups: (1) semiprocessed products, such as fresh and frozen meats, staple grain meals and flour, vegetable oils, roasted coffee, tea, and sugar; (2) highly processed products that are ready for the consumer, such as milk, cheese, wine, and breakfast cereals; and (3) high-value unprocessed products that are also often consumer ready, such as fresh and dried fruits and vegetables, eggs, and nuts

FIGURE 3.2—PRODUCTION AND CONSUMPTION TRENDS IN HIGH-VALUED FOOD COMMODITIES FOR AFRICA, 2011 TO 2023



demand are growing rapidly, major concerns exist over whether adequate supplies can be sourced through local production to meet this demand. Concerns over the scope for local production to respond to rising consumer demand are especially warranted in many countries where the potential for expansion of high-potential cropland is limited (Chamberlin et al. 2014). Export-oriented private-sector firms also acknowledge that Africa may be exporting agricultural commodities, but that most of the processing and value-added is carried out internationally.

The pattern of trade shown in Figures 3.1 and 3.2 implies that the growth of employment and value addition within local agrifood systems is to some extent being captured by overseas suppliers. This employment growth could have been captured by local producers and agribusiness marketing and processing stages of the food system if urban demand were more effectively met by local production. The rate of new private investment and the transformation of value chains at the assembly, wholesaling, and processing stages of the food system will depend on the extent to which domestic food production keeps pace with demand or is lost to foreign suppliers.

Furthermore, the view that Africa is rapidly urbanizing is also highly contested. Prior to 2005, the United Nations concluded that Africa was the most rapidly urbanizing region of the world (for example, Cohen 2004), owing in large part to rapid urban-to-rural migration. The UN later modified its projections based on more recent evidence that urbanization is generally lower and considerably more variable across countries (Bocquier 2005; Potts 2012).¹⁶ Furthermore, according to Potts (2013), over the past three decades the trends in the cost of living has often exceeded that of incomes in urban areas, intensifying the economic vulnerability of most urban households and contributing to circular migration between urban and rural areas.

The rates of migration and urbanization are responsive to public-sector actions that affect the relative costs of living in rural and urban areas and the relative returns to labor in agriculture and nonfarm employment (Harris and Todaro 1970). Policies and investment patterns vary greatly across countries, owing to highly varying political and historical conditions.

¹⁶ In some areas of Africa, rural-to-rural migration may exceed rural-to-urban migration (Bilsborrow 2002).

For these reasons, and based on the empirical record to date, we conclude that some areas of Africa may experience broad-based income growth and urbanization over the next several decades. But the pace and extent to which this occurs is likely to vary substantially across countries, depending on government policies and the composition of public expenditures.

Trend 4: Rapid increase in the number of young people entering the labor force because of Africa's unique demographic structure. Over 60 percent of Africa's population is currently below the age of 25. Roughly 17 million people will enter the labor force each year over the next decade (Losch 2012; IMF 2015). Fine et al. (2012) estimate that given current rates of employment growth, less than half of these people will be absorbed into gainful off-farm wage jobs. Even under the most favorable policy and growth scenarios, the urban and nonfarm sectors can absorb at the most two-thirds of the youth entering the labor force into off-farm employment. Therefore, the viability of family farming is likely to determine whether the remaining youth who are seeking jobs are productively engaged in agriculture and the informal sector (which is heavily dependent on agriculture as a source of demand), or whether they join the ranks of the unemployed. The latter scenario will bring major political risks. Fortunately, policy and public investments can rapidly improve the incentives and the profitability to engage in farming—a major opportunity both for the youth and for governments.

This trend is perhaps the one with the highest degree of certainty, and one that African governments can proactively anticipate and respond to. Instituting¹⁷ an enabling environment that rapidly promotes private investment and job creation in nonfarm sectors and labor-intensive forms of

agriculture would have high payoffs and raise the likelihood that a country's economic transformation will be relatively smooth rather than painful and protracted. We discuss what such an enabling environment might look like in Sections 4 and 5.

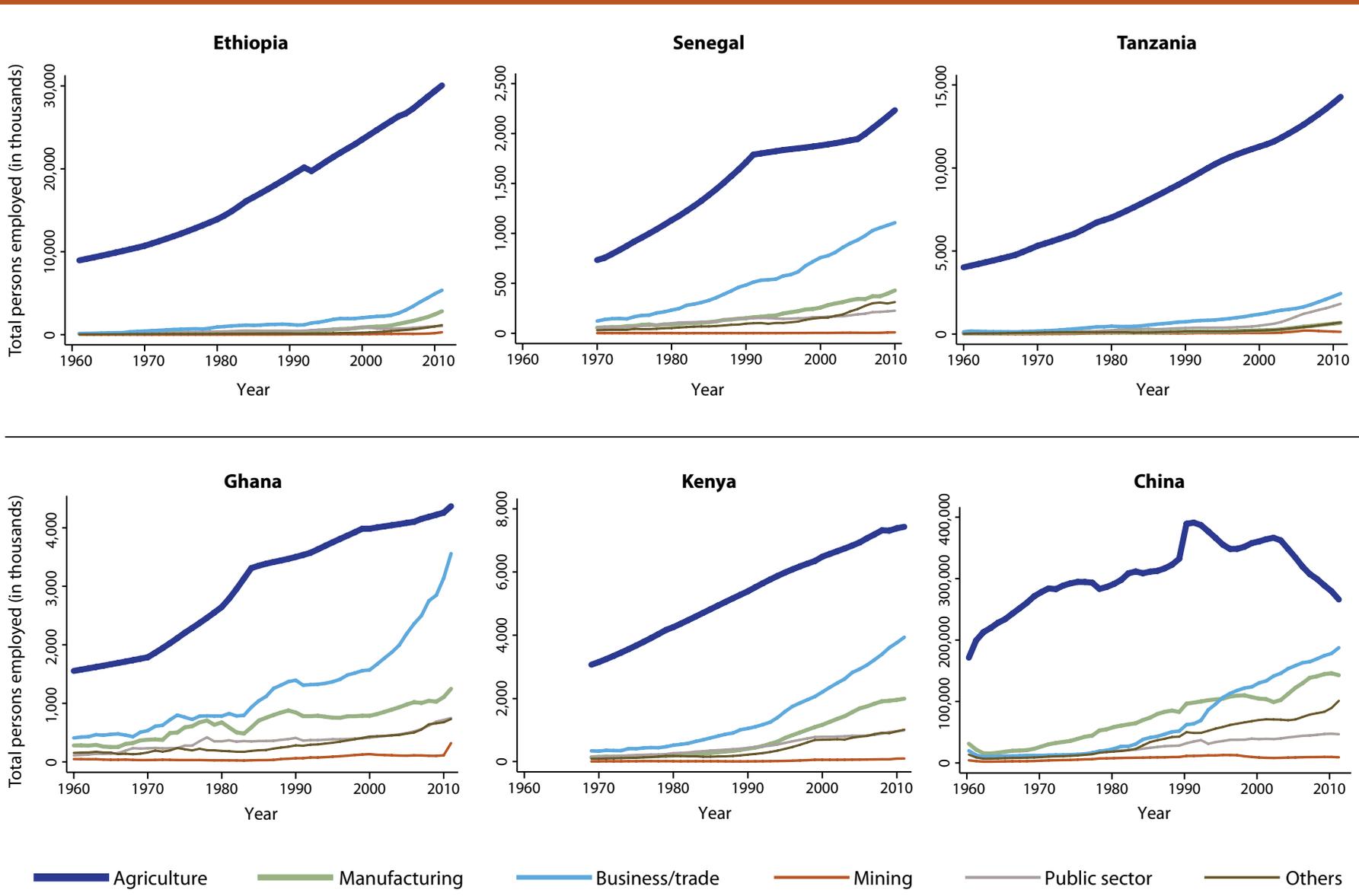
Trend 5: Rising nonfarm job opportunities, but agriculture likely remaining the single largest source of employment for at least the next several decades.

Where will these young Africans be employed? Will most Africans continue to be involved in farming as in prior decades, or will we see rapid structural transformation toward nonfarm employment? Urbanization and income growth (or possibly mainly population growth) do appear to be causing some shifts in the labor force from farming to nonfarm sectors as well as the downstream stages of food systems. Tschirley et al. (2015), for example, project that the percentage of employed people located in the downstream stages of African food systems will rise from 8 percent of total employment in 2010 to 12 percent or more by 2025, and that 17 percent of all new jobs created in the economy over this 15-year period may be in these downstream stages of the food system (retailing, processing, food preparation away from home). They also project that the jobs in the nonfarm economy over the same period may rise from 17 percent to 28 percent.

However, in the recent past the number of people employed in primary agriculture rose in select African countries (Figure 3.3). Compared with China, where the agricultural labor force peaked around 1990 and has since been declining, each of the eight African countries examined by Yeboah and Jayne (2015) using national census data show increases over time in the number of people primarily employed in agriculture.

¹⁷ Specific policies and investments, consistent with broad-based agricultural growth and poverty reduction, include investments in physical infrastructure (such as roads, rail systems, ports, and electrification), policies favorable to family farming, agricultural R&D, education, and farm extension programs (Fan et al. 2008; EIU 2008).

FIGURE 3.3—TRENDS IN SECTORAL EMPLOYMENT IN VARIOUS COUNTRIES



Source: Groningen Global Development Center (2013).

Consistent with employment trends by the Groningen Global Development Center (2013), a recent flagship World Bank report (Filmer and Fox 2014) projects that family farming will remain the single largest source of employment for at least the next several decades.

However, most African countries are experiencing a declining share of the number of people employed in farming over time, indicative of some diversification of employment away from farming into nonfarm employment sectors. Results from nationally representative multiyear and multicountry survey data over the past decade show that the proportion of the working-age population involved in farming is declining in most but not all countries (Yeboah and Jayne, 2015). At the same time, there is a corresponding growth in the share of people employed in the nonfarm sectors (Table 3.1). This observed growth in the share of nonfarm employment is largely concentrated in construction and manufacturing, nonagricultural commerce and transportation, services in the informal sectors, as well as downstream agriculture-related wholesale and retailing activities. These findings are consistent with other studies (for example, Badiane, Ulimwengu, and Badibanga 2012; McMillan and Harttgen 2014a and 2014b), suggesting a gradual transformation of African economies from agricultural to nonfarm employment in the service sector.

Moreover, urbanization in Africa does not mean that agriculture will decline in importance as a source of livelihood for many if not most of Africa's population. Recent surveys show that farming is the primary source of livelihood for between 10 and 25 percent of urban households. To some extent this occurs due to reclassification of localities from rural to urban once a threshold number of households is exceeded. But this is only part of the story. Development Health Surveys (DHS) data indicate that households

whose primary residence is urban control 10–30 percent of total national agricultural land, and this share has risen in recent years for most of the countries with multiple years of data (Jayne et al. 2015).¹⁸ The jump in world food prices since 2008 has made farming very profitable for those with sufficient capital to acquire good agricultural land and use modern inputs. Wealthy urbanites are increasingly investing in land for both speculative reasons and for income generation through farming (Jayne et al. 2015).

This view of rising agricultural landownership among urban households is corroborated in some countries by data on employment trends in census and Living Standard Measurement Study (LSMS) survey data. The number of working-age men and women employed primarily in farming is rising quite rapidly in Kenya, Nigeria, and Tanzania, more rapidly than the overall growth in the labor force in all three countries. In Kenya and Tanzania, the fastest growth in farming among urban residents is in the oldest age categories (45–54 and 55–65 years of age) for both men and women. This pattern is not replicated in all countries. Forthcoming analysis of employment trends by Yeboah and Jayne (2015) show two distinct patterns, where sustained agricultural productivity growth during the 2000–2013 period appears to be correlated with the recent growth rates of employment in farming among urban households, while sluggish agricultural growth rates is in most cases associated with slow (or even negative) rates of growth in the number of urban people stating their primary employment to be in farming. Countries such as Mali, Malawi, and Zambia are in the latter category. However, across most of the countries analyzed by Yeboah and Jayne, the number of working-age people in rural areas who are primarily engaged in agriculture, while generally growing, is declining as a share of the total labor force over time.

¹⁸ These are likely to be underestimates of the true extent to which national agricultural land is controlled by urban-based households, for reasons described in Jayne et al. (2015).

TABLE 3.1—STRUCTURE OF EMPLOYMENT OVER TIME FOR GHANA, TANZANIA, AND ZAMBIA

EMPLOYMENT CATEGORY	% SHARE OF THE POPULATION EMPLOYED					
	Ghana		Tanzania		Zambia	
	2005	2013	2008	2012	2005	2012
Within agrifood systems						
Farming*	52.91	43.80	64.93	55.74	73.79	56.88
Downstream agroprocessing and manufacturing	6.12	3.64	0.79	0.90	1.23	1.57
Downstream agricultural commerce**	6.69	14.09	4.50	5.00	1.85	6.34
Outside agrifood systems						
Forestry and mining	1.25	1.90	0.79	1.12	1.54	2.83
Manufacturing and construction	7.43	8.74	5.31	8.26	3.52	5.89
Professional and technical services	7.78	8.91	8.38	7.31	5.39	7.75
Financial and real estate	0.47	0.99	0.53	0.37	0.63	0.80
Transportation and commerce	14.12	13.45	12.16	17.05	9.43	9.15
Arts, entertainment, and recreation	0.29	0.43	0.30	0.58	0.20	0.16
Communal and personal services	2.95	4.06	2.31	3.67	2.41	8.65
Total employment as % of working-age (15–64 years) population	68.43	79.78	64.57	71.54	79.00	70.36
Source: Ghana Living Standard Surveys 5 and 6; Tanzania National Panel Surveys (2008 and 2012); Zambia Labor Force Survey (2005 and 2012). *Farming comprises crop and livestock production activities including fishing, aquaculture, and hunting. **Downstream agricultural commerce comprises wholesale and retail of agriculture-related products.						

In light of these trends, we expect employment opportunities in some nonfarm sectors to continue to rise rapidly, but agriculture will still remain the main source of employment over the next several decades in most African countries. Policies that enhance productivity in agriculture appear to have the greatest potential to directly improve rural livelihoods and stimulate effective demand and growth in the nonfarm job opportunities through multiplier effects that may be generated from the productivity gains.

Trend 6: Rapid concentration of farm structure and marketed surplus from agriculture. The demand for agricultural land in Africa has risen dramatically since the surge in global food prices starting in 2007. Agricultural subsidies and land policies in many countries have accelerated the demand for land. Recent evidence indicates that relatively wealthy people (both rural and urban) are investing in land at an unprecedented rate, leading to the rapid rise of medium-scale farmers in Africa. A study of three countries (Ghana, Kenya, and Zambia) by Jayne et al. (2014a) indicates that medium-scale farms control more land than large-scale foreign investors in all three countries and control more agricultural land than small-scale farmers in two of the three countries. Evidence also suggests that existing land policies are leading to increased inequality of landholdings and in some cases may be making it more difficult for area expansion in densely populated smallholder farming areas (Jayne et al. 2014a; Woodhouse 2003).

Farm lobbies have also changed their complexion over time and are increasingly dominated by urban-based and politically influential

medium- and large-scale farmers (most farming in the range of 20 to 100 hectares). This group has progressively steered agricultural policies and public budgets in their favor through input subsidy programs targeted to “progressive” farmers and through commodity price support programs and import tariffs that reward those with the greatest surpluses to sell.¹⁹ Ironically, most small-scale farms are net staple-food buyers and are adversely affected by the lobbying of national unions of farmers aimed at raising grain prices (Jayne 2012).

However, these trends reflect the incentives embodied in land and agricultural policies over the past several decades. Future farm structure and income growth from agriculture are highly malleable to alternative land and agricultural policies. We are inclined to agree with Woodhouse (2003) that farm structure and farm commercialization are likely to become more concentrated over time in most countries unless land and farm policies are put in place to actively reverse these trends.

Trend 7: Widespread soil degradation in densely populated African farming systems. Land pressures in the densely populated farming areas of Africa are causing a gradual shrinking of farm sizes over time (Headey and Jayne 2014). Smallholder farmers respond by more continuously cropping their fields every year. Fallows have largely disappeared in densely populated areas.²⁰ Continuous cultivation of existing plots would not necessarily pose problems for sustainable intensification if soil quality was maintained or improved over time through sufficient use of fertilizers, soil amendment practices, and other land-augmenting investments. However, a major body

¹⁹ Similar processes of elite capture of public agricultural expenditures in Latin America are discussed by López and Valdés (2000).

²⁰ Fuglie and Rada (2013) report that fallowed land as a proportion of total farmland in Africa south of the Sahara has declined from 40 percent in 1960 to roughly 15 percent in 2011. Jayne et al. (2014b) report that fallows have largely been eliminated in smallholder farming areas containing more than 250 people per km² of arable land.

of evidence in Africa points to soil degradation arising from unsustainable cultivation practices in high-density areas of the continent (for example, Stoorvogel and Smaling 1990; Drechsel et al. 2001; Tittonell and Giller 2012).²¹ Loss of micronutrients and soil organic matter pose special problems, both because they cannot be ameliorated by the application of conventional inorganic fertilizers and because they tend to depress the efficiency of inorganic fertilizer in contributing to crop output (Shaxson and Barber 2003; Marenya and Barrett 2009; Vanlauwe et al. 2011). Because of continuous cultivation and lack of crop rotations,²² soil organic carbon levels have reached very low levels in high-population-density Africa (Powlson et al. 2011; Vanlauwe et al. 2011). Giller et al. (2006) and Tittonell et al. (2007) conclude that smallholder farmers are largely unable to benefit from the current yield gains offered by plant genetic improvement due to their farming on depleted soils that are nonresponsive to fertilizer application. The problem of soil mining has the classic elements of a “social trap” (Platt 1973), in which people adopt behaviors that are consistent with their short-term livelihood objectives but produce unsustainable and potentially disastrous long-term consequences. Rising rural population density and associated land pressures are important underlying drivers of these processes, yet they are clearly within the scope of policy to ameliorate. A more holistic approach to sustainable agricultural intensification can succeed in reversing these trends and creating the potential for productivity growth in high-density smallholder environments (Snapp et al. 2010; Powlson et al. 2011).

²¹ Common forms of soil degradation include declining nutrient balances (“soil mining”), erosion and loss of topsoil, acidification, and loss of organic matter. An important contrasting study by Tiffen et al. (1994) argues that population pressures between 1950 and 1980 in the Machakos District of Kenya induced households to make land-augmenting investments that contributed to sustainable intensification. However, in a more recent revisit to these same areas in 2014, Kyalo and Muyanga (2014) note that population densities during the period studied by Tiffen et al. were generally below 400 people per km², about half the current densities in many areas of Machakos where widespread soil degradation and unsustainable forms of intensification are apparent.

²² On very small farms, households cannot afford to sacrifice a whole year by planting green manures or crops for which there is limited consumption value because they need to produce as much food as possible for the coming year.

Trend 8: Greater climate variability. The precise impacts of climate change on African farming systems are likely to vary spatially, but two general predictions are greater variability in agricultural production and possibly a decline in crop productivity (Schlenker and Lobell 2010).

In the developed world, 31 percent of total wheat, rice, and maize production has reached a yield plateau, experienced an abrupt decline in yield growth rates, or both (Grassini et Al. 2013). This has serious implications for global food security, as past projections of global food production were based on sustained yield growth in the United States, Europe, and parts of the Far East.

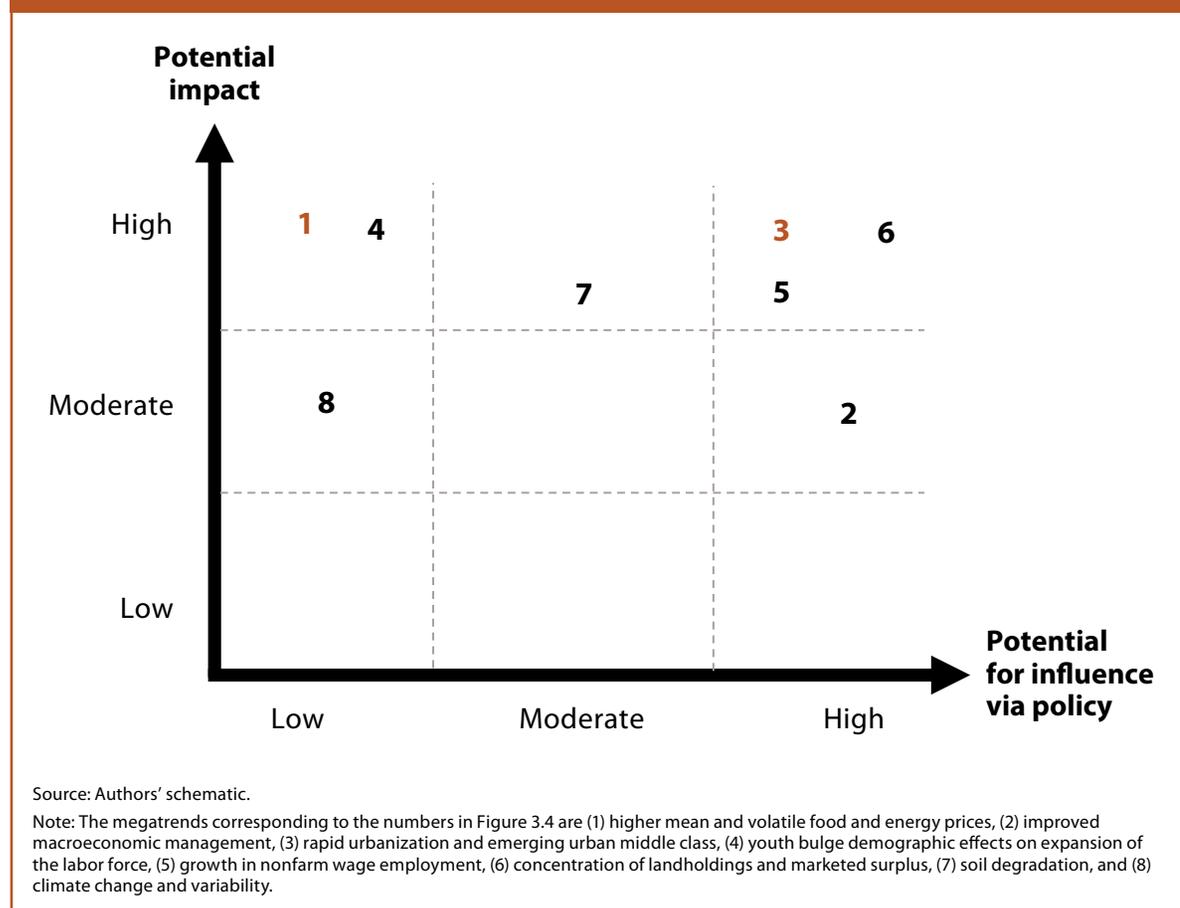
In contrast, Africa’s low levels of yields indicates the potential to experience continued growth in food production before reaching the region’s biophysical limits. Africa and Latin America are experiencing the world’s fastest growth in the share of global farmland under cultivation (Headey 2015). However, feeding the global population through expansion of agricultural land will involve degradation of natural ecosystems. The alternative, ecological intensification of agriculture, would require minimizing the constraints to appropriate technology adoption; focusing on sustainable water use through irrigation; and implementing best farming practices. Given the rising competition for water (to date, 70 percent of available water is used by irrigation farming) it will be imperative that agriculture focus on developing irrigation technology that improves water use efficiency and enhances our ability to adapt to climate change (Cassman et Al. 2010).

Ultimately these effects of climate change are largely exogenous in the short run from the standpoint of African policymakers, but it is quite possible that future land policies affecting the rate at which forest- and grassland are converted to farmland may influence the degree of climate variability experienced in some parts of the region. In this way, factors affecting the supply of and demand for farmland in Africa may affect the pace of this trend in the coming decades. Moreover, if global climate change induces greater volatility in world food prices, this may induce public and private investment responses at certain stages of the food system, for example, local storage and a shift toward food self-sufficiency, or investments in water-saving technologies and adaptive farm-management practices.

Classification of Megatrends

Scenario planning is a foresighting methodology used to make sense of an uncertain future. It allows for a systematic approach to understanding the possible implications of observed trends and provides a framework that categorizes what is inevitable, what is malleable, and in this study the plausible role of public policy in influencing future outcomes. To generate the scenarios, the eight

FIGURE 3.4—CLASSIFICATION OF MEGATRENDS ACCORDING TO IMPACT AND POTENTIAL INFLUENCE VIA POLICY



megatrends presented in Section 2 were ranked, through an iterative process, by the authors according to two dimensions—the **relative impact** on shaping the African food system, and the degree to which the direction or force of

the trend can be **influenced through policy actions**, broadly defined. Figure 3.4 illustrates this ranking.

According to our subjective rankings, African policymakers have little scope to alter Trends 1 (global food and energy prices), 4 (youth bulge), and 8 (climate change), at least in the next decade. In contrast, policy and public investment patterns can do much to bend Trends 2 (macroeconomic management), 3 (urbanization and rising middle class), and 6 (changing farm structure) in socially desirable directions. Taking Trend 3, for instance, major public investment in infrastructure and education, would be likely to stimulate private investment in industry and manufacturing and hence encourage the growth of wage employment in urban areas.

Two of these megatrends are of special importance, both because they are highly uncertain and because they will determine the pace of other trends if they do materialize. These two megatrends are the direction of world food prices and the rate and breadth of urban income growth (Trends 1 and 3). From the standpoint of private- and public-sector stakeholders in the agricultural sector, the first trend is largely exogenous in the sense that stakeholders can do very little to influence the time path of global food prices. However, great scope exists—both through agricultural as well as industrial policy—to influence the pace and breadth of urban income growth. The extent to which urban income growth is broadly based will also depend in part on the nature of future agricultural growth. The contribution of agricultural growth to nonfarm employment through growth multiplier effects is well established and is considered to be one of the central pathways leading to nonfarm growth in Green Revolution Asia (for example, Mellor 1976; Lipton 2005; Fan et al. 2008).

Four Possible Trajectories of Economic Transformation

For the purpose of this analysis, Trends 1 and 3 (the rate of growth in world food prices relative to prices in the rest of the economy, and the pace and breadth of urban employment and income growth) were selected as the key uncertainties underpinning the resulting scenarios. The selection was determined by the high impact potential, the contrasting degree of policy malleability, and the internal and external consistency exhibited by these trends relative to Trends 4 and 6. In particular, these drivers describe uncertainties that could generate probable scenarios that are relevant to all the key stakeholders. Four possible scenarios emerge (Figure 3.5). The projected impacts for each scenario are discussed from the perspective of five stakeholder or interest groups: (1) African governments, (2) traditional authorities, (3) rural communities (the majority of whom are small-scale farmers), (4) urban consumers, and (5) private-sector firms and investors.

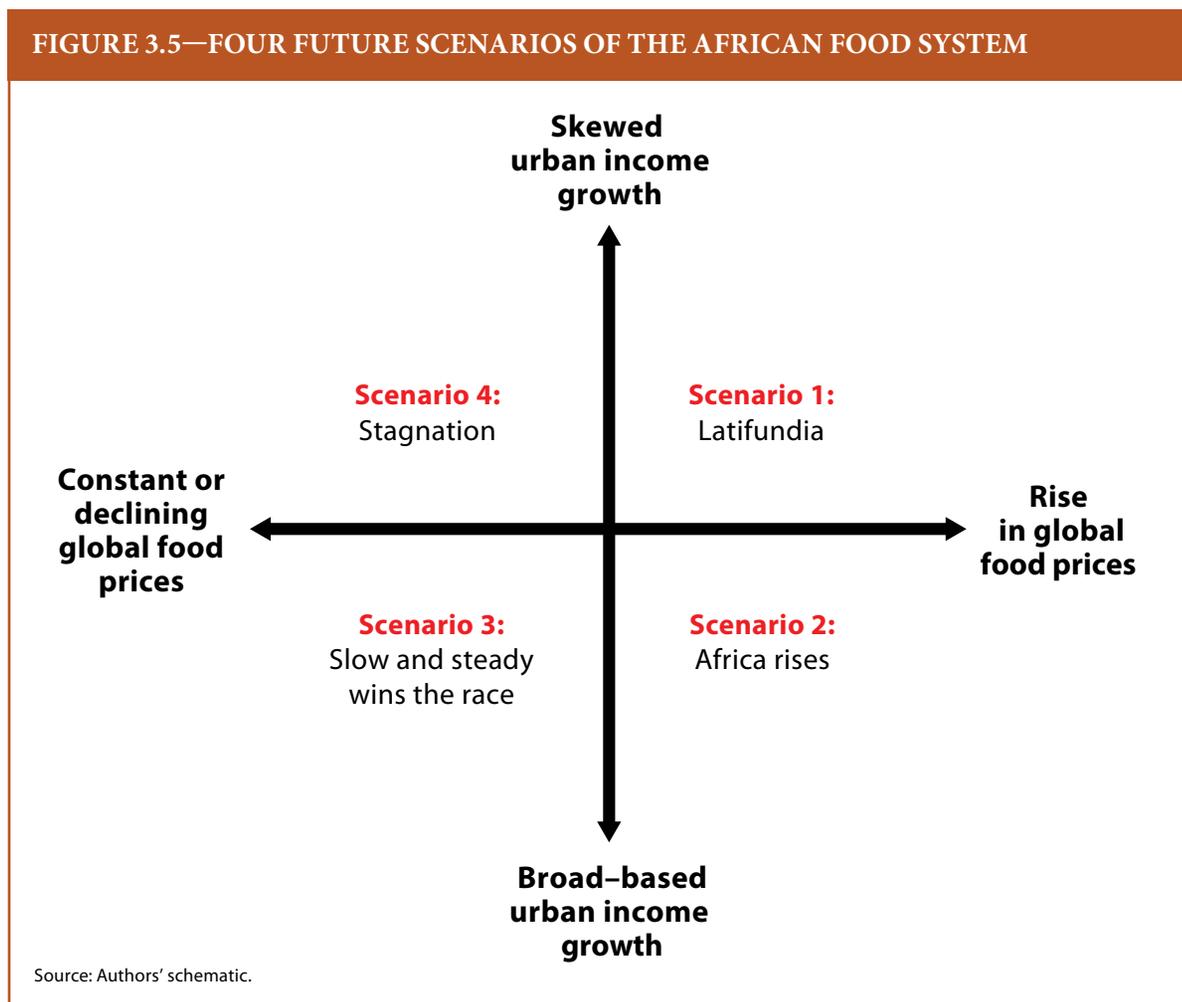
Scenario 1: The Emergence of Latifundia

Assuming that global food prices continue to rise over the next several decades and that urban income growth is quite skewed, with the top 20 percent of urban households realizing a rapid rise in income while the remainder experience little or no growth, we project broad outcomes as noted in the following paragraphs.

Rise of an urban elite: Even if only 10 to 20 percent of urban Africa becomes middle class, the sheer size of Africa’s cities will be sufficient to attract major foreign investment in food retailing and other upper- and

middle-class consumer goods. Consumption patterns among wealthy consumers will slowly shift away from starchy staples and toward animal products, fresh fruits and vegetables, and more convenient processed foods.

Rising food prices driven by the rising demand will attract increased private investment in the development of local value chains to produce and process these products more cheaply than imports. However, whether domestic production indeed becomes a cheaper source of meeting rising domestic demand depends decisively on government policies and public investment patterns. For example, state investment in rural electrification, roads, and irrigation can provide cost advantages to local production and stimulate private investment. Farm lobbies representing the interests of commercialized sellers (many of whom are influential urbanites in government, the private sector, or both) may become quite powerful under this scenario and effectively lobby for public funds to be used in support of domestic food self-sufficiency to protect against foreign competition and the vagaries of a volatile world food market.²³



²³ Despite producing questionable income distributional effects, this line of argument in favor of farm price supports above world market prices has been successfully employed in the past throughout Africa, first by colonial settler farm lobbies and more recently by their African successors (for example, Jayne and Jones 1997; Jayne 2012).

Concentration of agricultural land: This scenario may accelerate the pace at which wealthy and influential people in both urban and rural areas acquire prime agricultural land. Farm lobbies are increasingly being represented by medium-scale farmers, many of whom are educated people with urban-based jobs and relatively new entrants into commercialized farming (Sitko and Jayne 2014; Jayne et al. 2014a). Such circumstances appear to encourage efforts through the political process to convert large tracts of land from traditional tenure structures to statutory tenure systems where land can be privately owned through title deeds acquired through land markets. A skewed pattern of income growth confined to the top 20 percent of urban households would most likely increase their demand for land and accelerate pressures on the state to convert customary land to statutory tenure (where this process has not already been completed). Such changes in land tenure would accelerate already profound shifts in farm structure, featuring rising inequality in land distribution. The Gini coefficients of land distribution in African countries where data are available appear to be rising quite rapidly over time, are now much higher than those in Green Revolution Asia, and are in some cases approaching those of the latifundia agricultural systems of Latin and South America (Jayne et al. 2014a).²⁴

The impacts on farm productivity are unclear. New technologies may provide efficiency advantages to medium- and large-scale farms. While the evidence to date shows an inverse relationship between farm size and efficiency over the range of 1–10 hectares (for example, Larsen et al. 2013; Carletto et al. 2013), very little evidence shows efficiency differences between small, medium (20–100 hectares), and large farms (more than 100 hectares).

In any case, the relationship between farm size and production efficiency is a reflection of prior policies and patterns of public investment (for example, water rights and irrigation investments having been made for the benefit of particular groups at the expense of others).

Greater income inequality: Greater concentration of both consumer demand and landownership may restrict the breadth of economic growth in Africa and retard the poverty-reducing benefits of whatever agricultural growth does occur (Ravallion and Datt 2002). Most crucially, a form of income growth restricted to a narrow segment of society would diminish the income multiplier effects that otherwise might encourage more rapid and inclusive economic transformation.

Stubbornly high poverty rates: Greater concentration of land would be expected to contribute to landlessness and accelerate the rate of outmigration from rural areas experiencing land scarcity. Other things being equal, this would contribute to urbanization. However, if the form of nonfarm employment growth is not broadly based, it will be exceedingly difficult for the nonfarm sector to absorb the 330 million young Africans who will be entering the labor force between now and 2025 (Losch 2012). This could be a politically volatile scenario (Beehner 2007).

Agribusiness firms and investors: A continued rise in global food prices would be expected to elicit continued strong interest in large-scale land acquisitions by agribusiness firms and speculators, as well as domestic

²⁴ For example, the Gini coefficients of landholdings have increased in Zambia from 0.42 in 2001 to 0.49 in 2012, and in Ghana from 0.54 in 1992 to 0.65 in 2005 (Jayne et al. 2014a).

investors, especially for commodities priced at import parity levels. We might also expect large investment firms to approach domestic landowners (many of whom appear to be speculators and not experienced farmers)²⁵ to engage in cooperative production schemes through land lease agreements, and so on. Such arrangements could promote major gains in agricultural production, though it is unclear whether this would be sufficient to keep pace with rising consumer demand without sustained public-sector commitment and expenditures in support of farm productivity growth.

Rural communities/small-scale farmers: High food prices would provide incentives for smallholder farmers to increase their productivity and expand their use of land. Intensified land pressures in densely populated areas will make it difficult for many rural households to do either. A continuation of land allocations to medium- and large-scale investors will indirectly exacerbate land pressures in densely populated rural areas by restricting the supply of unused land in other areas that would otherwise support voluntary rural–rural migration. Continued rural population growth and land subdivision will intensify land constraints in the more densely populated smallholder areas and contribute to forms of unsustainable intensification featuring land degradation. These can be reversed by aggressive state actions to put in place holistic programs of soil rehabilitation and sustainable land intensification (Drechsel et al. 2001; Powlson et al. 2011; Tittonell and Giller 2012).

Traditional authorities: High food prices coupled with a concentration of economic and political influence in urban areas would be anticipated to

intensify pressures to convert land from customary to state-titled land and hasten the demise of traditional governance systems in rural areas.

Scenario 2: Africa Rises

Our second scenario assumes that per capita income growth will be relatively high and broadly based and that global food prices will continue to rise over the next 10 years.

Urban elite: As with the latifundia scenario, we anticipate that rising incomes will hasten changes in food consumption patterns along the classic Engel curve. However, unlike Scenario 1, we anticipate that a growing proportion of this demand will be met by local industries as the more broadly based multiplier effects of broad-based income growth stimulate local investment at various stages of the food systems.

In terms of land acquisitions, increased disposable incomes and investment potential among urban households, combined with expectations of rising global food prices, are likely to increase the rate of new investment in land. Unmet demand for land will create pressures for conversion of land from customary to state-titled land accessible through market purchases. However, unlike in the latifundia scenario, a broad-based pattern of urban income growth will generate growth multipliers that are both stronger and better distributed through the local economy. This would, in turn, allow rural households to remain in agriculture while gradually increasing the share of their livelihoods earned from rural nonfarm employment, both through informal businesses and wage employment. Greater

²⁵ See Sitko and Jayne (2014) for evidence in Zambia, and Schoneveld (2014) for Africa-wide evidence.

nonfarm income-earning opportunities will also provide the capital to enable relatively productive smallholders to break through the barriers of subsistence agriculture into a more commercialized medium-scale stature. As a result, this scenario is likely to produce more equitable patterns of farmland use and more widely dispersed benefits to be derived from a high-food-price environment.

Urban poor: Broadly based growth in urban incomes will reduce the number of urban poor. Recent evidence indicates a long-term inverse correlation between food price levels and overall poverty, resulting from the multiplier effects associated with food production incentives (Headey 2014). Urbanization with income growth will result in more profound shifts in consumer demand patterns than in the latifundia scenario. Under latifundia, demand expansion is driven mainly by population growth, meaning that more of the same commodities are demanded by more poor consumers. Major shifts in consumer preferences for quality, convenience, and sanitary conditions for shopping occur only among a relatively small percentage of consumers who are experiencing significant income growth. In contrast, when urban income growth is broadly based, the composition of demand shifts as per Engel's law in addition to greater demand for the same goods driven by population growth. This growing urban demand will stimulate a greater supply response in local production and private investment in the food system, contributing to efficiency gains and employment generation. Such investments may help local food production keep pace with domestic demand growth and hence mitigate the trend toward increased food import dependence as shown in Figures 3.1 and 3.2. High food prices may also become less politically sensitive with broad-based urban income growth,

thus enabling more of the public budget to be shifted from general consumer food subsidies into other areas with greater payoffs to long-run productivity.

Rural communities/small-scale farmers: Under this scenario we anticipate that a greater number of smallholder farmers will be well positioned to meet the growing urban demand for food through informal markets. Improved market access conditions and increased private investment in food value chains will enable many of these farmers to adopt productive farm technologies, acquire more land, and move away from subsistence farming toward commercialization. Over time, some farm consolidation will occur as nonfarm employment opportunities pull the more marginal farmers out of agriculture and into more remunerative nonfarm jobs.

Agribusiness firms and investors: The interest of foreign investors will remain high, driven by strong demand growth through the food systems. Because income growth reaches further down to the urban poor, African entrepreneurs will be greater incentivized to invest in the informal markets that cater to the shopping habits of the poor, as well as in the more modern aspects of the food system that are preferred by high-income consumers. Broad-based income growth will also raise the incentives for local business investments along the food value chain as the demand rises for all categories of food.

Traditional authorities: The relevance of traditional authorities derives largely from their control over a stock of land to allocate to subjects, and the political power of those subjects in the modern state (Herbst 2000). In some countries, traditional authorities have been stripped of their authority

to allocate land through the conversion of customary land to statutory land. If smallholder farming is viable for many households residing in areas of customary tenure, this may stave off the pace at which customary land is converted to state-titled land. The viability of smallholder farming is most likely to be decisive; if the returns to labor in smallholder agriculture become too low, farming will offer little incentive, which then creates greater political pressure to change the tenure structure to enable others to take control of it. Agricultural policies and public expenditure patterns will largely determine the future returns to labor in smallholder agriculture.

Scenario 3: Slow and Steady Wins the Race

Under the third scenario we assume a broadly based pattern of urban income growth (for example, from investment and employment growth in industry and manufacturing), yet unlike Scenario 2, global food prices remain relatively constant or decline.

Urban consumers: We anticipate that food demand patterns would shift in ways similar to those described for Scenario 2, with similar virtuous cycles and multiplier effects being created between income growth in towns and private incentives to invest at the various downstream stages of the food system. High-income household demand will be increasingly met by imported food as shown in Figure 3.1 because lower food prices may dampen the returns to investment in local production for crops without a clear competitive advantage vis-à-vis the world market. Low-income household demand will be met by local small-scale production and informal value chains, yet the returns to labor for those engaged in those sectors may be quite modest without significant public investment in

support of infrastructure and agriculture (for example, crop research and development, extension systems, soil health programs, subsidization of inputs needed to make inorganic fertilizer more profitable to use).

Rural communities/small-scale farmers: The demand of international and domestic investors for agricultural land is expected to be lower under this scenario as a consequence of the relatively lower returns to agriculture in a low world-food-price environment. Local informal and formal businesses may have less competition from international capital, and the rate of investment and innovation in the food systems may be less dramatic than in Scenario 2 but still be favorable over the long run. These farm households will experience somewhat less competition from foreign investments in land. In other words, their access to land will not be as constrained as under Scenarios 1 and 2.

Foreign investors: The appetite for investment will decline as returns on investments fall. However, Africa will remain an attractive investment relative to the rest of the world owing to the rate of population growth and relatively broadly based income growth.

Traditional authorities: Lower world and domestic food prices are anticipated to reduce the competition for land from foreign investors and relatively wealthy urban people and to slow down the dynamic changes in farm structure described in earlier scenarios. Political pressure will be less intense to convert customary land to state-titled land. Consequently, traditional authorities may retain their influence in rural areas for a longer duration.

Scenario 4: Stagnation

As with Scenario 1 we assume a skewed distribution of growth in urban incomes and a constant or declining trend in global food prices relative to the general price level. While government policy decisions and the composition of its public investments are important in all cases, this scenario in particular may require a progressive and committed “development state” to manage the transformation to a thriving and relatively egalitarian society.

Urban consumers: Under this scenario, the natural resource industries, such as oil and mining, will continue to be the main engines of growth with relatively small growth multipliers emanating from agrifood systems and little potential for employment expansion in urban areas. Unlike Scenarios 1 and 2, the savings of the urban elite will be directed toward either nonagricultural growth sectors, such as mining, or to offshore banking and the like.

Rural communities/small-scale farmers: As in Scenario 1, continued rural population growth and land subdivision will intensify land constraints in the more densely populated smallholder areas, with median farm sizes decreasing over the next 10 years. However, low agricultural prices may depress incentives to invest in sustainable agricultural intensification without major public programs to address soil fertility issues in a holistic manner.

Agribusiness firms and investors: We anticipate a slow rate of foreign direct investment in food systems except perhaps in retailing. The phenomenon observed in Figure 3.1, whereby a high share of consumer food imports comes from international markets, may characterize this scenario as well, owing to the concentration of disposable income among a relatively narrow segment of high-income consumers. Low world and domestic food prices would also reduce the competition for land from foreign investors and relatively wealthy urban people and retard the dynamic changes currently being seen in land markets and farm structure.

Traditional authorities: As in Scenario 3, low food prices would reduce the intensity of the pressure put on the political system to pass sweeping land acts that convert customary land to state-titled land. Traditional authorities would be likely to retain their influence in rural areas for a longer duration.

Conclusions

Africa’s economies are complex and interdependent systems. Like most other economic systems, they develop endogenously with broader demographic and economic changes in the broader economy. Their future trajectories are highly dependent on policy choices and public investment patterns and hence can be molded by public action. Moreover, they evolve through interdependent decisions of many actors such that few emerging patterns can be linked to a particular agent within the system. The variables influencing their development change over time, along with the underlying structure of local, regional, and international economic systems. In this dynamic environment, notions of equilibrium conditions may be less

appropriate than continuous adaptation to disequilibrium caused by rapid technical, institutional, and policy change.

The takeaway messages from this analysis are threefold. First, many megatrends identified as drivers of change in African agricultural systems are arguably highly dependent on other underlying processes that may or may not occur. Our projections for the future are highly contingent on the predicted time paths of numerous variables. Two such variables of central importance in the context of predicting the future of African food systems are the direction of future world food prices and the rate and breadth of income growth in urban areas.

A second conclusion is that the pace and force of some commonly identified megatrends are highly dependent on policy and public investment decisions to be made by African governments. These megatrends are hence malleable over time. We highlight this point as a counterpoint to analyses couched in terms of inevitable transformations. The risk of conceiving of global food systems as irreversible exogenous shocks on developing countries is to neglect the role of proactive public policy to moderate and shape the way international forces affect local agricultural sectors. Therefore, achieving socially equitable outcomes in food systems does not stop at technical solutions for getting the prices right or the markets right (as important as these are), but fundamentally getting the political institutions and political processes right (Rodrik et al. 2004) since these processes determine the policies and, in turn, the market and pricing outcomes. In response to views that the widening social inequality of the United States might be an inevitable outgrowth of capitalist economies, Stiglitz (2014) remarked, “Widening and deepening inequality is not driven by immutable economic laws, but by laws we have written ourselves.” While

the question of how to get the political process right is obviously complex, situation dependent, and beyond the scope of this analysis, major features of such a process are that it is transparent, participatory, and one that can be defended as reflecting the long-term interests of the majority.

Our third conclusion is that some of the most important trends currently shaping African food systems may continue only for a limited duration. This is both because they are part of a system that co-evolves with related processes that may assume new trajectories and because some can be bent by policy. Hence, we believe that foresighting studies might be most useful if they would consider a range of plausible scenarios of the future in order to anticipate the various plausible challenges that African leaders might face. Our analytical framework considers four general scenarios contingent on the direction of global food prices and the pace and breadth of income growth in Africa’s rapidly growing urban areas, given the uncertainties and endogeneity of both of these to other important economic processes. A conclusion that is likely to remain constant no matter which scenario unfolds is that the creation of new jobs in the nonfarm economy will be unlikely to grow fast enough to absorb the rapidly growing young labor force. Because of this, smallholder agriculture will remain a fundamental safety valve for absorbing much of the new labor force into gainful employment (Losch 2012), at least as a several-decades-long intermediate stage in the region’s economic transformation. While only a fraction of smallholder farmers currently possess the requisite entrepreneurial ability and productive assets to thrive, this sector still plays a crucial role in successfully managing the transition to a modernized Africa. It must remain viable at least over the next several decades for two reasons.

First, we must acknowledge that even in 2014, most African countries are primarily inhabited by unskilled and semiskilled²⁶ rural people who are primarily engaged in farming. While most rural people might wish to put down their hoes and walk into white-collar office jobs tomorrow, their levels of education and skills will prevent this from happening quickly. Under such conditions, much greater public investment directed toward making 2-hectare farms productive may have high payoffs. Second, the growth of nonfarm sectors and employment opportunities will rely on effective demand. When a country's population is 60 percent rural, it is difficult to generate effective demand for nonfarm goods and services without at least some portion of the countryside having enough money to participate in the cash economy. The literature on growth linkages indicates that the first-round beneficiaries of agricultural growth generate important multiplier effects by increasing their expenditures on a range of local off-farm and nonfarm activities that create second-round benefits for a wide range of other households in the rural economy (Johnston and Mellor 1961; Mellor 1976). The extent and magnitude of these second-round effects depend on how broadly spread the first-round growth is. The distribution of land and other productive assets will clearly affect the size of these multipliers. If dynamic labor and services markets can be developed, then other employment opportunities should be easier to create in the very locations where the larger smallholders are investing and raising their output and productivity. Proactive public-sector investment and policy support in developing these labor and service markets will be a key determinant of the magnitude of the growth linkages to be derived from agricultural growth. Education, which played a crucial role in Asia by allowing households to

exit agriculture into more lucrative off-farm jobs, is relatively low in most areas of rural Africa by world standards. Investments in rural education and communications are likely to become increasingly important to facilitate structural transformation under any of the future scenarios envisioned.

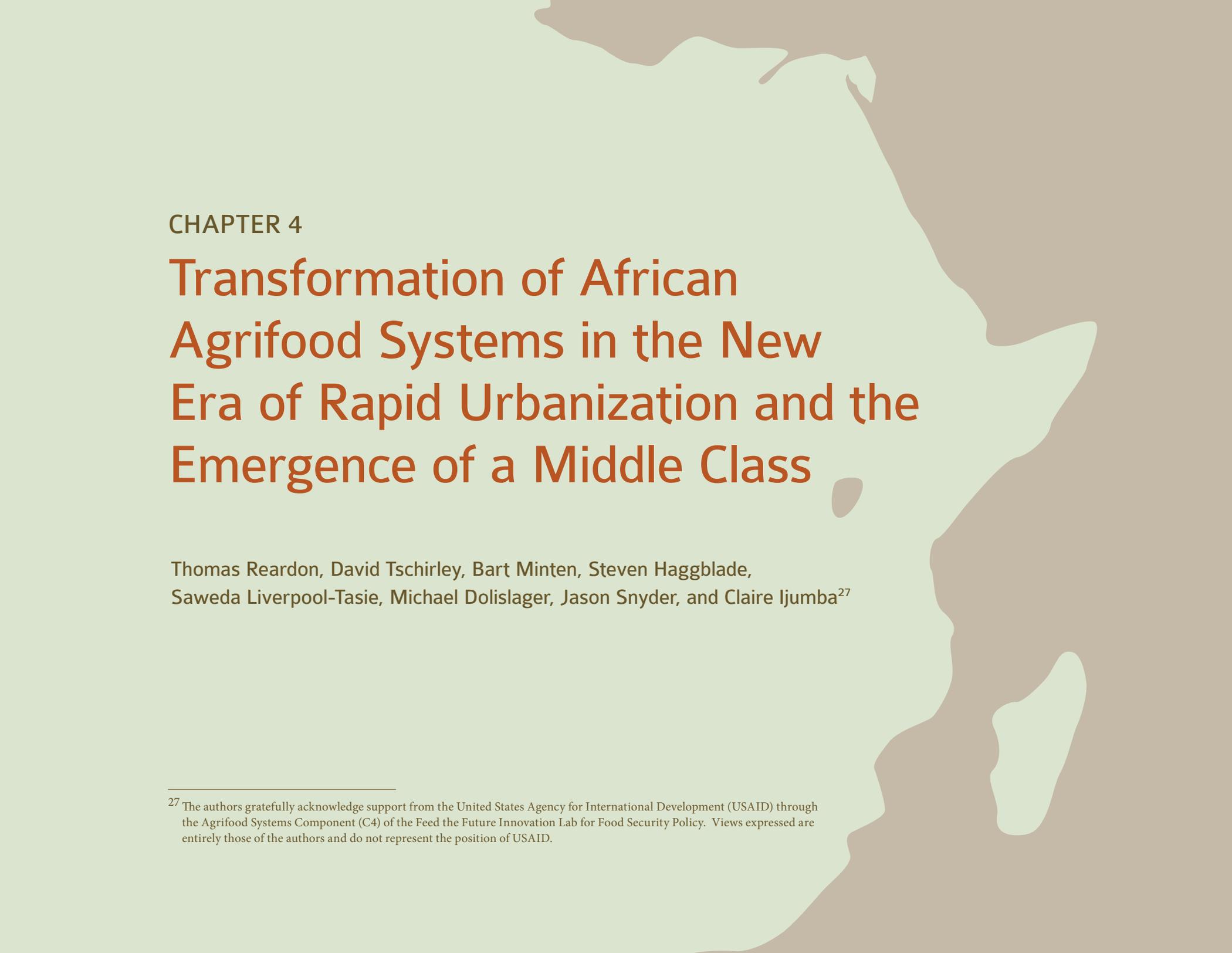
So, what should governments do? While Dercon and Gollin (2014) rightly warn that the empirical evidence is often not strong enough to warrant confident prescriptions, governments cannot wait for academics to conclusively agree on the priority list. Governments are acting today, and to be useful, academics must provide guidance based on the weight of the evidence. To these authors, the priority list would look something as follows. First, invest strongly in the education value chain—from higher universities to vocational schools to primary and secondary education—to upgrade the skill levels of young people entering the labor force. Second, implement policies to promote broad-based agricultural growth, including investments in research and development that are scale-neutral, agricultural extension programs, and programs designed to restore long-term soil fertility. Third, invest in physical infrastructure (roads, ports, and electrification) to reduce the costs of production in both industry and agriculture and thereby promote competitiveness and job creation. Fourth, institute an industrial policy that promotes private investment and job growth in local nonfarm sectors, which simultaneously acts as a stimulus to investment in local agrifood systems (see EIU 2008; Hausmann et al. 2008; Rodrik 2007). In particular, strategic industrial policies that aim to reduce the cost of doing business (for example, energy policies that focuses on 21st century technologies, which provide low-cost and reliable energy supplies) and improve competitiveness of local industry

²⁶ At least with respect to the types of job skills being demanded in the modern and globalized economy.

(for example, remove or reduce trade restrictions and taxes on imports of inputs to industry and service sectors, that is, trucks, tractors, spare parts, etc. as well as minimize border-crossing bottlenecks). Furthermore, in terms of scope, industrial policy interventions should ensure that incentives and/or public goods aimed at improving the function of markets are equally available to both the formal and informal sectors. As most of the job growth in Africa over the next decade will be both in farming and nonfarm microbusinesses, industrial policies that provide a favorable and level playing field for both of these sectors would promote competition and growth. Fifth, invest in urban planning (housing, sanitation, health facilities, and green spaces) in anticipation of the near certainty that

an increasing proportion of Africa's population will be living in urban areas in the decades to come. A possible sixth priority area would be for governments to mobilize adequate funding to finance these investments and leverage complementary private-sector investments.

These challenges are formidable but manageable. While private investment will largely determine the quality and pace of job creation in the region, the enabling environment and the underlying political process determine the quality and pace of private investment. Hence the role of governance and institutions is decisive and will largely determine whether the region's economic transformation is a relatively smooth, robust, and peaceful process or a painful and protracted one.



CHAPTER 4

Transformation of African Agrifood Systems in the New Era of Rapid Urbanization and the Emergence of a Middle Class

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Introduction

For decades, it has been common knowledge that rural Africa faces formidable problems of poverty and malnutrition; inadequate farm yields; low use of fertilizers, certified seed, and irrigation; and poor infrastructure. While this paper acknowledges these problems, it also presents the good news about African food systems. A “Quiet Revolution” has emerged in African food supply chains, led mainly by African entrepreneurs in tens of thousands of small enterprises, and scores and perhaps soon hundreds of medium- and large-scale firms, such as Bakhresa grain millers in Tanzania, Shoprite and Uchumi supermarket chains in South Africa and Kenya, and Zartech chicken processors in Nigeria. All along the supply chain, firms are emerging and developing in the new era of urbanization and the creation of a middle class.

Over the past four decades, African food markets have expanded as much as eight-fold and have generated a systemic transformation. With most of that growth occurring in the past two decades, Haggblade (2011) projects that the African food market will grow another six-fold in the next four decades, or more than a dozen-fold in a human lifespan—a monumental achievement. Africa’s urban areas have grown quickly, and now constitute half or more of overall food consumption. Food consumption itself is changing rapidly, with a shift beyond grains into nongrain foods, such as dairy, fish, meat, vegetables, fruit, and tubers, and heavily into processed foods. A substantial middle class has emerged, and is an important driver of food system change, but is not the only driver of change, as the poor’s food consumption patterns have also changed significantly.

A central implication of this paper is the need for good public policy and substantial investments to leverage urbanization and dietary

diversification to develop food supply chains to feed millions in growing cities and rural households, and to increase the incomes of poor rural households who produce food and are employed in food supply chain activities. Rural suppliers need to sell to sources of dynamic, growing, especially to domestic urban markets. Typically, rural purchasing power is too limited to propel a rural area out of poverty, characterized by rural suppliers just producing for themselves and their local market alone. At present and into the future, while export markets are attractive, domestic urban markets are quantitatively far more important and will be increasingly so.

Food supply chains are two-way superhighways, bringing food and fiber one way, and an avalanche of money the other way, back to the producers at every step in the chain—to the farmers, truckers and wholesalers, warehouse and cold-store operators, and processors. This avalanche of income fuels—and will fuel far more with time—grass-roots investments (much of it in rural areas or towns) by many small- and medium-scale farmers in the midstream and downstream segments of the rural–urban supply chains (such as investments in trucks), in farming (such as investment in pumps), and in the input supply chains (such as investments in improved seed varieties). Rural households are also using this income to invest in education, housing, and rural nonfarm enterprises. This investment can lead to rural growth that extends to the poorest of those in the dynamic areas and also over time to the hinterlands. African policymakers have a major new opportunity in leveraging and encouraging this enormous development.

This paper first looks “downstream” at two processes—urbanization and dietary changes—that create the demand (“pull”) for the changes in the whole food system. It then provides some illustrations of the

transformation, mainly at the “midstream,” post-farmgate segments of the supply chains that are transforming—wholesale, processing, and logistics. It concludes with the implications of this transformation.

The Rapid Rise and Size Differentiation of the Urban Food Market in Africa

Four salient points characterize the transformation of African agrifood systems: (1) Africa is urbanizing rapidly, (2) urban shares of food consumption and food markets are higher than the shares of urban populations, (3) urbanization in Africa is less concentrated than generally believed, and (4) growth in the African middle class has surged.

Africa Is Urbanizing Rapidly

Urbanization in Africa has caught up with the average urban share in population of all developing countries. East Africa’s urban share in 2010 was only 23 percent, versus 44 percent in West Africa and 59 percent in Southern Africa (UN 2011), and West Africa’s share is roughly 50 percent (up from 33 percent in 1990) (Hollinger and Staatz (2015).

While all of Africa, except for East Africa, has caught up with or passed overall developing country urbanization, even compared with Southeast Asia, the urbanization rate is much higher than the rate of other regions of the world. By 2010, the annualized growth rate of urbanization during 2005–2010 was 4.1 percent in East Africa, 3.7 percent in Central Africa, and 3.8 percent in West Africa. The only subdued pace occurred in Southern Africa, where urbanization is already advanced and only growing at 1.3 percent. The United Nations expects this urbanization will continue

through 2050, with urban population growth projected at 3.7 percent per year compared with only 0.5 percent in rural areas (UN/DESA 2011). Already by 2020, the urbanization level will be 50 percent, and 65 percent by 2050 (UNFPA 2010). While variation over countries is significant, the example of Nigeria underscores the rapidity of urbanization, rising from 35 percent in 1990 to 71 percent in 2050. Urbanization in West Africa as a whole rose from 33 in 1990 to 66 percent in 2050 (UN/DESA 2011). This leap in urban share in a half century can be compared with the growth in U.S. urbanization in one century.

Urban Shares of Food Consumption and Food Markets Are Higher Than the Shares of Urban Populations

The shares of cities in a country’s total food consumption and the food (purchased) market are higher than urban population shares per se. This is because urban consumers spend a lower share of their total household budget on food compared with rural populations, but their incomes are sufficiently higher, so that their per capita food expenditure is higher. The upshot is that urban food markets have become the dominant market for farmers in all these regions, and are at least as important as rural markets and are much more important than export markets in quantitative terms.

Specifically, in the least urbanized part of Africa—the developing Eastern and Southern Africa (ESA) region—25 percent of the ESA population lives in urban areas, but 48 percent of the (purchased) food market is in cities (that is, the urban population consumes 48 percent of the total food produced and sold in the region) (Dolislager, Tschirley, and Reardon 2015). The West African picture is even more striking in this disproportion of

the urban share in population versus its share in the total food economy—and similar to that of Southeast Asia. Hollinger and Staatz (2015) cite Taondyandé's and Yade's (2012) 2006–2009 budget-consumption studies of seven countries (Burkina Faso, Côte d'Ivoire, Ghana, Mali, Niger, Senegal, and Togo). They found that the average total expenditures per capita in urban areas ranged from 78 percent higher than those in rural areas in Burkina Faso, to 148 percent higher in Mali. A rough extrapolation from these data suggest that in West Africa, the urban population share is half of the region's population, while the urban share of the food economy is at least two-thirds and is probably closer to three-quarters.

Urbanization in Africa Is Less Concentrated Than Generally Believed

While the urbanization debate tends to focus on megacities (of more than 1 million people), a large share of the urban population resides in smaller (intermediate) cities and towns, so that urbanization is less concentrated than usually thought. Tschirley, Haggblade, and Reardon (2013) point to two sets of trends that are occurring in parallel in Africa.

On the one hand, large cities are proliferating: the number of cities with more than a million inhabitants in Africa rose from 2 in 1950 to 50 in 2010 and is projected to rise to 93 by 2025.

On the other hand, small and medium-sized cities are growing faster than large cities. Tschirley, Haggblade, and Reardon (2013) used population data to show that more than African countries as a whole, the population concentration (Herfindahl) index indicates a strong negative trend over time. Moreover, they illustrate that the indices of concentration show strong

convergence over time, with the countries with the highest indices (i.e., the most centralized urban populations) having their population concentrations declining the most (becoming markedly less centralized in their urban settlement pattern), while those with the lowest starting indices remain nearly flat.

For West Africa, Hollinger and Staatz (2015) note that 40 percent of the urban population resides in rapidly growing national metropolitan areas (the areas of the large cities), with much of this growth occurring in the large coastal cities. The other 60 percent of urban population lives in secondary and tertiary cities, including small towns in rural areas, and small and medium cities growing up near large cities and along highways.

The rise of small and medium cities is a positive trend for food system development and rural growth from several viewpoints.

On the one hand, Christiaensen and Todo (2013) find that countries with a lower level of urban concentration show more inclusive growth patterns and faster poverty reduction than those characterized by the dominance of one or a few very large cities. Interventions in the public market and road infrastructure of small and medium cities offer major opportunities to develop inclusive horticulture supply chains into these cities.

On the other hand, small and medium cities establish a far closer relationship with their surrounding rural areas in terms of food provisioning, compared with large cities and metropolitan agglomerations, which depend on food coming from all over the country and abroad, and have a lower reliance on their own rural belts (Berdegúe and Proctor 2014). Rural nonfarm employment (often linked to off-farm components of the agrifood supply chain) develops close to cities and in the presence of adequate infrastructure.

Growth in the African Middle Class Has Surged

There has been a steep surge in the growth of the African middle class, especially in the 2000s. Ncube, Lufumpa, and Kayizzi-Mugerwa (2011) used a cutoff of US\$2/day/capita in 2005 purchasing power parity for the middle class, with \$2–\$4 for the “floating middle class” (near the poverty line, with the chance of slipping below), \$4–\$10 for the lower middle class, \$10–\$20 for the upper middle class, and above \$20 for the high-income class. They found that the share of Africa south of the Sahara’s (SSAs) population in the middle class (\$2–\$20) rose from 24 percent in 1990 to 33 percent in 2008. As the SSA population was 495 million in 1990 and 822 million in 2010, this means roughly an expansion of the middle class from 119 million to 271 million people—more than doubling in just two decades.

However, the great majority of this expansion was in the floating middle class. Ncube, Lufumpa, and Kayizzi-Mugerwa (2011) showed this for SSA, but it is indicative nevertheless. For Africa overall, for 1990 and 2010, respectively, the middle class population jumped from 31 percent to 39 percent (thus showing Northern Africa has a higher internal share of middle class), the floating middle class rose from 13 percent to 21 percent, the lower middle class dropped from 14 to 13 percent, and the upper middle class grew from 4 percent to 5 percent. For example, Ncube, Lufumpa, and Kayizzi-Mugerwa (2011) showed the overall middle class share of the population in West Africa was 24 percent, of which 58 percent was in the floating middle class (a bit higher than the all-Africa share).

Notably, while the rise of the middle class is not confined to the urban areas, it occurs disproportionately (compared with population) in the urban areas. That the middle class is not only in the urban areas is good news

for demand growth in food systems. The evidence of this trend is new and comes so far only from ESA. Tschirley, Haggblade, and Reardon (2013) used the World Bank’s PovcalNet database for three food staple zones that capture 81 percent of the population of developing ESA (excludes South Africa). They found that (1) the urban population share in this area is 22 percent; and (2) 50 percent of the urban population is poor (earning less than \$2/day), while 80 percent of the rural population is poor.

The Multidimensional Transformation of African Diets

Dietary Transformation

African diets have been changing in a variety of ways. This section briefly discusses the drivers of change, and then examines the changes, which have been driven by several factors on the demand and supply sides.

On the demand side, despite the persistence of severe poverty in the region, average incomes have risen and a middle class has emerged. These changes have spurred the purchase of diverse foods beyond grains, as predicted by Bennett’s Law (Bennett 1954), which shows the relationship between increasing incomes and a disproportionate rise in the share of non-staple foods in the overall food budget of a household. Moreover, urbanization is associated with changes in the employment profiles of both women and men. Women are increasingly working outside the home, and thus have less time to shop for, process, and prepare food; men are increasingly working far from home, across cities. These trends are driving

the purchase of easy-to-process cereals, such as rice and wheat (Reardon 1993; Senauer, Sahn, and Alderman 1986), along with processed foods and restaurant-prepared foods, as discussed in more detail below.

On the supply side, mirroring the demand side, the food-processing sector has increased significantly over the past several decades, and a restaurant/fast-food segment has emerged. Also mirroring the demand side, agriculture has diversified substantially beyond grains and basic food tubers and roots into horticulture, dairy, livestock, fish, and pulses. Finally, the development of rural nonfarm employment and the gradual commercialization of agriculture in certain areas have furnished cash incomes used in part to buy processed foods and restaurant-prepared food.

These changes, in turn, have led to a series of changes in food consumption, including dietary commercialization, dietary diversification into processed food and beyond grains, and dietary changes within subsegments of the poor.

Dietary commercialization—Africa has experienced a partial “dietary commercialization,” with the diet transitioning to some extent from (traditionally) mainly home-produced food to purchased food, even among the rural poor. The literature notes that there are many net buyers of food in rural areas, not just among the landless, but also among small farmers (Weber et al. 1988; Reardon, Matlon, and Delgado 1988). This point has been made over time in waves of the debate in Africa (e.g., Barrett 2008). Recent work by Palacios-López, Christiaensen, and Galindo Pardo (2015), using Living Standards Measurement Study-Integrated Surveys on

Agriculture (LSMS-ISA) surveys from five countries, has found that between 56 percent (Malawi) and 35 percent (Niger) of all rural households are net food buyers (or between 62 percent and 34 percent of all households in Malawi and Niger, respectively). Adjusting the estimates for the timing of the surveys in Malawi and Tanzania, which were conducted throughout the year, raises the estimated share of net food buyers to 83 percent and 72 percent, respectively.

Recent evidence shows how far the involvement of farm households has extended in terms of reliance on purchases for food consumption. This implies that the transformation and efficiency of the food value chain can be important to the rural poor, not just as farmers and labor sellers, but also as consumers and buyers. Beyond the frequency of net buyers, the recent literature also confirms the importance of these purchases to overall food expenditure. Table 4.1 shows that in the ESA countries in 2010, rural households overall—and the poor in particular—bought a substantial share of their total food expenditure, with 95 percent of the rural poor buying at least 5 percent of their food. The rural purchased food market is actually larger (in total volume) than the urban market (although the share of purchases in urban food is, of course, higher) (Dolislager, Tschirley, and Reardon 2015).²⁸

Dietary diversification into processed food—Dietary diversification into low-processed and high-processed food has been substantial, as has penetration primarily in urban but also in rural Africa. Even the rural poor are buying some processed foods.²⁹ For example, as shown in Table 4.1, in

²⁸ The Dolislager, Tschirley, and Reardon (2015) estimate is based on circa 2010 data from Living Standards Measurement Studies survey data in ESA (i.e., Ethiopia, Malawi, Mozambique, Tanzania, and Uganda).

²⁹ Dolislager, Tschirley, and Reardon (2015) define processed food as any food that undergoes any transformation from its original state beyond removal from the plant and (for nonperishables) drying. The processed food item is defined as low processed if it satisfies fewer than two (and high processed if satisfies two or more) of the following conditions: (1) has multiple ingredients (and is automatically high processed if one of ingredients is highly processed); (2) had physical change induced by heating, freezing, extrusion, or chemical processes (i.e., more than simple physical transformation, such as cutting, sifting, sorting, removing from pod); and (3) has packaging more complex than simple paper or plastic.

the ESA study countries (Dolislager, Tschirley, and Reardon 2015), households in urban and rural areas dedicate a significant share of their total food expenditure to both low- and high-processed foods. The rural poor (close to overall poor, because 80 percent of the rural households are poor) spend 29 percent of their food expenditure on processed food (17 percent of processed food is in purchased milled grains classified as low-processed

items, 48 percent is in nongrain low-processed foods, and 35 percent is in high-processed food).

Dietary diversification beyond grains—Dietary diversification beyond grains has been significant, with only moderate differences between urban and rural populations, and between the rural poor and the rest of the population. As one would predict from Bennett’s Law, the general trend is a disproportionate growth in the food expenditure share of nonstaples as incomes grow. Studies show that this dietary diversification trend is more advanced in urban areas because of income differences. For example, in ESA, daily per capita total food plus nonfarm expenditure is \$1.59 for rural and \$3.07 for urban households (Dolislager, Tschirley, and Reardon 2015). In the ESA study countries, the share of nongrains in the total food expenditure is substantial, as shown in Table 4.1.

Of course Africa is no newcomer to dietary diversification. Maize, cassava, yams, potatoes, bananas, tomatoes, and chilies are all non-African in origin, are nontraditional, and have been brought relatively recently to Africa from South America and Asia; only teff, millet, sorghum, watermelons, okra, and palm oil are major “originally African” items. But the new wave in the past several decades of diversification is a major thrust beyond grains as incomes grow—into yams and potatoes; fruits and vegetables; poultry, beef, mutton, and fish; dairy and eggs; and edible oils.

This dietary diversification means new and more sources of caloric energy, but also micronutrients. On the supply side, it means major potential income gains for farmers, as producing and selling meat, dairy, or fruit to towns and cities earns a farmer 5 to 10 times more per hectare than grains. This is a major source of income for rural development.

TABLE 4.1—CHANGES IN CONSUMPTION PATTERNS IN EASTERN AND SOUTHERN AFRICA

Consumption pattern	Percent
<i>Share of total food expenditures from purchases for rural households</i>	
Overall rural	44
Rural poor (up to \$2/day per capita)	41
<i>Share of total food expenditures in nongrains</i>	
Urban households	—
Rural households	—
<i>Share of total food expenditures in processed foods</i>	
Urban households, overall processed	56
• low-processed foods	58
• high-processed foods	42
Rural households, overall processed foods	29
• low-processed milled grain	17
• low-processed nongrain	48
• high-processed foods	35
<i>Share of nongrain expenditure versus total expenditure</i>	
Urban households	66
Rural households	61
Source: Dolislager, Tschirley, and Reardon (2015); country coverage and definitions are noted in the text.	

Dietary changes within subsegments of the poor—While the conventional image is that sharp change in diets mainly occurs when families “graduate” to the middle class, in fact the data show that much of the dietary change occurs over subsegments of the poor, not mainly between the poor and the nonpoor. The diets of the poor are dynamic, as shown in ESA by Dolislager, Tschirley, and Reardon (2015).

Imported versus Domestic Content of the Diet

Despite the above changes, diets remain basically local, with only a minority of food imported. Although macro data on food imports and production are very probably quite rough, this paper used the data that are available to estimate the share of imports in total consumption. FAOSTAT food balance sheets and COMTRADE for Africa were used to calculate average figures over 10 years. The data revealed that 80–90 percent of urban and rural food consumption has been supplied by domestic supply chains from domestic producers; only 10–20 percent is imported (although, of course, that varies by product). Averages around 2010 (2008–2012) and 2000 (1998–2002) show ESA going from a share of 11 percent of imports in total food consumption in 2000 to 15 percent in 2010; for West Africa, the shift was from 10 to 11 percent.

Moreover, Tschirley et al. (2015) show that as incomes rise, the import share actually declines, as imports are mainly in rice and wheat and the share of these foods in consumption declines with income and the shares of products that have low import shares increase.

Recognizing that the great majority of food comes from domestic supply does not mean that competitiveness with imports is not a valid policy issue. Food imports are often an important policy debate in Africa, particularly in West Africa, as concern about imports has grown over

time, especially imports of rice (Reardon 1993; Demont 2013). Most of the imported foods (with the exception of wheat) are also grown in West Africa, and their imports means that there are opportunities for local producers to meet that demand. For example, in West Africa in 2006–2010, cereals were the leading item in food imports (41 percent), followed by vegetable oils (13 percent, up from 4 percent a decade earlier), fish (11 percent), dairy products (9 percent), and sugar (9 percent) (Hollinger and Staatz 2015).

Emergence of a Quiet Revolution in the Midstream Segments of the Food Supply Chains in Africa

The post-farmgate segments of the supply chain—the midstream (processing and wholesale/transport) and downstream (retail and food stalls) segments—together comprise 40–70 percent of food costs to urban Africans. (The share depends on the product and country.) That means that these segments are as important as farmers for national food security.

A common view of African food markets appears to be that they are largely still only “traditional” and stagnant, suspended in a past when food products moved laboriously to market via fragmented, undercapitalized, undynamic market actors. Two observations undermine this view of African food supply chains as “sleepy” and resisting transformation.

First, African food supply chains have massively increased their volumes over the past 40 years. A rough, but indicative, estimation shows that in 2010, (1) the rural–urban food supply chains moved about five times more food to cities than they did in 1970; (2) the rural market volume of purchases of food expanded eight times over the period; and (3) overall, African marketed food volumes expanded six times over 40 years, with

much of the crescendo occurring in the 1990s and 2000s. Note that this estimate is based on developing ESA—the poorest and least urbanized region in Africa. West Africa’s urban growth was 50 percent more than ESA’s, so the overall food market volume may have expanded eight times there. Needless to say, achieving a six- to eight-fold expansion is not the work of a sleepy or stagnant market system.

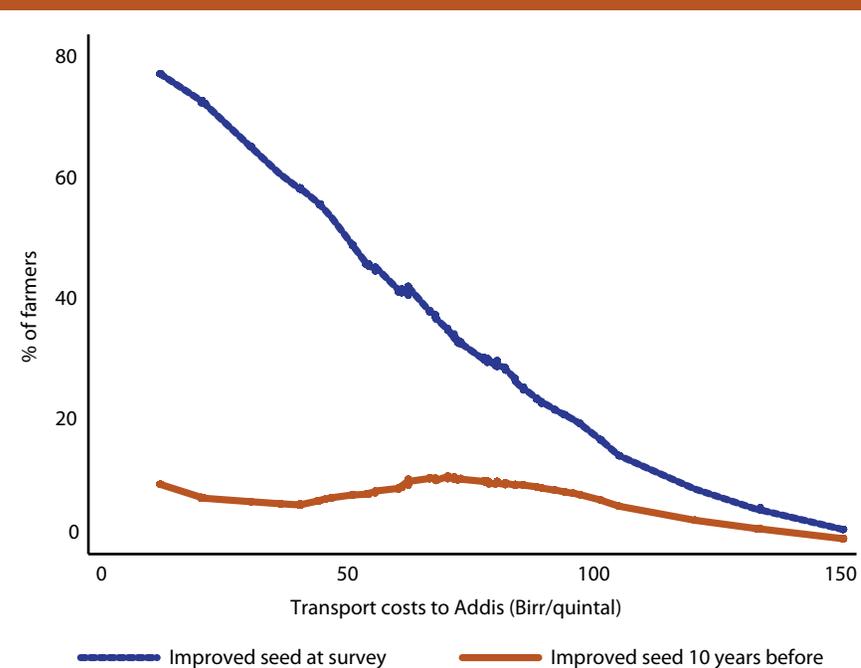
Second, numerous case studies show that—seemingly largely “under the radar” of the development debates—a “Quiet Revolution” is emerging in supply chains, with tens of thousands of small and medium-sized enterprises (SMEs) in trucking, wholesale, warehousing, cold storage, first- and second-stage processing, local fast food, and retail making major investments in recent years. It is surprising to see how similar this is—and not yet central in the national debates—to what Reardon et al. (2012) recently observed in Asia, often occurring just in the past decade. Asia’s supply chain transformation has been somewhat ahead of Africa’s transformation, but has been going in the same direction of grass-roots revolution in supply chains. The following examples of this change in Africa are meant to be indicative, rather than an exhaustive review, of evidence. Research on this phenomenon is in the early stage.

Rapid Development of the Teff Value Chain to Addis Ababa, Ethiopia

Teff is the leading cereal in Ethiopia. The marketed surplus of teff to domestic markets is \$464 million, near that of coffee (\$600 million), a major Ethiopian export. An explosion of growth in the teff value chain to Addis Ababa has occurred in the past decade, based on field surveys of farmers, rural and urban wholesalers, and truckers midstream, and of cereal retail shops, mills, and co-op retailers downstream (Minten et al. 2013). Addis

has experienced a proliferation of SME mills-cum-retailers and rapid transformation all along the supply chain. The recent development of the teff value chain was found to be driven overall by significant growth in Addis and increase in incomes (with a doubling of income and a doubling of teff expenditure in the past 10 years); by the increased opportunity cost of women’s time (saving time cleaning and milling teff and making enjera [teff pancake]); and by the diffusion of cell phones, improvements in roads and reduction of transport costs (Figure 4.1), and provision of teff government extension services.

FIGURE 4.1—REDUCTIONS IN TRANSPORTATION COSTS TO ADDIS ABABA



Source: Minten et al (2013).

The development of the teff value chain was in turn correlated with (1) increasing adoption of modern inputs (chemical fertilizers, improved varieties of seed (see figure 4.1 as an example), and herbicides) by farmers, especially by those living close to urban centers; (2) rising quality demands and important shifts from the cheap red varieties to the more expensive white teff varieties, with concomitant increases in productivity due to the uptake of improved varieties; (3) increasing consumer willingness to pay for convenience in urban areas, with the rapid emergence of one-stop retail shops that provide sales, cleaning, milling, and transport services, as well as a sizable food service industry; and (4) declining share of the margins of rural–urban marketing, urban distribution, and milling in the final retail prices of teff, indicating improved marketing efficiency over time. Traditionally, and still in rural areas and small cities and towns outside Addis, consumers buy teff as a grain, clean it at home, have it custom milled, and then prepare enjera at home. These practices have changed in Addis over the past decade, with a decline in custom milling and in cleaning grain at home. Instead, consumers are buying teff flour or enjera, driving a sharp increase (nearly 50 percent) of teff mills and retail outlets in the neighborhoods.

Moreover, the wholesale marketing of teff has surged. This segment is seldom studied, as attention is usually paid only to the farm segment. Minten, Tamiru, and Stifel (2014) show that cereal wholesale market activity—including teff and other cereals, such as maize and sorghum—has been developing quickly recently. Focus group participants in a wholesale market survey in Ethiopia were asked about levels and trends concerning the numbers of traders and brokers in the markets, and cereal trucks arriving in these markets. The reported numbers confirm that the marketed

surplus of teff has increased rapidly over the last decade. For example, significantly more trade is reported on average in these markets over time. The reported number of trucks increased over the 10 years by almost 70 percent and 80 percent in the peak and lean periods, respectively. These growth rates are faster than the urban population growth rates in Ethiopia, possibly indicating higher consumption levels in the cities over time, more trade between rural areas that might pass through these urban wholesale markets, and shifts from other means of transportation to trucks.

Maize Processing, Wholesaling, and Retailing in Urban Tanzania

Snyder et al. (2015) present field survey findings for the rapidly expanding and transforming processed maize sector in the capital of Tanzania, Dar es Salaam. In their initial inventory of processed foods on sale in shops, they found a great proliferation of processed food—487 different items in the inventoried categories of processed maize and other flours, packaged rice, dairy products (excluding cheeses, butter, and whipped cream), juices, and poultry. Contrary to a common view they observed, they found that the majority (62 percent) of these items came from Tanzanian firms; imports from neighbors in East Africa, Kenya, and Uganda, accounted for 10 percent of the items; South Africa accounted for another 8 percent; and the other 20 percent of the items came from outside Africa.

Branding in Dar es Salaam has expanded dramatically in recent years. In just the initial inventory, Snyder et al. (2015) found more than 60 brands of Tanzanian maize meal. Branded maize meal now appears to dominate the market in all types of retail outlets, from sokos to the now rapidly spreading supermarket chains. There was also rapid product differentiation

in flours: 50 different blended flour products were found, and all were from Tanzanian firms. These products contain two to eight types of milled grain and pulses, and sometimes dried ground fish or dried vegetable powder. These foods are considered “protein-rich nutrition products” targeted at children in the local market.

Dar es Salaam has also recently seen a proliferation of types of retail outlets (Snyder et al. 2015). There are three regional or international supermarket chains (Nakumatt and Uchumi, based in Kenya, and GAME/Massmart, based in South Africa but now owned by Walmart); at least seven local supermarket chains (Imalaseko, TSN, Village, Shoppers, A to Z, Food Lovers, and Shrijee’s); and many small-format supermarket independents. Also, an unknown but rapidly growing number of “new-format retail clusters” feature parking areas and usually four to five shops that cover the range of food and other needs of most consumers, typically including a duka, sometimes a small-format supermarket, a fresh produce shop, and a butchery. All these new outlet types, spreading rapidly, compete with traditional shops (the dukas and sokos) and appear to be taking market share from them.

Chicken–Maize Nexus in Nigeria

There has been a rapid transformation of the chicken supply chain into urban Nigeria with the rise of companies like Chi Farms, Animal Care, and Zartech, who in turn link to small producers of chickens, to maize mills, and to maize farmers. The following information is based on a rapid reconnaissance study by Liverpool-Tasie et al. (2015).

Over the past decade, the Nigerian poultry industry has seen rapid growth. Despite the smuggling of frozen chicken into Nigeria and other

challenges (high and fluctuating prices of maize and soybean, veterinary supplies, and high energy costs), the Nigerian poultry industry is expected to have a stunning projected 20 percent annual growth between 2010 and 2020, driven by the growth of the population and the middle class (Sahel Capital Limited 2015).

While most poultry production occurs in “backyard production” or on farms with fewer than 1,000 birds, a number of large commercial players (e.g., Zartech Agri Ltd, Ajanla Farms, Obasanjo Farms, Animal Care, Amo Byng Nig Ltd.) have expanded significantly over the past 10–15 years. Though initially partly integrated, many large producers have moved toward almost fully integrated farming operations, while many medium-scale producers tend to be partly integrated (both producing birds and buying them from others). Most small- and medium-scale poultry producers engage in diverse arrangements to secure necessary inputs and to market their products. For large producers, operating an integrated operation often implies the existence of a separate but affiliated sister company that produces the inputs, especially feed. For the small- and medium-scale poultry producers, there has been a recent and rapid proliferation of feed mills offering services ranging from selling already-milled poultry feed to providing a wide range of feed ingredients, along with milling services to “custom mill” (upon request) to meet customers’ specific needs.

While most poultry production in Nigeria takes place in southwestern Nigeria, most of the maize for poultry feed comes from the northern and north central parts of the country. The risky nature of maize access and distribution (due to price fluctuations and activities of Boko Haram), along with the increased demand for maize products, has given rise to multiple organizational arrangements among maize traders, maize farmers, and feed

mills. The traditional approach is where traders and aggregators purchase maize directly from farmers and farmer groups (at harvest when prices are low), then store it in warehouses, and sell it when prices are higher. However, with the rapid rise of the mill and poultry segments, multiple arrangements are developing in key maize-producing states, such as Kaduna, Kano, and Katsina. For example, arrangements are emerging where aggregators and processors provide farmers and farmer groups with training on best practices (and sometimes inputs), in return for an agreed-upon percentage of their harvest or an agreed-upon quantity of maize. Aggregators also are starting to lease land from farmers for their own production of maize to supply mills.

Processed/Prepared Millet Value Chains to Dakar in Senegal

In the past five years, the millet supply chain has rapidly transformed, particularly with the emergence of processed and prepared millet products, mainly for the urban market. As revealed in a rapid reconnaissance study by Badiane (2015), this transformation has featured the development by small female-headed enterprises of branded packaged millet and millet-cum-dairy products for the Dakar market. These products are actually traditional millet-based meals (such as thiakry) that have been packaged in dry, ready-to-cook form or with milk, and sold in a wide range of types of outlets, including convenience stores at gasoline stations, supermarkets, small traditional shops, and traditional markets. Some of these products have even been exported, such as to France and the United States. This emerging sector is employing large numbers of women, who are milling the grain in small mills, and preparing, packaging, and selling the products to wholesalers and retailers.

Conclusions and Implications

The food security debate has often focused on farms and rural areas. The new reality, particularly in the past decade or so, is that post-farmgate segments of food supply chains and urban markets are becoming as important to African food security as the farm segment itself. Equally important is the dynamic growth and transformation of these supply chains, hitherto conceived as being stagnant and traditional. With only a half-decade lag, rural–urban supply chains in Africa are emerging and undergoing the same transformation processes that have taken place in Asia. This Quiet Revolution in food supply chains has featured investment by the private sector—the SME private sector in particular, along with substantial investment by larger African and foreign firms—in retail, wholesale, first- and second-stage processing, packaging, branding, and logistics.

Much of this investment has been in the midstream of the value chains—what Reardon (2015) has termed the “hidden middle,” because it has been relatively neglected in policy debates. These rapidly emerging agrifood SMEs are often neglected in the African food debate because of a lack of awareness of this new phenomenon. Researchers and policymakers have long considered them to be a negligible group—too small a force to count. This perception has been accompanied by laments from governments and donors of the lack of African grass-roots investments. This widespread view was largely responsible for turning attention to seeking investment from either parastatals or multinationals, rather than from grass-roots local firms.

But, as illustrated in the cases above, there is a surge in African grass-roots agribusiness and food industry companies investing in wholesale, trucking, processing, and storage. As in Asia, in the medium to long run these companies are expected to form the backbone of the Quiet Revolution

in food systems in Africa. A number of the emerging and already established small and medium food firms will also evolve into Africa's "lions" in the global food arena—large regional private companies that will eventually become important globally and critical to African competitiveness.

However, in the words of Ousmane Badiane (2015), these rapidly emerging supply chain actors are only "flying at 20 percent of their potential altitude." They urgently need major attention to address hard and soft infrastructural needs, such as expanding rural wholesale markets, developing industrial-strength electricity grids, surfacing roads, and instituting regulation and policy reforms to improve their "business climate."

The doors to the urban markets that these developing supply chains open will be crucial for farmers. Where farmers are linked to growing urban and regional markets (such as teff in Ethiopia, vegetables in Mali and Senegal, potatoes in Rwanda, and dairy in Kenya), they are making investments in soil conservation, building organic matter in their soils, using productivity-enhancing seeds and breeds and fertilizer, and even investing in irrigation and sometimes machines. Farmers growing for subsistence or for just local rural markets often have much less capacity to make these investments (Reardon, Crawford, and Kelly 1995; Minten et al. 2013).

But the development of food supply chains is important to rural households in another way: the large numbers of rural buyers of food depend on the efficiency and development of the food market for food security. Moreover, the rural parts of the developing food supply chains form the backbone of rural nonfarm employment, which comprises 35–40 percent of rural household incomes in Africa (Haggblade, Hazell, and Reardon 2010). In turn, rural nonfarm employment and income from marketed crops are the main sources of cash for African farmers to make productivity investments (Davis et al. 2009; Reardon and Mercado-Peters 1993).

Finally, the diversification of urban food markets beyond grains presents an opportunity for farmers to increase their incomes. For this opportunity to be realized, substantial public and private investment is needed in transportation, logistics, packaging, storage, cooling, and processing, as well as in wholesale markets in large, medium, and small cities and towns.

Of course, these transformations and developments are very uneven, over countries, over zones of dynamic areas near towns and cities versus hinterlands, and over asset-poor and asset-adequate farmers. Strategies for these different segments need to be differentiated for overall inclusive transition to the urbanized African food economy. It will be important to help a broader set of farmers, including female agricultural entrepreneurs, to access inputs and rural services and extension information to take advantage of this growing market. At first, this will be an issue of volume and cost; increasingly, over time, it will be an issue of quality differentiation and food safety.



CHAPTER 5

Economic Recovery in Africa and Its Determinants

Ousmane Badiane, Julia Collins, Xinshen Diao, and John Ulimwengu

Introduction

After years of stagnation and decline, the last two decades have seen an unprecedented agricultural and overall economic recovery in Africa. Although the scope of the recovery is noticeable, the drivers and the sustainability of the continent's current improved performance are less well understood. Some argue that the growth recovery is largely the result of rising commodity prices (for example, Lipton 2012), with concurrent negative effects on other sectors and risks of decline following future price drops. While the impact of natural resources remains undeniably important, there have been periods of global commodity booms in the past, and they did not generate similar growth outcomes. At best, a limited number of countries benefited from such positive global trends, and often only briefly. Never have African economies been able to respond so broadly and so sustainably to improving global economic conditions. Hence, the real story is not what happened in global markets and outside Africa, but what happened within Africa to enable economies to respond so strongly and positively to global market changes. Africa's relatively healthy growth during the recent global food and financial crises is another testimony to the dominance of internal factors in driving the recovery process. In fact, chapter 6 by Badiane and McMillan provides evidence that domestic demand has played a much larger contribution to growth than commodity exports.

Any observer of economic development in Africa will have noticed that the recent decade and a half has been the only time in the continent's history that a large majority of countries have managed to sustain high and accelerating rates of economic growth over such a long period. The explanation must involve factors that not only have affected almost every country but also have generated broad, sustained structural changes. These

would include progress made in political and economic governance as well as investment in economic infrastructure. Preceding and concomitant with the economic recovery are a steady increase in the number of countries transitioning toward more open and pluralistic policy systems, a sharp reduction in the number of countries with conflict and civil unrest, a near universal move toward more private-sector-friendly economic policy regimes, and, more recently, a surge in investments in all major economic sectors. All these factors will continue to be the drivers of growth and determinants of its sustainability in the decades to come. They will determine whether African economies will be able to meet growth challenges and seize opportunities facing them.

In this paper, we review the characteristics of Africa's recent growth performance, discussing the drivers, future outlook, and potential risks. The roles of governance and policy reforms, investment, and the management of mining and other natural resource sectors are highlighted. In the first section, we analyze economic growth and agricultural productivity trends since independence. As economic performance by African countries has changed drastically, we assess the current performance against the long-term growth trajectory of African economies since the 1960s. Given the breadth of the recovery process, we also look for evidence of convergence among African economies as well as between African economies and the rest of the world. In section 2 we review the evolution of economic development and growth policies and strategies in Africa. We compare Africa's reform experience with that of one of the successful emerging economies, China, to examine the factors contributing to the success of policy reforms. This evaluation is followed by an econometric analysis of the drivers of growth in section 3. The final section summarizes the evidence

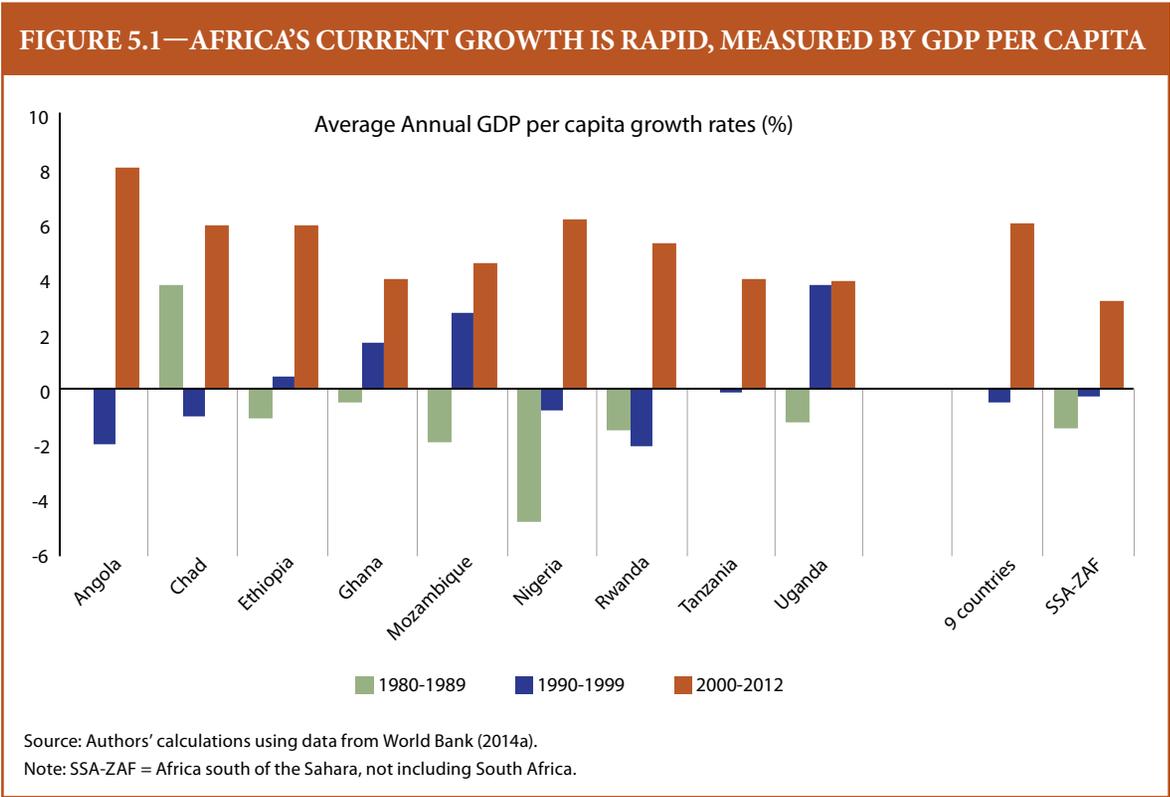
and provides recommendations for sustaining agricultural and economic growth and avoiding potential risks.

Trends in Africa's Past and Current Growth

How Rapid Is Africa's Current Growth Compared to Past Growth?

As shown in Figure 5.1, Africa's growth performance in the last decade and a half represents a dramatic improvement over past trends. For 36 countries

in Africa south of the Sahara (SSA) with readily available data, not including South Africa, the average annual gross domestic product (GDP) per capita growth rate in 2000–2012 reached 3.2 percent, the highest rate of growth in five decades, and an important departure from previous decades of negative per capita growth rates. The growth rates of the nine fastest-growing countries in SSA are shown on the left of the graph; these countries represented 31 percent of SSA's total GDP and 48 percent of SSA's total population in 2000–2012 (World Bank 2015). Most of the countries had negative per capita GDP growth rates in the 1980s and five were still contracting in the 1990s, but their average annual growth rate in the 2000s reached 6.0 percent.



Changes in labor productivity are particularly important in relation to efforts to reduce poverty. Here too, recent growth has been impressive and has far outstripped growth in the previous decades (Figure 5.2). The average annual labor productivity growth for the 21 countries in SSA included in the Conference Board’s 2015 Total Economy Database³⁰ (not including South Africa) was 3.2 percent during the 2000–2013 period, a marked increase over the negative growth rates of previous decades. Most of the fast-growing countries shown in Figure 5.2 had positive growth rates in the

1960s that turned sharply negative in the 1970s and became positive again only in the 1990s.

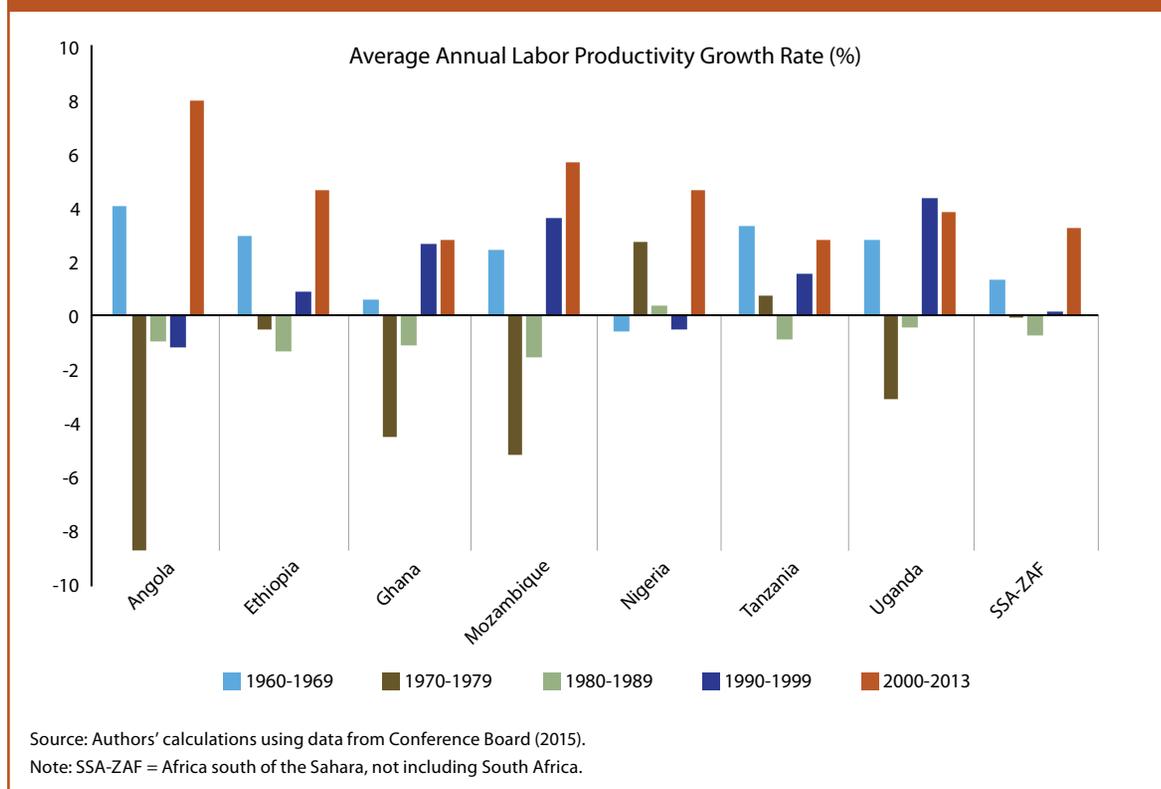
Similar growth trends are seen in labor productivity in agriculture, the livelihood of most of the region’s poor (Figure 5.3). For 39 countries in SSA, not including South Africa, the annual average agricultural labor productivity growth of 1.2 percent in the 2000s was a historical high and surpassed its level of the 1960s of 1.0 percent. Productivity growth was negative during the 1970s, at -2.0 percent.

Has Africa Made Up for Its Lost Decades?

Africa’s recent rapid growth should be viewed in light of the preceding decades of stagnation and even deep decline. Benin et al.’s (2011) analysis of Africa’s agricultural total factor productivity showed that the rapid agricultural productivity growth since the 1980s simply allowed the continent to catch up with its total factor productivity levels of the 1960s. Indeed, Africa’s recent economic growth may not have been sufficient to put the continent back on its growth path of the early post-independence years,

³⁰ The Total Economy Database includes annual data on GDP, population, employment, and productivity. Available from <https://hcexchange.conference-board.org/data/economydatabase/index.cfm?id=27762>.

FIGURE 5.2—AFRICA’S CURRENT GROWTH IS RAPID, MEASURED BY GDP PER CAPITA

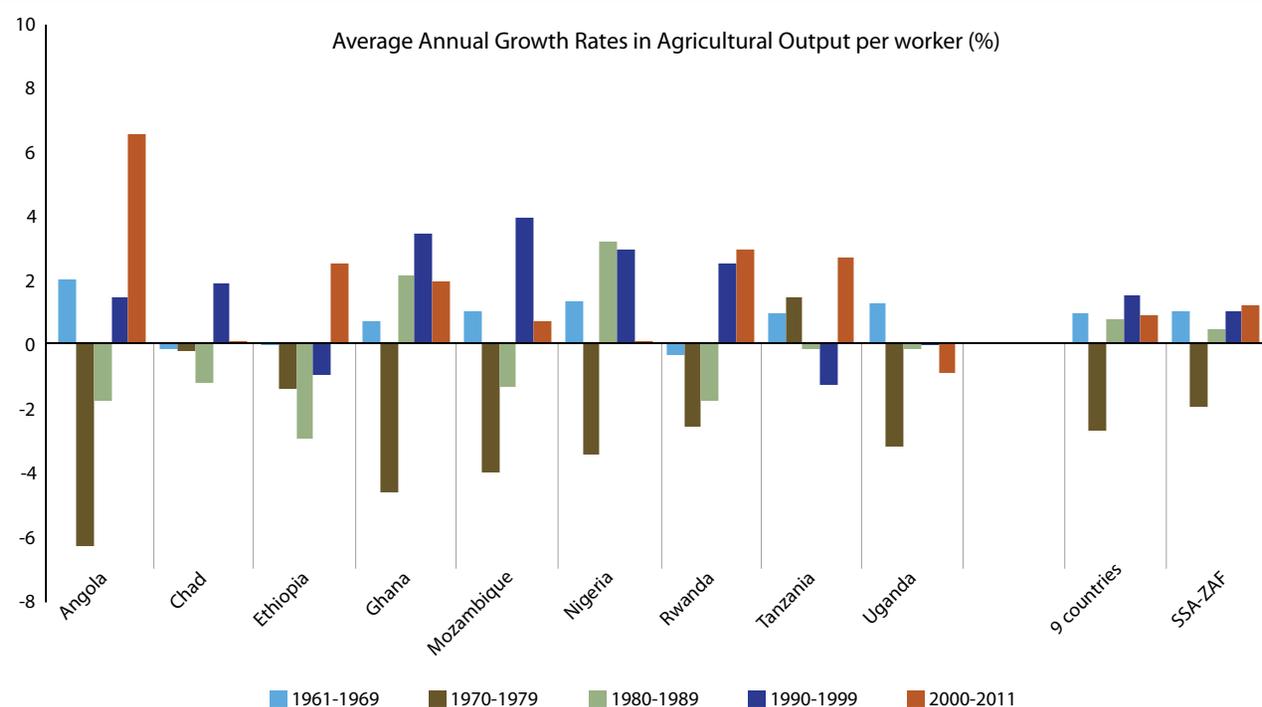


when many analysts predicted that Africa would grow more rapidly than Asia (Easterly and Levine 1997). In this subsection, we evaluate whether Africa's recent growth represents a full recovery from the lost decades of economic decline, in the sense that the growth has allowed African countries to reach the growth trajectories they began during the 1960s. To the extent that current levels of GDP and productivity remain below the levels that would have been achieved if countries had maintained their earlier growth

rates, African countries are still facing the consequences of the lost decades in terms of lower standards of living, and stronger efforts to accelerate the recovery are needed. Figure 5.4 shows the per capita GDP trajectory for 27 SSA countries with data available from the 1960s. Actual per capita GDP levels are graphed in red, as well as projected levels up to 2025 based on the growth rates of the 2000s. The dotted line shows the GDP per capita levels that would have been obtained if the countries had maintained

their growth rates of the 1960–1977 period. If this group of countries had continued growing at 2.0 percent per year, their average annual rate during 1960–1977, GDP would have reached a level of US\$1,428 (in 2005 dollars) per capita by 2012, almost double the actual level. Instead, after reaching \$694 in 1977, GDP per capita for this group of countries declined steadily over the next two decades, reaching a low of \$511 in 1995 before rising again.³¹ The group's GDP per capita did not surpass its 1977 level until 2010.

FIGURE 5.3—AFRICA'S CURRENT GROWTH IS FASTER, MEASURED BY AGRICULTURAL OUTPUT PER WORKER



Source: Authors' calculations using data from Nin-Pratt (2015).
 Note: SSA-ZAF = Africa south of the Sahara, not including South Africa.

³¹ All dollar figures throughout are US dollars.

Sustaining SSA's current growth rate of 3.2 percent will not be enough to allow the group of countries to reach the level of their 1960–1977 growth path by 2025: the projected 2025 GDP per capita value of \$1,147, if current growth rates are maintained, represents only 62 percent of the projected value of \$1,841 that would have been achieved if GDP per capita had grown continuously at the 1960–1977 rate. Reaching this level by 2025 would require more than doubling current growth rates, to an annual rate of 7.0 percent, as shown by the dashed line. This is unlikely to be accomplished, as

only five African countries achieved a per capita GDP growth rate of over 5 percent during the 2000s. If growth continues at current rates, the group of countries will reach their 1960–1977 growth path only in 2066.

Table 5.1 lists the maximum levels of per capita GDP achieved in 33 SSA countries during the 1960–1977 period and the 2000–2012 period. For 12 countries, the maximum recent level of GDP per capita is still lower than the maximum level of the 1960s and 1970s, indicating that not only have these countries not reached their projected levels had they remained

on the post-independence growth path, they have not even matched the absolute levels achieved in the past. While some of these countries are close to meeting their past GDP per capita levels, several are very far off: the Democratic Republic of the Congo's, Gabon's, Liberia's, and Niger's maximum GDP per capita levels of the 2000s are only about half their maximum levels of the 1960s and 1970s, or less.

Trends in labor productivity are just as striking. Of the 21 SSA countries with available data, 9 have not surpassed their labor productivity levels of earlier decades (Table 5.2). As is to be expected, there is significant overlap between the lists of countries that lag behind their past levels of GDP per capita and of those that lag behind their past labor productivity levels. As in the previous table, the Democratic Republic of the Congo and Nigeria show current levels of labor productivity that are far below the levels of the 1960s.

FIGURE 5.4—AFRICA HAS NOT RECOVERED THE GROUND LOST IN EARLIER DECADES

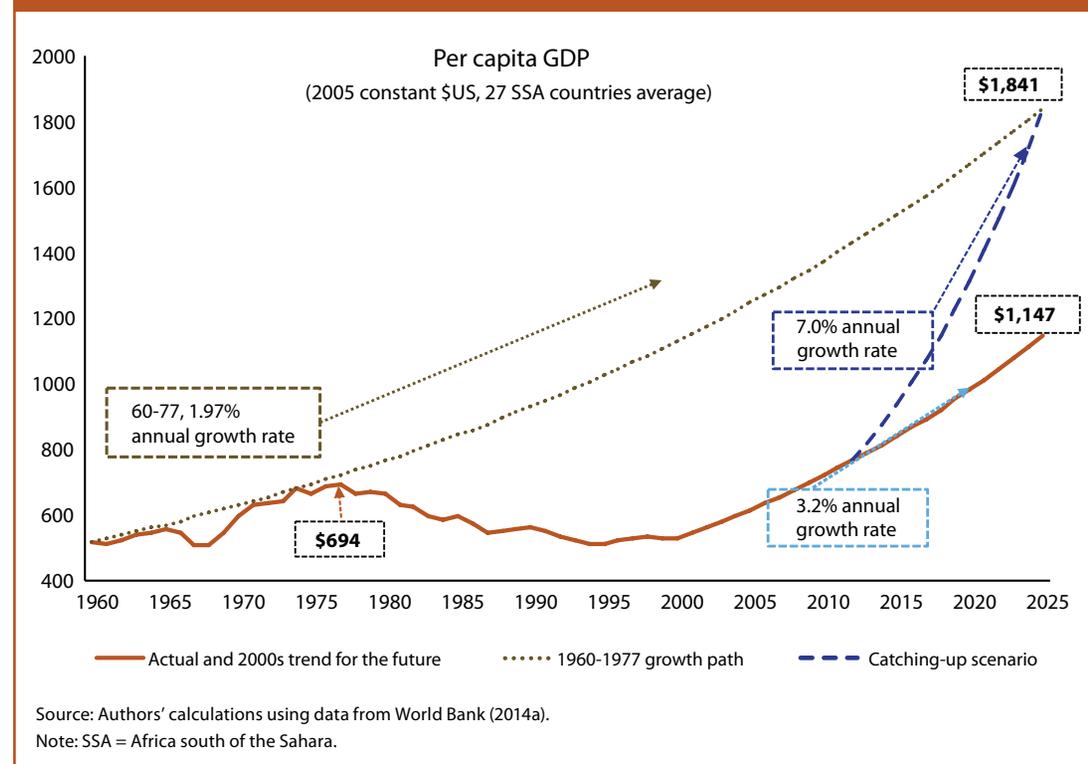


TABLE 5.1—COMPARISON OF MAXIMUM-LEVEL ANNUAL PER CAPITA GDP (constant 2005 USD) IN THE PAST AND PRESENT

	Max in 1960–1977	Max in 2000–2012	Level of annual per capita GDP in 2000–2012 is higher than in the past		Max in 1960–1977	Max in 2000–2012	Level of annual per capita GDP in 2000–2012 is higher than in the past
Benin	451	568	Yes	Rwanda	228	390	Yes
Botswana	1,440	6,684	Yes	Senegal	874	800	
Burkina Faso	244	495	Yes	Sierra Leone	432	435	Yes
Burundi	203	153		South Africa	5,136	6,003	Yes
Cameroon	838	964	Yes	Sudan	565	837	Yes
Central African Republic	499	472		Swaziland	1,196	2,451	Yes
Chad	565	738	Yes	Togo	478	413	Yes
Congo, Dem. Rep.	485	165		Zambia	1,085	798	
Congo, Rep.	1,379	1,944	Yes	Zimbabwe	733	681	
Côte d'Ivoire	1,659	1,014					
Gabon	12,452	6,709					
Gambia	444	467	Yes				
Ghana	512	724	Yes				
Guinea-Bissau	438	436					
Kenya	495	595	Yes				
Lesotho	393	929	Yes				
Liberia	728	276					
Madagascar	501	302					
Malawi	220	250	Yes				
Mali	372	498	Yes				
Mauritania	821	835	Yes				
Mauritius	2,012	6,496	Yes				
Niger	560	290					
Nigeria	876	1,072	Yes				

Source: Authors' calculations using data from World Bank (2014a).

TABLE 5.2—COMPARISON OF MAXIMUM-LEVEL ANNUAL LABOR PRODUCTIVITY IN THE PAST AND PRESENT (1990 USD)

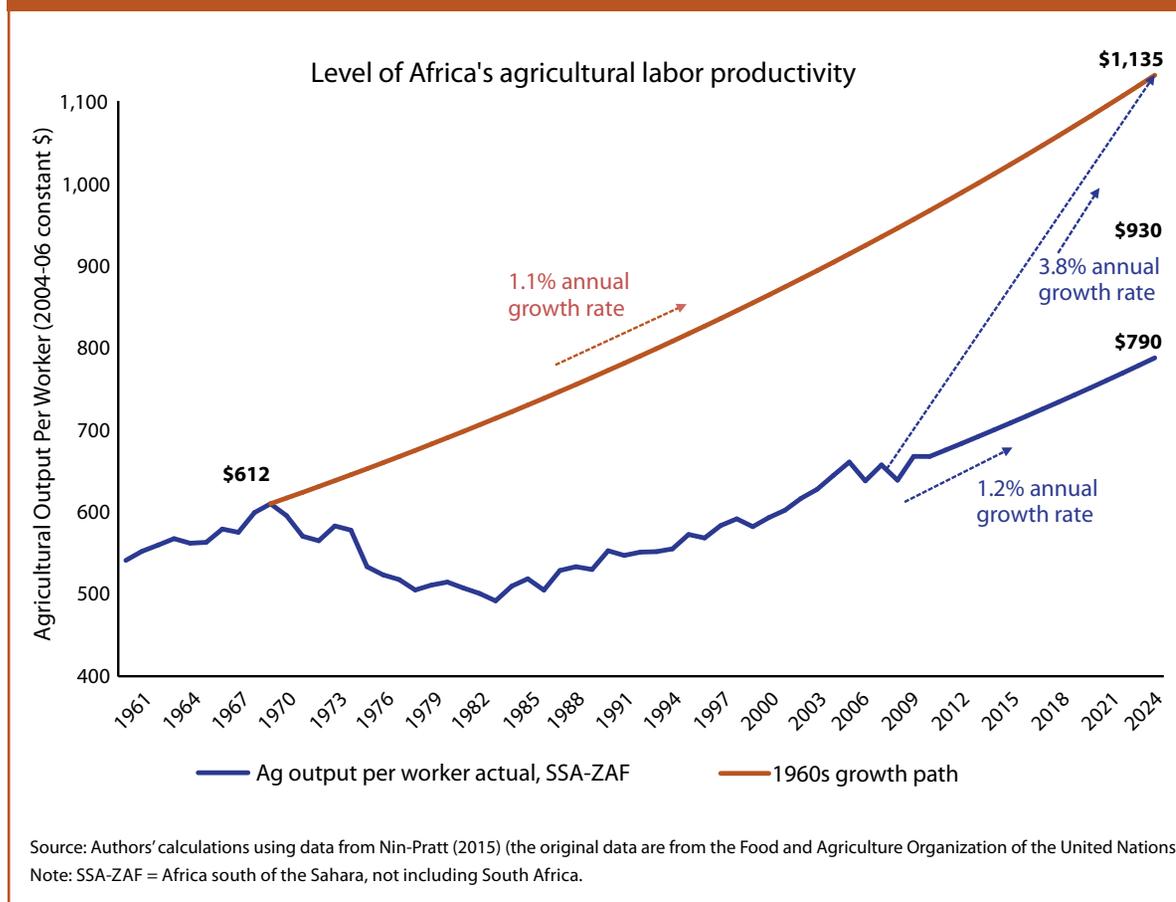
	Max in 1960s	Max in 1970s	Max in 1980s	Max in 1990s	Max in 2000–2014	2000s is higher than the past
Angola	4,353	4,793	2,618	2,506	4,896	Yes
Burkina Faso	1,744	1,852	2,277	2,522	3,838	Yes
Cameroon	2,329	2,901	4,668	3,385	3,060	
Congo, Dem. Rep.	4,510	5,551	5,653	3,791	3,408	
Côte d'Ivoire	2,266	2,406	1,813	1,617	957	
Ethiopia	1,483	1,582	1,512	1,305	2,305	Yes
Ghana	4,080	4,061	2,719	3,264	4,976	Yes
Kenya	2,522	3,087	3,417	3,448	3,397	
Madagascar	2,759	2,900	2,512	1,952	1,785	
Malawi	1,166	1,689	1,517	1,486	1,829	Yes
Mali	1,855	2,821	2,557	2,795	3,545	Yes
Mozambique	3,944	4,416	2,958	3,735	8,128	Yes
Niger	2,658	2,514	2,416	1,680	1,764	
Nigeria	2,254	3,651	3,491	3,468	6,620	Yes
Senegal	6,418	6,190	4,701	4,166	4,710	
South Africa	11,563	14,798	16,086	13,158	17,110	Yes
Sudan	4,479	5,078	4,131	4,166	6,782	Yes
Tanzania	1,351	1,468	1,397	1,497	2,380	Yes
Uganda	2,394	2,384	1,757	2,180	3,632	Yes
Zambia	3,688	3,553	3,071	2,723	3,565	
Zimbabwe	3,404	4,532	4,396	4,040	3,856	

Source: Authors' calculations using data from Conference Board (2015).
Note: Data are in 1990 US dollars, converted at Geary-Khamis purchasing power parities.

We also assess the quality of growth in agriculture, which is the largest sector in terms of employment in most African countries and still accounts for the largest share of GDP in some countries. Sustaining rapid agricultural growth is the most effective way to reduce poverty, and agricultural growth plays an important role in stimulating growth in the wider economy (Diao et al. 2012). Recent agricultural labor productivity growth has also not made up for the ground lost in previous decades. The group of 38 countries with available data shown in Figure 5.5 exhibit trends similar to the per capita GDP growth trends shown in Figure 5.4: substantial agricultural labor productivity growth during the years after independence was followed by steady declines that more than erased the gains made during the 1960s. The turning point where agricultural labor productivity turned positive again occurred in the mid-1980s, a decade earlier than the lowest GDP per capita level registered by the group of countries shown in Figure 5.4. This suggests that, in Africa, agricultural growth may have affected overall economic growth with a lag. If agricultural labor productivity continues to grow at its average rate of the 2000s, 1.2 percent, the projected labor productivity level of \$790 in 2025 will still be more than 40 percent lower than it would have been if African countries had been able to maintain their 1960s growth rate of 1.1 percent throughout the

following decades. Reaching the 1960s growth path by 2025 would require sustaining annual average growth rates of 3.8 percent; however, only seven African countries achieved or surpassed this growth rate during the 2000s. If the current growth rate of 1.2 percent is maintained, it will take more than six centuries to reach the 1960s growth path. This reality highlights

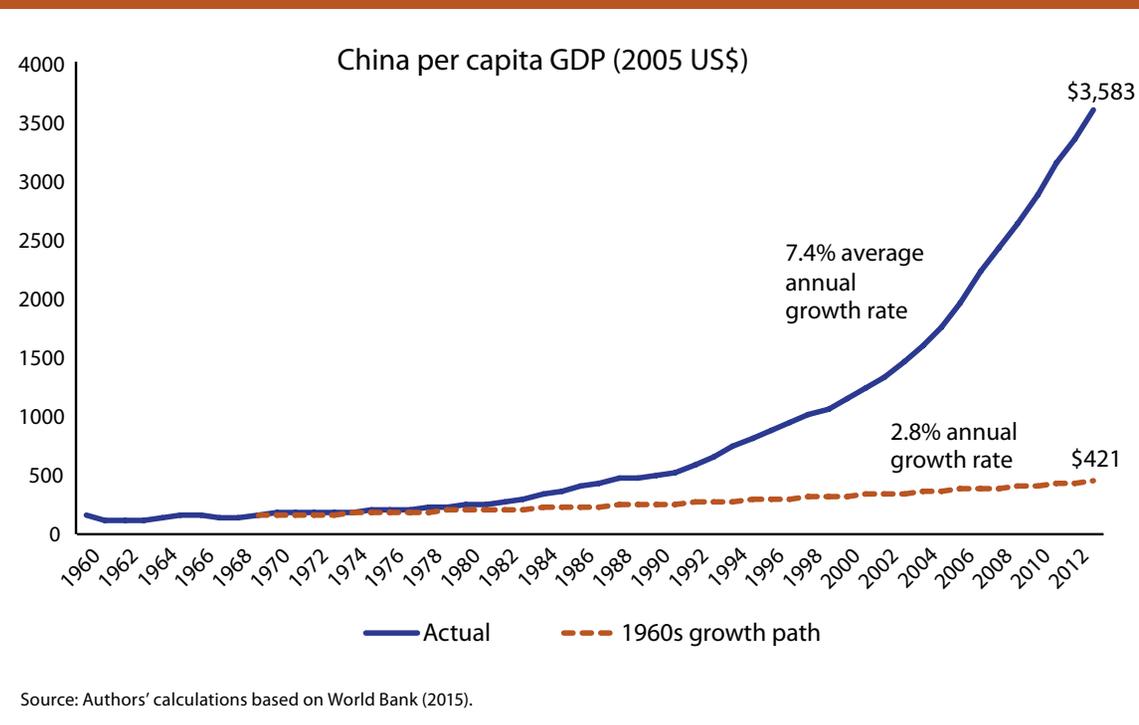
FIGURE 5.5—AFRICA’S AGRICULTURAL PRODUCTIVITY GROWTH HAS NOT MADE UP FOR LOST DECADES



the imperative of significantly increasing efforts to boost agricultural sector productivity by successfully implementing the Comprehensive Africa Agriculture Development Programme (CAADP) agenda and achieving the key Malabo targets.

One factor contributing to the challenge of increasing agricultural labor productivity growth is the higher growth rate of the rural population and hence of the agricultural labor force, which has averaged 2.2 percent per year from 2000 to 2011, compared to 1.9 percent during the 1960s. As Nin-Pratt and Yu (2008) point out, total factor productivity growth in SSA is primarily a result of catching up to the frontier; as a result, agricultural growth is likely to slow in the future unless African countries pursue aggressive strategies to accelerate innovation along the agricultural value chain. Significantly increasing the labor productivity growth rate seems unlikely without moving more labor out of agriculture: South Africa was able to achieve a 3.0 percent annual agricultural productivity growth rate from 1961 to 2011, but its agricultural labor force fell by 1.2 percent yearly throughout the period. The paper by Badiane and McMillan analyzes sectoral employment dynamics since the early 2000s and shows that labor migration has started to move in a direction that is growth enhancing. The paper also shows that much needs to be done within and outside the agricultural sector to accelerate and deepen the growth-enhancing structural transformation that is currently ongoing. Additional

FIGURE 5.6—CHINA'S PER CAPITA GDP GROWTH



efforts to improve agricultural productivity must include increasing access to improved inputs, information, finance, and markets, among other factors.

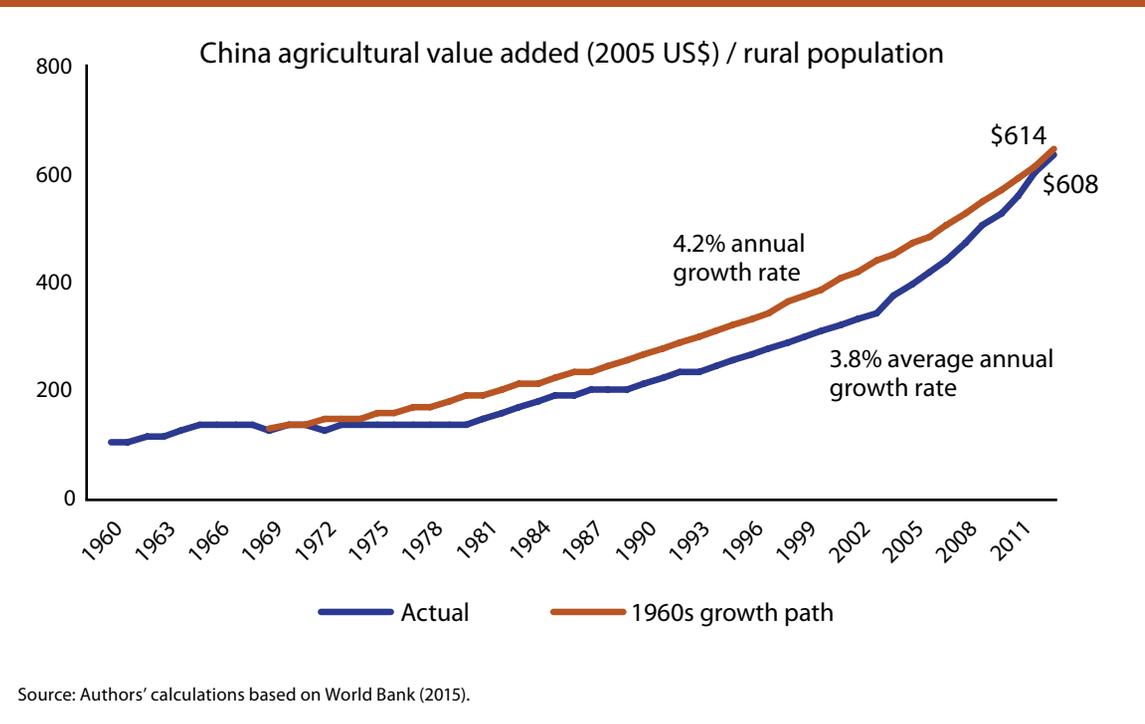
China's experience, where fairly flat growth in the 1960s and 1970s gave way to extremely rapid and sustained growth in later decades, stands in sharp contrast to Africa's. More than that of any other developing country or region, the example of China demonstrates that it is possible to manage the development process such as to achieve dramatic improvements in living standards and reductions in poverty in the space of a generation. We will explore some of the reasons for the contrast between China's and Africa's experiences later in the chapter. Here we compare Africa's failure to fully recover from decades

of economic decline with China's success. Figure 5.6 shows that China's economic performance of the 1980s, 1990s, and 2000s was a marked shift away from stagnant per capita GDP rates to vigorous and dynamic growth. As a result, China's GDP per capita in 2012 rose to more than eight times the level that would have been reached had the country continued growing at 1960s rates. The growth performance has been less dramatic in the agricultural sector, but here too the experience is in stark contrast to what has been observed among African countries. As shown in Figure 5.7, growth in Chinese agricultural productivity, proxied by agricultural value-added divided by rural population, did falter slightly in the 1970s compared to the previous decade, but the country's later strong growth put it back onto the 1960s growth path. Actual agricultural productivity in 2012 (\$608) barely differs from the level on the 1960 trajectory (\$614).

Is There Evidence of Convergence in Africa's Recent Growth Recovery?

We have shown that although growth in Africa is rapid, it has not made up for the stagnation of earlier decades: incomes and agricultural productivity remain far below the levels they would have achieved if African countries had remained on their 1960s growth paths. In this subsection, we analyze whether lower-income economies have been catching up with

FIGURE 5.7—CHINA'S AGRICULTURAL PRODUCTIVITY GROWTH



higher-income economies. We also compare convergence dynamics in Africa with the rest of the world. Convergence is a process through which lower-income countries catch up to higher-income countries by achieving faster growth rates. In the third section, we will examine the factors affecting the pace and extent of convergence across countries.³² We look for signs of convergence in order to evaluate the quality of growth in terms of poverty reduction: growth without convergence fails to increase the living standards of people in the poorest countries (relative to wealthier countries) as quickly as growth with convergence.

³² For a discussion of the analysis of convergence and its determinants, see Barro and Sala-i-Martin (2004).

FIGURE 5.8a—GROWTH WITH NO TENDENCY TOWARD CONVERGENCE IN THE 1960s

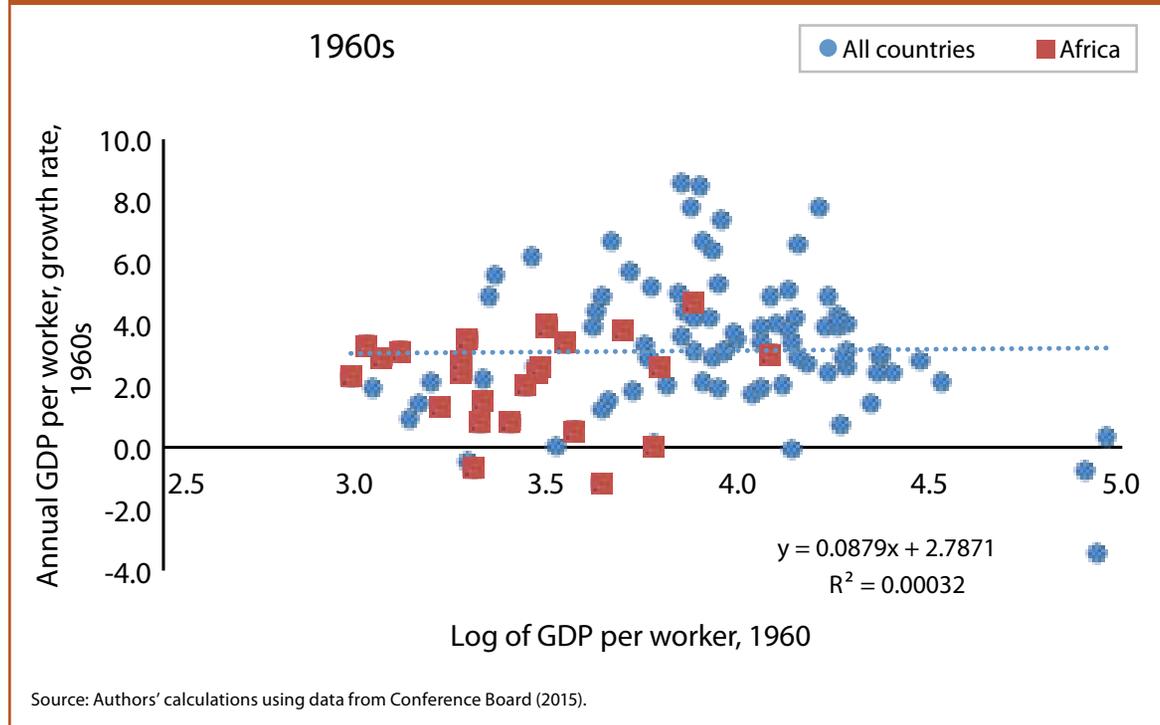
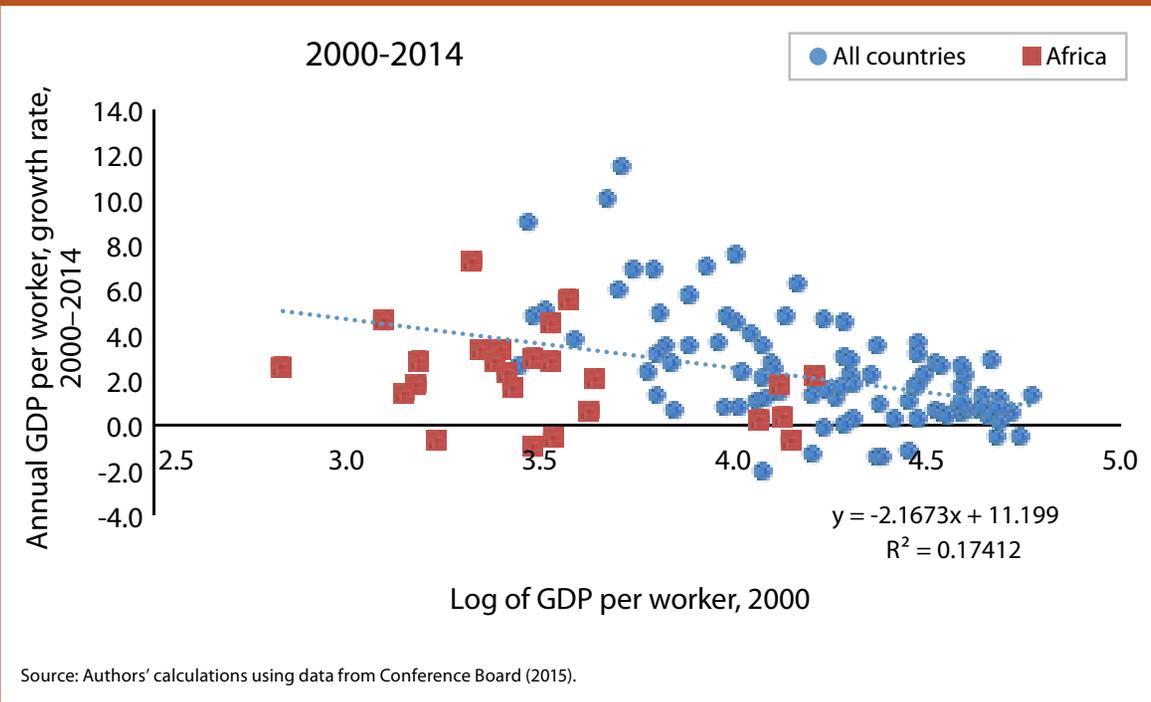


Figure 5.8a illustrates convergence dynamics in terms of overall economic growth. The x-axis shows the log of GDP per worker in 1960 and the y-axis shows the average annual growth rate in GDP per worker for the 1960s. Figure 5.8b repeats the analysis for the 2000s. All countries with available data are included; African countries are represented by squares, and non-African countries are represented by circles. A trend line for all countries is shown by the dotted line. A process of convergence, in which poorer countries grow faster than richer countries and thus gradually close

the gap between the two groups, would imply that countries with lower initial GDP levels (countries closer to the origin on the x-axis) would have higher growth rates, placing them higher or further away from the origin on the y-axis. It appears from Figure 5.8a that there was no such tendency toward convergence in the 1960s; indeed, countries that started the decade with lower levels of GDP per worker do not show higher rates of GDP growth than those that started off with higher levels of GDP.³³ In contrast, Figure 5.8b shows that countries that began the decade of the 2000s with

³³ Analyses of GDP levels and growth in the following decades (not shown) also reveal no signs of convergence between countries prior to the 2000s.

FIGURE 5.8b—GROWTH SEEMS TO HAVE A TENDENCY TOWARD CONVERGENCE IN RECENT YEARS



Source: Authors' calculations using data from Conference Board (2015).

lower levels of GDP per worker did tend to grow faster. The coefficient of the associated trend line is -2.2 , indicating a clear negative relationship between initial GDP levels and subsequent growth.

Several other trends are apparent from Figures 5.8a and 5.8b. During the 1960s, Africa's position was not markedly different from that of other developing regions, as demonstrated by the number of non-African countries with levels of initial GDP per worker and rates of growth that were similar to those of African countries. However, by the 2000s, the

distance between Africa and the rest of the world had increased, meaning that many African countries failed to move as far along the x-axis from the 1960s to the 2000s as did countries outside the continent. The lagging progress reflects the consequences of the economic stagnation and decline of the first three or four decades after independence. The ultimate impact is that, despite converging growth in the 2000s, GDP per worker in Africa has remained low compared to the rest of the world, which has experienced steadier growth over the entire five decades.

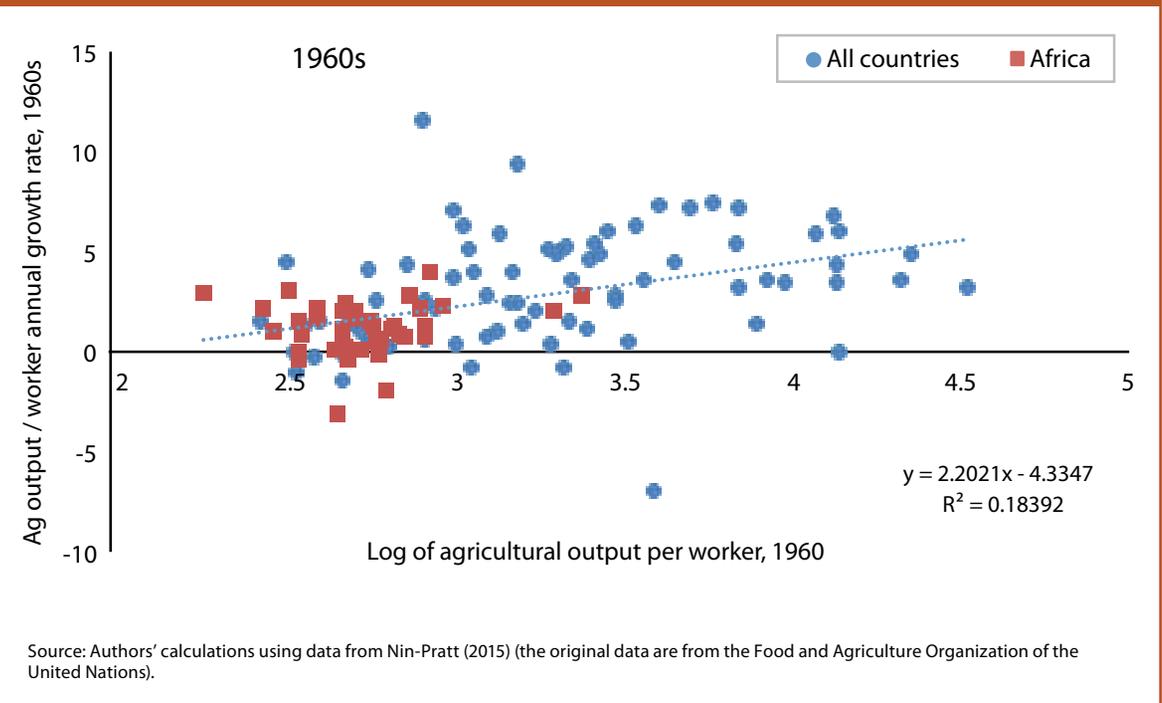
Has There Been Convergence in Agricultural Growth?

As agricultural labor productivity in Africa began its recovery before that of overall economic growth, it may be that convergence in the agricultural sector preceded convergence in the broader economy. The comparison of Africa's agricultural productivity growth with that of other countries suggests that this is not the case. Figures 5.9a and 5.9b plot initial levels of log agricultural output per worker against average annual growth rates for the 1960s and 2000s, respectively. The figures indicate that there has been no apparent convergence in agricultural labor productivity, either in the 1960s or in the 2000s. In fact, countries with higher initial levels of labor productivity grew faster than those with lower productivity, as evidenced by the positive coefficients on the trend lines for both decades. Thus, gaps between labor productivity levels of different countries widened rather than narrowed. This widening of the productivity gap is the opposite of the convergence in the formal manufacturing sector documented by Rodrik (2013b). The non-convergence in agriculture is reflective of the extremely slow catch-up growth observed among African countries, as discussed in the preceding subsection. It may also be an additional reason for the lack of overall economic convergence observed across countries until the 2000s.

The Evolution of Sector Governance and Economic Growth

We have seen that Africa is still recovering from the economic decline of its lost decades, and in fact still has a long way to go even if current growth is maintained. The continent's recent performance, while truly encouraging, is far from sufficient. Accelerating and sustaining the current growth recovery is a strategic imperative. This requires a better understanding of the drivers of recent growth, which in turn calls for an examination of the ways in which

FIGURE 5.9a—AGRICULTURAL GROWTH WITH NO TENDENCY FOR CONVERGENCE IN THE 1960S



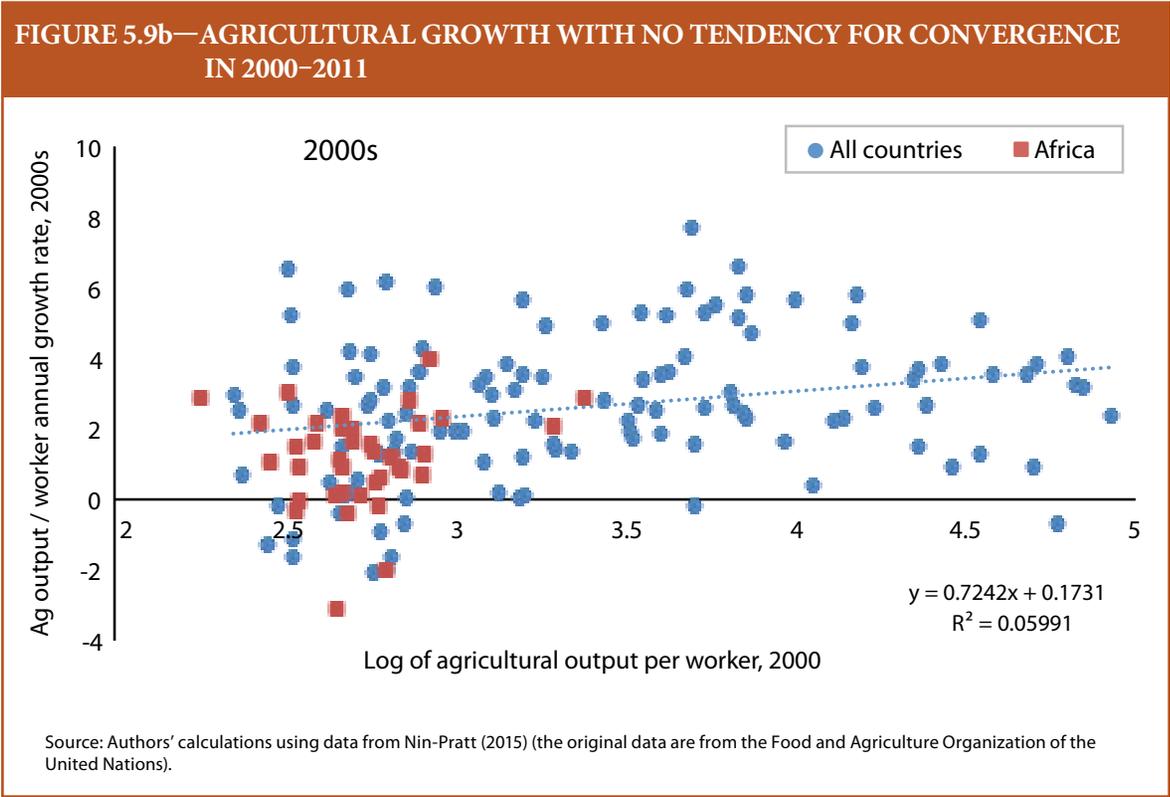
Africa has managed its growth process throughout the decades and the role played by key factors over time.

Africa, unlike any other developing region, has struggled for decades to find the proper strategic approach and direction for economic policy design and sector governance. At the time when most countries gained independence, the economic development profession itself had an incomplete understanding of the growth process and hence of its proper management. Inadequate policy regimes in many African countries, based on still-forming development theory at the time and implemented by newly

formed and underequipped bureaucracies, led to decades of widely shifting externally driven strategies. Economic growth and sector governance lacked the quality, consistency, and coherence necessary for successful outcomes. To highlight this fact, we compare the evolution of reforms and strategies pursued by African countries over the past six decades with the successful pacing and sequencing of reforms by China from the late 1970s to the present. As will be shown, the largely externally driven and hence rather volatile strategy regimes in Africa contrast starkly with regimes in China, where major policy reforms were primarily based on pragmatic domestic

experimentation and carried out with a focus and gradualism that made adequate learning and timely course adaptation possible.

The greatest challenge faced by African governments in managing the growth process was finding the right balance between agriculture and industry as the main drivers of growth, and between government and the private sector as key actors in regulating economic activity. Badiane and Makombe (2015) conceptualize these choices with the help of the diagram shown in Figure 5.10, where the x-axis represents the relative sector emphasis of strategy regimes between agriculture and industry and the y-axis the emphasis on government versus private-sector roles. The changing development paradigms and the strategies pursued by African and Chinese leaders can be placed on the diagram according to their emphasis along these two



dimensions. The point labeled “M” describes a strategy exhibiting no bias toward either the public or private sector nor toward industry or agriculture.

Africa’s Shifting Development Strategies

For each decade, the position of the main strategic thrust in the four quadrants of Figure 5.10 describes the relative biases of strategy choices along the agriculture versus industry axis and the government versus private sector axis. During the first decade of post-independence development, from the 1950s to the 1960s, many governments pursued industry-led, import-substitution-based strategies in which development of the industrial sector was to be driven by an active public sector and promoted through state enterprises operating behind import barriers and other forms of protection. Agriculture was seen as a source of resources to support industrialization. This was very much in line with the prevailing thinking of development theory around the time of independence. The bias toward industry emanated from the recognition that potential rates of growth were substantially higher in industry than in agriculture. Not well understood either in theory or practice at the time was the fact that industrial growth was only possible when fueled by faster agricultural growth.³⁴ Import-substitution industrialization was consequently characterized by strong biases against agriculture and the private sector. Even in the agricultural sector, government was highly involved through parastatal organizations controlling the buying and selling of crops, including to foreign export markets, and

the procurement and distribution of modern inputs: seeds, fertilizers, and pesticides. The parastatals also determined and enforced the prices of individual crops, which required the prohibition or heavy restriction of the selling, buying, or transportation of agricultural commodities by private-sector operators. Consequently, agriculture was subjected to heavy taxation, implicitly and explicitly, and considerable regulatory disruption, which survived the import-substitution industrialization strategy era and played a significant part in the poor performance of the sector and in the broader economic decline and stagnation referred to earlier.³⁵ The import-substitution industrialization strategy’s emphasis on industry as the main source of growth and the very limited role accorded to the private sector place this stage in the upper right of the diagram in Figure 5.10.

As would be discovered later, import-substitution industrialization strategies did not result in improved economic performance. Both agricultural growth and overall economic growth lagged badly in the ensuing decade. Rural-urban inequality increased as agriculture failed to grow, create wealth, and change living conditions in the rural areas, while the bias toward industry favored urban centers. In response to these developments, multilateral and bilateral development agencies, which had major influence on growth and development strategy choices, began to shift focus in the 1970s. Alarmed African governments also sought to boost agricultural production, particularly of food crops, in pursuit of the goal of food self-sufficiency. Import-substitution industrialization therefore gave way to integrated rural development projects, which aimed to improve rural

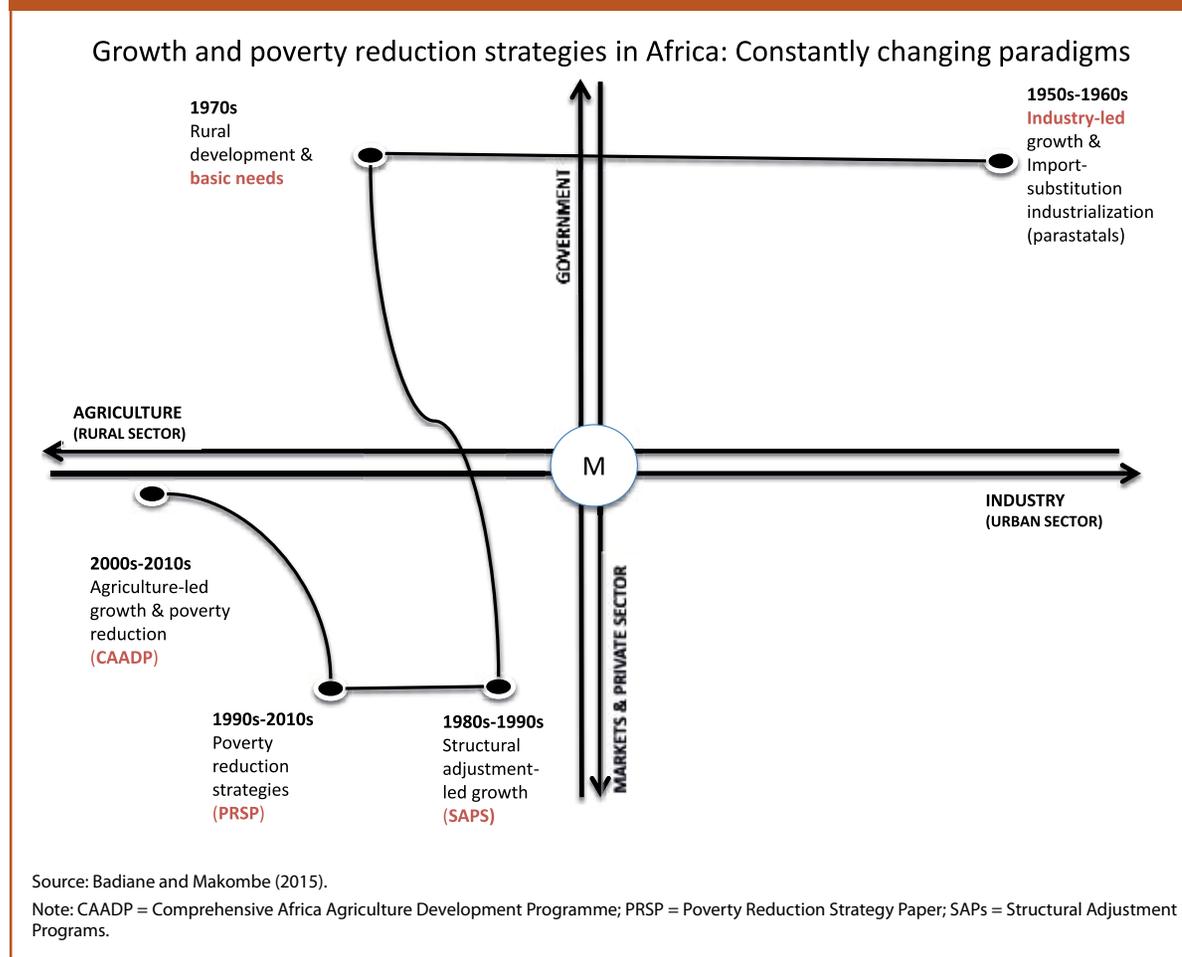
³⁴ Johnston and Mellor (1961) had just published their pioneering work.

³⁵ See Oyejide (1986), Tshibaka (1986), and Badiane and Kinteh (1994) for discussions of the negative effects of policy and trade regimes on agriculture in Nigeria, Zaire, and selected African countries, respectively.

livelihoods by raising agricultural productivity as well as increasing access to education and health services among rural communities. Linked to integrated rural development is the basic human needs approach, which emphasized increasing incomes, ensuring access to social services, and increasing stakeholder participation in the planning of development programs. This translated into a heavy shift to the upper left quadrant of the diagram in Figure 5.10, with the focus moving away from industry toward agriculture. However, the role of government as the central development actor remained nearly intact. Many of the agricultural development projects pursued during the 1970s did not succeed due to their high costs, and education and health indicators did not improve despite the basic human needs approach.

During the 1980s and 1990s, African development strategies underwent another major shift through the Structural Adjustment Programs (SAPs) promoted by the International Monetary Fund (IMF) and the World Bank. SAPs intended to accord a stronger role to markets and the private sector in regulating and operating economic activity. By seeking to correct the public-sector bias and its associated implicit and explicit taxation of agriculture, SAPs de facto tended to tilt the balance from industry and more in favor of agriculture.

FIGURE 5.10—GROWTH AND POVERTY REDUCTION STRATEGIES IN AFRICA: CONSTANTLY CHANGING PARADIGMS



Agricultural policies promoted through SAPs included reducing the role of marketing boards and parastatals, liberalizing input and output markets by reducing fertilizer subsidies, limiting price intervention, and reducing overvalued exchange rates. These changes resulted in rising outputs of

export crops in some countries, but in many others the supply response was smaller than anticipated.

Because of heavy cuts in government expenditures, complementary investments in agricultural technology, infrastructure, and market institutions were not made at that time. It could also be that economies needed more time to respond to the far-reaching changes along with the complex ramifications that emerged. At any rate, it was clear that the reforms that were carried out did not result, as hoped for, in overall improved economic growth and poverty reduction in the 1980s and early 1990s.³⁶

The failure to make progress in reducing poverty and recognition of the lack of country participation in the SAPs led in the late 1990s to another major qualitative shift, to the Poverty Reduction Strategy Paper (PRSP) approach. Under the PRSPs, countries set out the policy reforms they intended to implement to promote growth and reduce poverty in a participatory process involving domestic civil society organizations as well as the World Bank and IMF. Unlike the SAPs, the PRSPs put social sectors clearly, either by design or de facto, at the fore. The PRSPs maintained the SAPs' emphasis on the private sector and markets but shifted the focus of development strategies further toward the rural sector, recognizing agriculture as a key sector to lead broad-based growth and poverty reduction. However, this recognition did not initially lead to increased investments in agriculture. Moreover, many of the SAP agricultural policies were maintained in PRSPs, and country participation was more limited in general than intended.

By the end of the millennium, the four decades of searching for effective development strategies that would produce decent growth and

generate real economic and social progress had failed to meet the hopes and aspirations of people in Africa. Despite good, and in some cases better, prospects than other developing regions at the time of independence, Africa was now lagging behind badly in nearly all measures of economic and human development. The costs and controversies associated with SAPs and the limited success of PRSPs severely curtailed the propensity of global development organizations, multilateral as well as bilateral, to venture into major agenda-setting efforts.

The time also coincided with important leadership changes at the continental level. Presidents Thabo Mbeki of South Africa, Olusegun Obasanjo of Nigeria, Abdoulaye Wade of Senegal, and Abdelaziz Bouteflika of Algeria all came to power around that time with an ambitious pan-African agenda. They launched a continent-wide initiative under the leadership of the African Union Commission (AUC) called the New Partnership for Africa's Development (NEPAD). Through it, they sought to reform the relationship between the global development community and Africa and put African countries in a stronger leadership position in deciding the continent's future development agenda. A centerpiece of their efforts was the demand for greater commitment to and accountability for improved political and economic governance on the part of African governments (AUC 2001). Under NEPAD, African countries initiated, in 2003, the Comprehensive Africa Agriculture Development Programme (CAADP), which shifted the emphasis further toward agriculture. Because of the relevance of China's experience for the implementation of this program, we will return to the discussion of CAADP after the review of Chinese reforms in the agricultural sector in the next subsection.

³⁶ The fact that the reforms called for were not fully implemented in many countries makes the assessment of SAPs in general a rather difficult exercise (Jayne et al. 2002).

Reforming Agricultural and Rural Development Strategies: The Chinese Experience

To see what a more consistent and coherent approach toward policy and strategy development for economic transformation in general and agricultural and rural-sector growth in particular might have accomplished, we examine the China example. In the 1960s and 1970s, China had far lower GDP per capita and much higher poverty than Africa. Like Africa, it faced a daunting reform agenda. But the reform process in China proceeded much differently from that in Africa, and had far different impacts. China's reform process was characterized by gradualism, country ownership and leadership, and the use of evidence to guide policies (Chen, Hsu, and Fan 2014). Reforms followed a careful trial-and-error process in which successful local experiments were scaled up and unsuccessful initiatives were abandoned. Political support and ownership of reforms were bolstered by the gradualism of the process and the use of evidence. The reform process followed an agriculture-based "firing from the bottom" approach, in which a focus on agriculture preceded reforms in manufacturing and later services. The initial emphasis on agriculture helped enable the large-scale poverty reduction that accompanied growth.

Four stages in China's reform process can be distinguished based on the analysis by Chen, Hsu, and Fan (2014). In the first stage, from 1978 to 1984, agricultural reforms were implemented that greatly increased incentives for producers. Government procurement prices were increased, central control of some production decisions was relaxed, and, perhaps most importantly, agriculture was decollectivized with the implementation of the household responsibility system, under which individual households were given more control over land and production. The government also

invested in agricultural research and development and the development and dissemination of improved seed varieties, which contributed to agricultural growth, poverty reduction, and rising rural incomes. This stage of reform was strongly focused on agriculture and retained a major role for the government, placing it in the upper left of the diagram in Figure 5.11: although market forces were given a larger role in influencing production and resource allocation decisions, the environment was still heavily controlled by the government.

The second stage of reform, from 1985 to 1993, included further liberalization of agricultural output markets, with a shift from procurement quotas to contracts, as well as fertilizer market liberalization. Rural incomes continued to grow, and the increased availability of labor and capital resources resulted in a rapid expansion of the rural nonfarm sector. Township and village enterprises flourished. This stage of reform represents a shift downward and to the right in the diagram: reforms constituted a step toward more market-based systems, but government maintained its role as the main economic player. The proliferation of township and village enterprises represented a widening of focus to the nonfarm economy, but agriculture remained the central area of policy reforms.

During the third stage of reform, from 1994 to 2001, the government maintained control in strategic sectors while liberalizing others. Special Economic Zones were created and foreign direct investment (FDI) was liberalized. Nonstate enterprises were permitted to play a larger role in agricultural trade. Increasingly open trade policies and decreased protectionism led to a major expansion of trade and an increase in the contribution of trade to GDP (Fan, Gulati, and Dalafi 2007). These changes moved the systems further toward greater private-sector participation.

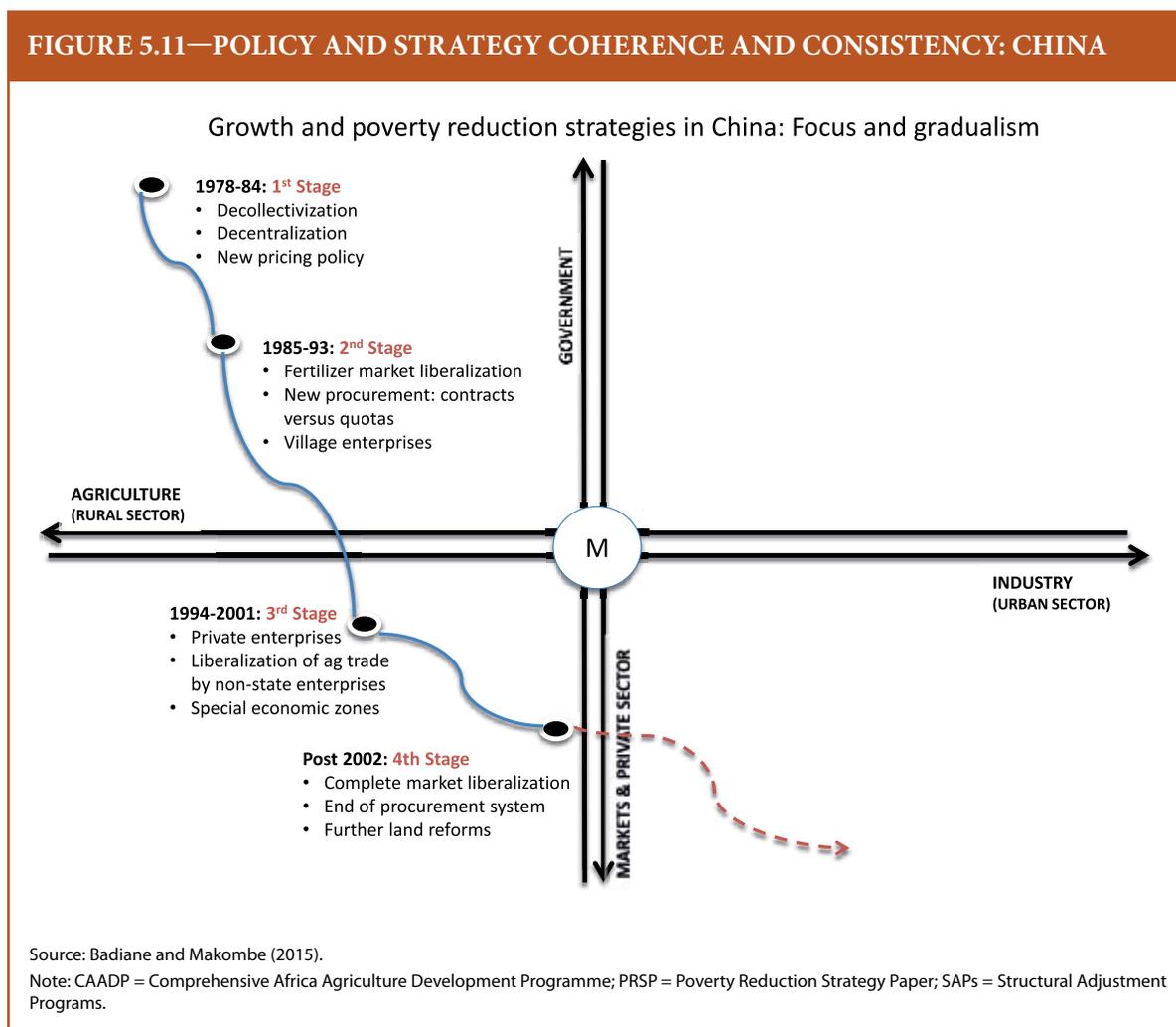
In the fourth stage of reform, from 2002 to the present, the procurement system was ended and grain markets were completely liberalized. Agricultural taxes were progressively reduced and income transfers to farmers were initiated. Land reforms were enacted to further increase tenure security.

Protectionist trade policies continued to be eased (Fan, Gulati, and Dalafi 2007). Infrastructure expansions were financed by both public and private investments. Both the third and fourth stages saw the focus of policy reforms shift even more strongly toward markets and the private sector.

The Chinese reform process has been characterized by gradualism and

the sequencing of reforms, resulting in a coherent shift in focus that has unfolded over decades. Subsequent reforms built on the accomplishments of previous reforms. This approach was permitted by a reliance on smaller-scale experimentation to produce the evidence needed for the decision to scale up to the national level. The country needed nearly three decades to gradually transition toward a more open, private-sector-led, and market-based system. The process was accompanied by careful sequencing and targeting of institutional reforms and public investments. As reflected in Figures 5.12a and 5.12b, institutional reforms provided the largest boost to growth and poverty reduction in the earlier period. When the strongest effects of the reforms were largely played out, rising government investments in the subsequent period deepened the initial responses and extended their impact further (Fan, Zhang, and Zhang 2004).

The Chinese experience therefore represents a major contrast with Africa's multiple abrupt changes of focus. However, Africa seems to have found a more successful approach during the

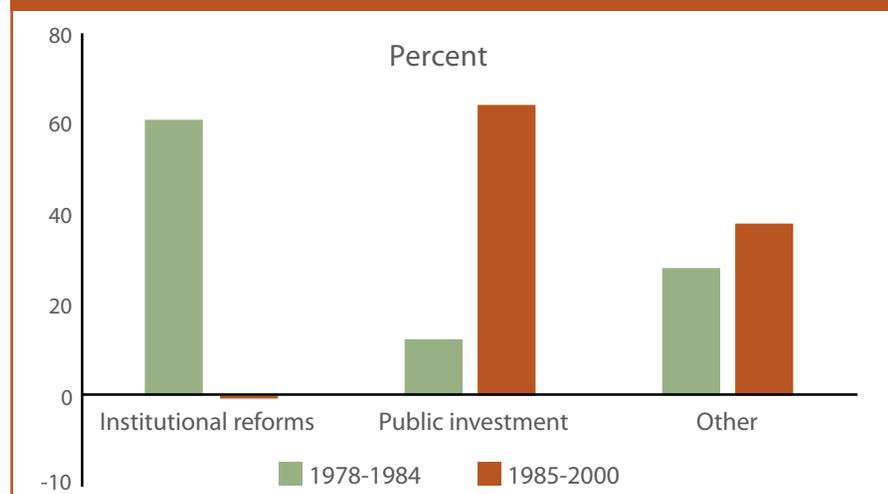


current period. After decades of shifting priorities based on externally driven policies, in the early 2000s African countries seized the leadership role in formulating the continent's development strategies. As indicated earlier, African leaders, in 2003, adopted CAADP as the main framework for agriculture-led development and poverty reduction. Unlike previous strategies, CAADP is a homegrown initiative that emphasizes broad-based participation of stakeholders from the public and private sectors, farmers' groups, civil society, and donors in policy planning, implementation, and review (NEPAD 2003).

The CAADP's emphasis on regular review and mutual accountability and the use of evidence and analysis to guide policymaking represent important improvements over past development initiatives. CAADP

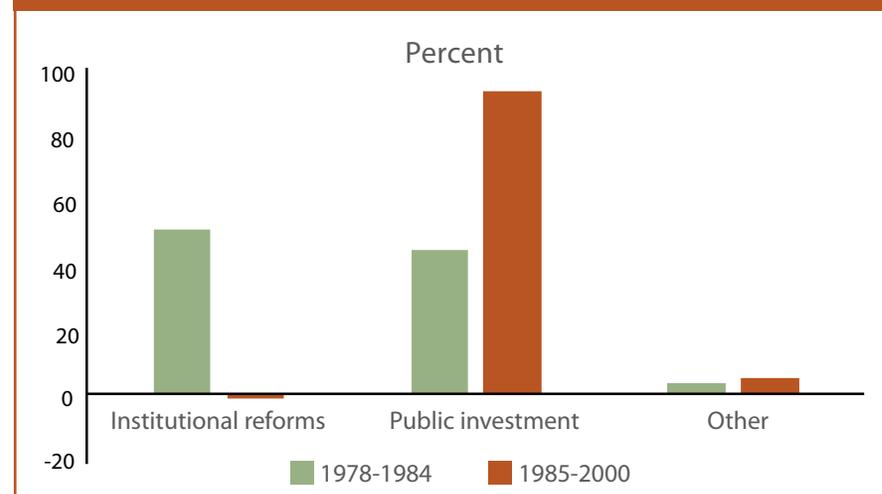
acknowledges the central role of the private sector in agricultural development but advocates a strong role for governments to play in increasing agricultural investment and creating an enabling environment for agricultural growth and private-sector involvement. The current approach to development strategy places agriculture at the center, recognizing the special importance of agricultural growth in poverty reduction as well as its contribution to overall economic growth, but it also calls for much greater balance between government and private-sector roles than earlier strategies. More than ten years after the launch of CAADP, the focus on agricultural production and investments and the principles of inclusivity and mutual accountability seem to be showing the staying power needed to bring results

FIGURE 5.12a—SOURCES OF CHINA'S AGRICULTURAL GROWTH



Source: Authors' construction based on data from Fan, Zhang, and Zhang (2004). Fan, Zhang, and Zhang (2004) estimated the effects of different categories of public investments on poverty and growth at the provincial level, using a simultaneous equations approach to account for the endogeneity of the variables affecting economic outcomes. Year dummies were used to proxy the year-specific effects of institutional reforms.

FIGURE 5.12b—SOURCES OF CHINA'S POVERTY REDUCTION



Source: Authors' construction based on data from Fan, Zhang, and Zhang (2004). Fan, Zhang, and Zhang (2004) estimated the effects of different categories of public investments on poverty and growth at the provincial level, using a simultaneous equations approach to account for the endogeneity of the variables affecting economic outcomes. Year dummies were used to proxy the year-specific effects of institutional reforms.

Note: The estimated impacts of reforms on poverty reduction are those arising from increased agricultural productivity; other possible avenues are not included.

on the ground. The renewed Malabo commitments and the next ten years of CAADP will be at the center of efforts to sustain and accelerate the recovery and further improve growth and poverty outcomes.

Empirical Analysis of Drivers of Growth in Africa

In the preceding sections, we have seen that Africa's growth recovery, although impressive, has still not been sufficient to put the continent back onto its growth trajectory of the 1960s. Signs of convergence between Africa and the rest of the world only begin to appear in the 2000s. It is clear that the recent growth recovery should be seen in relative terms; it is a welcome departure from the stagnation and decline of the preceding period, but in order to fully recover from its lost decades Africa must sustain and even accelerate growth.

In this section, we investigate the role of policy-related variables and other drivers of Africa's recent growth in order to identify the factors that governments should take into consideration when planning future growth strategies. We empirically test for the existence of growth convergence, both at the global level and among African countries. Evidence of convergence within Africa would indicate that the continent experienced broad, high-quality growth with a positive effect on poverty.

We apply the convergence model developed by Barro and Sala-i-Martin (2004), with the log of GDP per capita as the dependent variable. Using 1990 as the initial period, we compare Africa's experience to that of Latin America and the Caribbean and East Asia and the Pacific, as well as the world as a whole. The estimation captures how relative per capita GDP growth across countries in later years is affected by the initial level of per capita GDP in

1990, as well as other relevant variables. A positive and significant coefficient on the initial GDP per capita variable would indicate that countries with lower initial incomes experienced faster growth over the period than countries with higher initial incomes, and therefore that convergence took place.

The other variables selected are those likely to affect economic growth and the pace of convergence. The variables and data sources are detailed in Table 5.3. Relatively low and stable inflation is an important element of macroeconomic stability and represents an important pathway for macroeconomic reforms to positively affect growth. Data on inflation are from the IMF's World Economic Outlook database (IMF 2015) and show year-on-year percentage changes in average consumer prices. Savings, FDI, and official development assistance (ODA) are included to reflect the effects of the availability of financing for investment from these sources. Data on FDI and savings are from the World Bank's World Development Indicators (WDI) and are expressed as shares of GDP (World Bank 2015). Data on ODA are from the Organization for Economic Co-operation and Development (OECD) Creditor Reporting System and show gross disbursements of ODA to each recipient country in constant 2013 million US dollars (OECD 2015). We include three types of ODA, classified by sector. ODA 100 refers to ODA for "social infrastructure and services," including education, health, water and sanitation, and government and civil society. ODA 200 refers to ODA for "economic infrastructure and services," including transport and storage, communications, energy, banking and financial services, and business services. ODA 300 refers to ODA for "production sectors," including agriculture, industry, mining, construction, and trade. These three types of ODA represent 51.4 percent of the total ODA received by African countries during the period of analysis. We do not include other types of ODA, such as humanitarian aid, assistance to refugees in donor countries, administrative

costs of donors, general program assistance, and so on.

Variables from the World Bank’s Worldwide Governance Indicators (WGI) are added in order to examine how changes in different aspects of governance and institutional quality have affected growth. The WGI are expressed in standard normal units, with most values falling between -2.5 and 2.5 and higher values indicating better outcomes. Each indicator is constructed from multiple data sources and expresses the perceptions of households, firms, and other organizations regarding different areas of governance. The WGI we include are as follows:

- Voice and Accountability (VA) represents “perceptions of the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.”
- Government Effectiveness (GE) represents “perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.”

TABLE 5.3—VARIABLES INCLUDED IN THE ECONOMETRIC MODEL

Variable	Description	Source
Log GDP per capita	Log of GDP per capita, constant 2005 USD	World Bank (2015)
Log GDP per capita, 1990	Log of 1990 GDP per capita, constant 2005 USD	World Bank (2015)
Inflation	Inflation, average consumer prices, percent change	IMF (2015)
Savings	Gross domestic savings, percent of GDP	World Bank (2015)
FDI	Net inflows of foreign direct investment, percent of GDP	World Bank (2015)
ODA 100	ODA for social infrastructure and services (health, education, etc.), gross disbursements, million 2013 USD	OECD (2015)
ODA 200	ODA for economic infrastructure and services (transport and storage, communications, energy, etc.), gross disbursements, million 2013 USD	OECD (2015)
ODA 300	ODA for production sectors (agriculture, industry, mining, etc.), gross disbursements, million 2013 USD	OECD (2015)
Voice and Accountability (VA)	Perceptions of participation and freedom of expression and association, standard normal units	World Bank (2014b)
Government Effectiveness (GE)	Perceptions of the quality of public services and policymaking, standard normal units	World Bank (2014b)
Regulatory Quality (RQ)	Perceptions of the quality of regulations for private-sector development, standard normal units	World Bank (2014b)
Rule of Law (RL)	Perceptions of the quality of law enforcement and likelihood of crime, standard normal units	World Bank (2014b)
Control of Corruption (CC)	Perceptions of the absence of large- and small-scale corruption, standard normal units	World Bank (2014b)
Life expectancy	Life expectancy at birth	World Bank (2015)
Schooling	Average total years of schooling, population age 15 and over	Barro and Lee (2014)
Rain	Annual rainfall, mm	CRU and Harris (2014)
Natural resource export share	Share of fuel, ore, and mineral exports in total merchandise exports (percent)	World Bank (2015)
Manufacturing export share	Share of manufacturing exports in total merchandise exports (percent)	World Bank (2015)

Source: Authors.

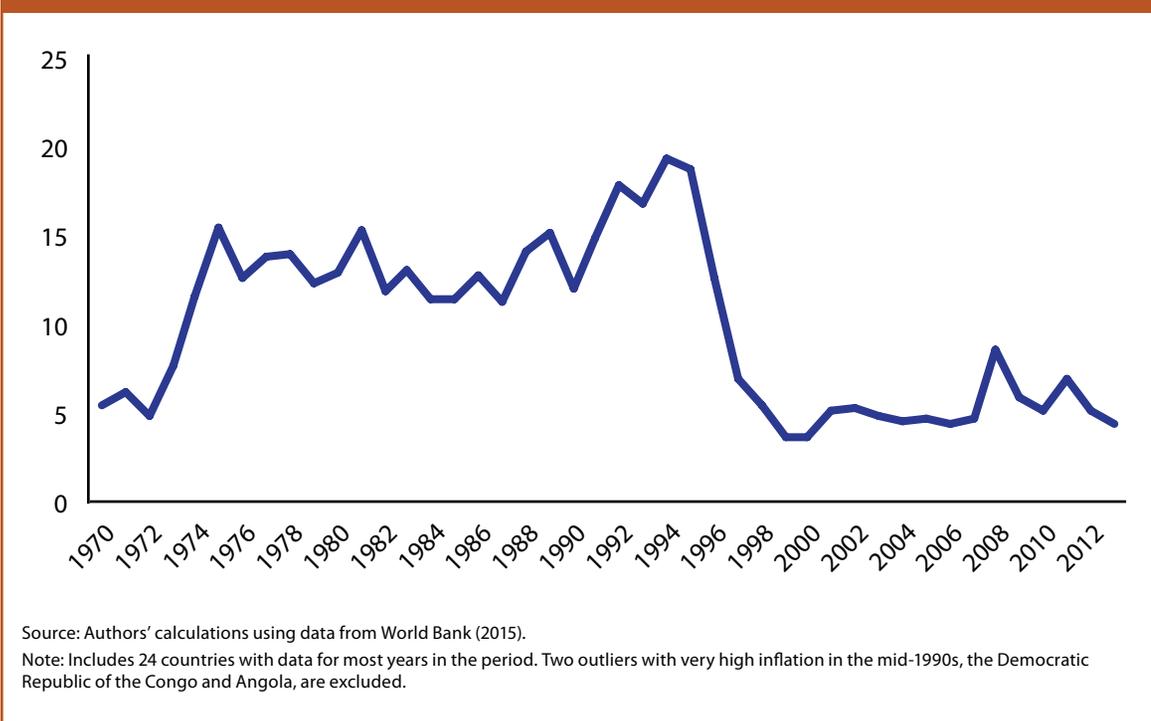
Note: CRU = University of East Anglia Climatic Research Unit; FDI = foreign direct investment; IMF = International Monetary Fund; ODA = official development assistance; OECD = Organization for Economic Co-operation and Development.

- Regulatory Quality (RQ) shows “perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.”
- Rule of Law (RL) shows “perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.”
- Control of Corruption (CC) shows “perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as ‘capture’ of the state by elites and private interests.” (Kaufmann, Kraay, and Mastruzzi 2010, 4)³⁷

We include variables representing human capital, with average life expectancy proxying general improvements in health, and average years of schooling capturing improvements in educational attainment. Data on these two indicators are from the World Bank WDI and from the Barro and Lee Educational Attainment dataset, respectively.

To examine the possible roles of exports and export composition in growth, and to explore the effects of reliance on natural resources, we use data from the World Bank WDI on natural resource exports (including oil and mining exports) as a share of merchandise exports and manufacturing exports as a share of merchandise exports. We also interact the natural resource export share with inflation to capture the effects of inflation associated with rapid rises in natural resource exports.

FIGURE 5.13—CONSUMER PRICE INFLATION, 1970–2013



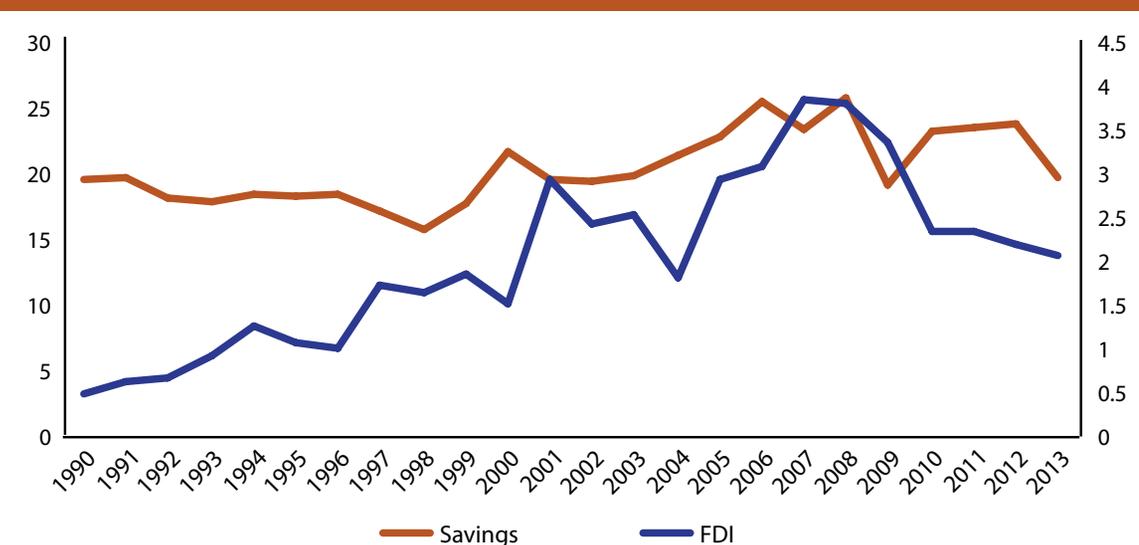
³⁷ We do not include the “political stability and absence of violence/terrorism” indicator, as this indicator expresses perceptions of likelihood of violence but does not accurately correspond to actual violence and instability.

Finally, we include data on rainfall from the University of East Anglia Climatic Research Unit (CRU), in recognition of the important role that climate can play in growth, particularly in economies where agriculture plays a prominent role.

Trends in Key Variables Affecting Growth

A look at the variables used shows that many factors have improved over time to boost the pace of growth among African economies. Inflation and other indicators of macroeconomic stability have improved markedly in the past several decades (Figure 5.13). This may be partially or largely the result of the reforms first implemented through the SAPs in the 1980s and 1990s. As far as financing is concerned, Figure 5.14 shows that savings as a share of GDP (measured on the left axis) declined during most of the 1990s but rose thereafter, albeit unevenly. The share of FDI in GDP (measured on the right axis) rose sharply throughout the 1990s and most of the 2000s, from less than 0.5 percent in 1990 to nearly 4 percent in 2007. Recently the FDI share has declined again in the aftermath of the global financial and commodity market crises, reaching 2.1 percent in 2013. ODA also rose significantly during the 2000s (Figure 5.15). Of the three types of ODA we examine, ODA for social

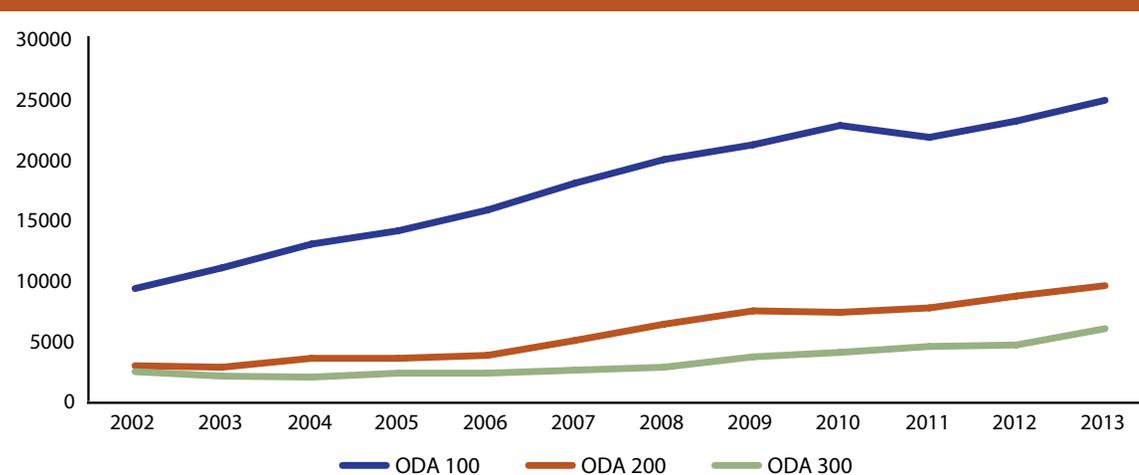
FIGURE 5.14—SAVINGS AND FOREIGN DIRECT INVESTMENT (FDI) AS A PERCENTAGE OF GDP, 1990–2013



Source: Authors' calculations using data from World Bank (2015).

Note: Savings as a percentage of GDP is shown on the left axis; FDI as a percentage of GDP is shown on the right axis.

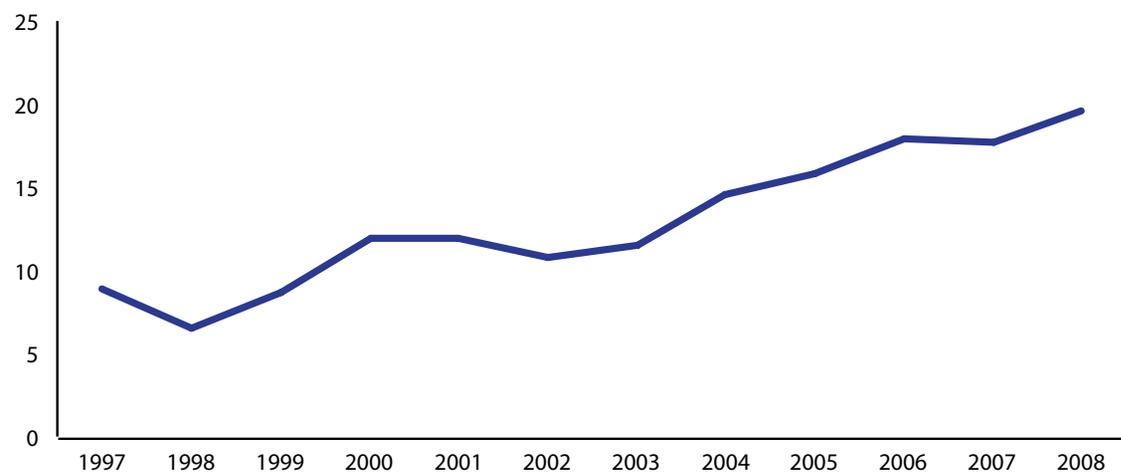
FIGURE 5.15—OFFICIAL DEVELOPMENT ASSISTANCE (ODA) DISBURSEMENTS TO AFRICA, 2002–2013



Source: Authors' calculations using data from OECD (2015).

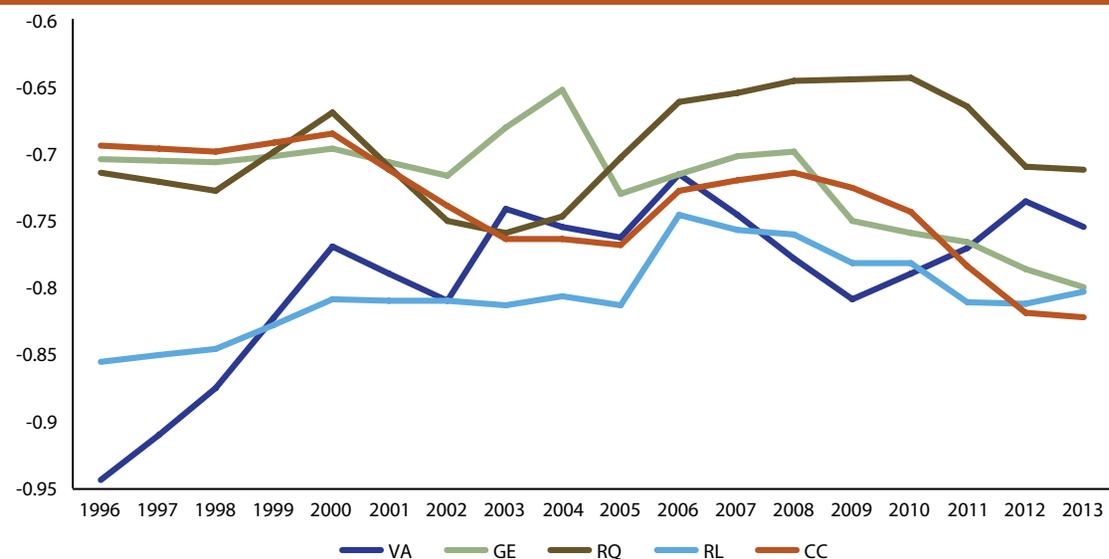
Note: ODA 100 refers to ODA for social infrastructure and services, ODA 200 is for economic infrastructure and services, and ODA 300 is for productions sectors.

FIGURE 5.16—NATURAL RESOURCE EXPORTS AS A SHARE OF GDP, 1997–2008



Source: Authors' calculations based on data from World Bank (2014a).

FIGURE 5.17—CHANGE IN GOVERNANCE INDICATORS, 1996–2013



Source: World Bank (2014b).

Note: Values represent average for African countries, weighted by population. CC = Control of Corruption; GE = Government Effectiveness; RL = Rule of Law; RQ = Regulatory Quality; VA = Voice and Accountability.

infrastructure and services started at the highest level in 2002 (the first year for which data are available) and more than doubled, to almost \$25 billion by 2013. The other two types of ODA also increased considerably, more than tripling in the case of economic infrastructure and services. A final indicator of the additional revenues available to African countries during the recovery period is the share of natural resource exports in GDP (Figure 5.16). This share also increased sharply during the 2000s, rising from an average of 9 percent in 1997 to almost 20 percent in 2008. Governance indicators improved, but not markedly, over the late 1990s and 2000s (Figure 5.17). The Government Effectiveness (GE) and Control of Corruption (CC) indicators fell slightly over the period. The Rule of Law (RL) and particularly the Voice and Accountability (VA) indicators ended the period at higher values than initially, but rose and fell slightly several times. The Regulatory Quality (RQ) indicator also rose and fell several times and ended the period at a level similar to the initial level.

Empirical Findings

The results of our analysis are presented in Table 5.4. They indicate that significant convergence took place when the role of policy-related and other variables is taken into consideration.

TABLE 5.4— ESTIMATION RESULTS

	Africa	LAC	EAP	SA	World
Variables	<i>Dependent variable: Log GDP per capita (1990–2013)</i>				
Log GDP per capita, 1990	-0.00516*** (0.00168)	-0.01842*** (0.00403)	-0.01500 (0.02005)	-0.00289 (0.00540)	-0.00935*** (0.00143)
Inflation	-0.00011*** (0.00004)	-0.00011* (0.00005)	0.00045** (0.00017)	-0.00020 (0.00018)	-0.00003 (0.00003)
Savings	0.00005* (0.00003)	0.00019*** (0.00005)	0.00025*** (0.00008)	0.00054** (0.00023)	0.00012*** (0.00003)
ODA 100 (Social)	0.00501*** (0.00152)	0.00099 (0.00328)	-0.00085 (0.00233)	0.00691*** (0.00164)	0.00459*** (0.00113)
ODA 200 (Economic)	0.01285*** (0.00205)	-0.00558* (0.00379)	-0.00048 (0.00172)	0.01400*** (0.00340)	0.00286*** (0.00092)
ODA 300 (Production)	0.00514** (0.00247)	0.00049 (0.00427)	-0.02004*** (0.00716)	-0.01933*** (0.00534)	-0.00200 (0.00248)
FDI	0.00009** (0.00004)	0.00019** (0.00010)	0.00031** (0.00018)	0.00004 (0.00073)	0.00010** (0.00005)
VA	-0.00084 (0.00098)	0.00370 (0.00202)	0.00363** (0.00263)	0.00523 (0.00323)	-0.00094 (0.00097)
GE	0.00024 (0.00151)	0.00073 (0.00188)	0.00623 (0.00371)	0.01056* (0.00618)	0.00378*** (0.00129)
RQ	0.00051 (0.00123)	0.00190 (0.00148)	0.00103 (0.00332)	0.00169 (0.00454)	0.00278** (0.00109)
RL	0.00296** (0.00138)	0.00100 (0.00184)	0.00603*** (0.00302)	-0.01317*** (0.00452)	-0.00178 (0.00115)
CC	0.00373*** (0.00111)	0.00128 (0.00159)	-0.00038 (0.00257)	0.01025*** (0.00359)	0.00172* (0.00101)

	Africa	LAC	EAP	SA	World
Variables	<i>Dependent variable: Log GDP per capita (1990–2013)</i>				
Life expectancy	0.00022** (0.00009)	0.00395*** (0.00034)	0.01195*** (0.00092)	0.00383*** (0.00079)	0.00078*** (0.00010)
Schooling	0.00269*** (0.00040)	0.00157** (0.00061)	-0.00362*** (0.00094)	-0.00268 (0.00195)	0.00374*** (0.00034)
Rain	-1.41E-06 (1.37E-06)	-1.44E-06** (7.07E-07)	1.27E-06 (1.84E-06)	-9.94E-07 (1.29E-06)	-1.30E-06* (7.12E-07)
Resource export share	3.74E-06 (0.00002)	-0.00003 (0.00003)	-0.00020*** (0.00010)	-0.00071* (0.00040)	0.00003* (0.00002)
Inflation* resource share	3.68E-06** (1.46E-06)	3.91E-06** (1.58E-06)	-1.79E-06 (5.02E-06)	0.00005 (3.01E-05)	3.80E-07 (8.99E-07)
Manufacturing export share	7.39E-07 (0.00002)	5.19E-06 (0.00002)	0.00012 (0.00006)	-0.00018 (0.00013)	-0.00002 (0.00002)
Constant	0.01538 (0.01156)	-0.14140*** (0.03528)	-0.68895*** (0.15296)	-0.19496*** (0.06188)	-0.00055 (0.01189)
Observations	331	235	94	51	830.0
χ^2 (18)	443.1	992.7	640.6	895.0	1056.6
Log likelihood	1420.9	209.3	387.7	237.2	3261.1

Source: Authors' estimation results.

Notes: *** significant at 0.01 level; ** significant at 0.05 level; * significant at 0.10 level. Standard errors given in parentheses.

CC = Control of Corruption; EAP = East Asia and the Pacific; FDI = foreign direct investment; GE = Government Effectiveness; LAC = Latin America and the Caribbean; ODA = official development assistance; RL = Rule of Law; RQ = Regulatory Quality; SA = South Asia; VA = Voice and Accountability.

Countries with lower initial levels of per capita GDP grew faster, indicating that lagging economies began to catch up with leading economies. The growth recovery in Africa has therefore been effective at raising incomes in the poorest countries. Evidence of convergence was also found in the world as a whole and in Latin America and the Caribbean, but at faster rates than in Africa: 5.1 percent, 6.0 percent, and 4.7 percent for the world, Latin America and the Caribbean, and Africa, respectively. This estimation analyzes convergence over the 1990–2013 period. Results using 2000 as the starting year are similar (not shown).

As shown in the table, convergence is affected by a host of variables, in addition to the initial level of GDP per capita. Inflation, for instance, was found to negatively affect per capita GDP growth in Africa, while ODA and the shares of FDI and savings as a percentage of GDP had a positive effect. The more moderate levels of inflation and overall improved macroeconomic stability clearly did contribute to Africa's growth recovery, suggesting that SAPs may have produced positive growth effects but with a significant time lag (Badiane and Makombe 2015). The effect of savings was positive and significant. However, both the significance and the magnitude were lower in Africa than in the other regions and in the world as a whole. Africa's average share of savings in GDP was lower than that of the other regions. The effect of FDI in Africa was larger and more significant than that of savings but was still lower than that in most other regions and the world as a whole. Despite the rapid rise in FDI in Africa over the period, average levels remained lower than those of most other regions; FDI may prove to have a larger effect on economic growth as levels increase to match those of other developing regions. The effects of FDI, as well as of ODA, also depend on other factors, including institutional quality and human capital levels in the receiving country.

All three types of ODA examined have had a significant positive effect on growth, particularly the “economic infrastructure and services” category. This category includes much of what is commonly referred to as infrastructure, such as transport, storage, and communications, as well as financial and other business services. Disbursements of each type of ODA increased considerably throughout the recovery period, but the amount of ODA for social infrastructure and services (including health, education, etc.) was consistently two to three times that of ODA for economic infrastructure.

All types of ODA were either insignificant or significant and negative for most of the other regions. For South Asia and for the world as a whole, the first two types of ODA show a significantly positive effect on growth. Although there has been controversy over the effects of aid on economic growth, with many studies unable to find a positive relationship, the revised analysis of several previous studies performed by Clemens et al. (2012) indicates that aid does have a modest positive effect on growth on average, although effects differ by country. Our analysis suggests that Africa is a region in which aid has had, at least in the past decade, better-than-average growth impact.

The governance and institutional quality variables and the human capital variables represent what Rodrik (2013a) calls “fundamental capabilities,” or characteristics that can drive sustained, but not necessarily rapid, economic growth. The human capital variables, life expectancy and average years of schooling, both positively affected growth among African countries. Both human capital variables also had a positive and significant effect on growth in every region and in the world as a whole (with the exception that schooling appears as negative and significant in the East Asia and the Pacific region, and as not significant in South Asia).

Improvements in two of the governance variables, Rule of Law and Control of Corruption, positively affected growth in African countries, while three other variables, Government Effectiveness, Regulatory Quality, and Voice and Accountability, were found to have no significant impact on growth. There is a wide consensus that good governance in general and the related concepts of rule of law and control of corruption in particular are vital for economic growth (see, for example, Ugur and Dasgupta [2011] for a review of evidence on corruption and growth). It is interesting that even the limited progress that has been made in these areas appears to have had a positive effect on growth in Africa. As shown in Figure 5.17, the Rule of Law indicator improved only slightly over the period and the Control of Corruption indicator even trended downward toward the end of the period. For the world as a whole, Control of Corruption, Regulatory Quality, and Government Effectiveness were similarly positive and significant. Consequently, the deepening of reforms in the area of political governance must be a critical component of future strategies to foster long-term growth, create employment, and raise incomes.

The effect of natural resource exports, as a share of total merchandise exports, is positive but insignificant. However, the effect becomes positive and significant when the natural resources export share is interacted with inflation. This growth-enhancing effect could arise through two channels. First, increased export revenues, if properly managed, have the same impact as increases in savings, FDI, or ODA, as they improve the country's capacity to finance investments, including the importation of capital goods, which boosts productivity and growth. Second, increased export revenues, through the impact on the balance of payments and improved access to foreign exchange reserves, tend to help stabilize country exchange rates, with associated improvements in the macroeconomic environment for growth.

Natural-resource-dependent economies have historically struggled to neutralize the inflation-inducing effects of surges on export revenues. The positive effect above appears to suggest that during the recovery period, the negative effects of inflation on growth were less severe in natural-resource-dependent countries than in others. Countries seem to have had greater success than in the past in adequately managing natural resource export earnings such as to avoid their destabilizing macroeconomic impacts. The negative effects of inflation in natural-resource-dependent countries may have been partially offset by other positive effects of increased export revenues on growth.

Although inflationary pressures can stem from an increased influx of foreign exchange revenues during natural resource export booms, they can also stem from other factors related to fiscal and monetary management. As was seen in Figure 5.13 on page 98, inflation has been lower across the continent in the 2000s than in the two preceding decades. The macroeconomic reforms enacted during the SAP era may have softened the inflationary tendencies of rising natural resource export earnings during the 1990s and 2000s. Indeed, African countries with a high natural resource value-added share (>10 percent) appear to have been effective in managing resource revenues such as to avoid their growth-reducing inflationary effects. As can be seen from Figure 5.18 (next page), relatively resource-dependent countries experienced higher inflation than others during the late 1990s, but by the mid-2000s they had brought inflation down to levels similar to those of non-resource-dependent countries. The graph begins in 1997 because Angola and the Democratic Republic of the Congo, two natural-resource-dependent countries, had extremely high inflation rates that are difficult to show on the graph. If those two countries are excluded, natural-resource-dependent countries still show higher

inflation rates than non-natural-resource-dependent countries during the early and mid-1990s, and rates start to converge by the late 1990s.

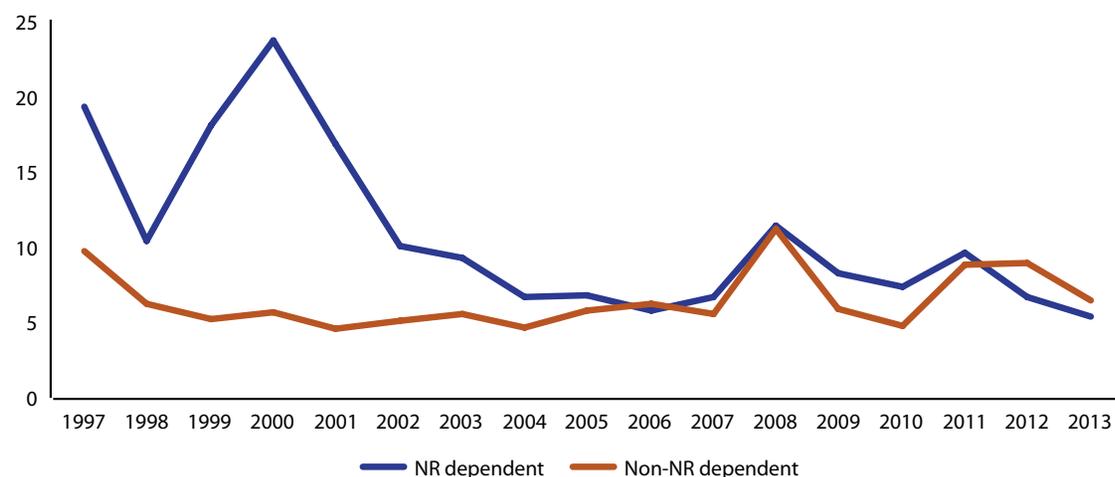
The successful management of natural resource revenues suggested by our results is a welcome contrast to the experiences of many resource-rich African countries during the 1970s and 1980s. A large volume of natural resource exports exposes the economy to the risk of Dutch disease, due to the shift in relative prices in favor of nontradable sectors, which in turn results in the contraction of activities in the nonresource tradable sectors, including manufacturing and agriculture. For instance, in Nigeria, the effects of oil price booms as well as government policies that were biased against agriculture helped turn the country from a major agricultural

exporter in the 1960s into a large-scale food importer during the 1970s (Oyejide 1986). The volatility in public expenditures and relative prices that is associated with natural resources boom and bust cycles also creates uncertainty and thus disincentives for investment, which in turn has a negative effect on growth (Budina, Pang, and van Wijnbergen 2007).

In the last decade, ever more African countries have joined the ranks of oil and mineral producers. Managing revenues prudently to harness their potential for catalyzing growth while avoiding their possible negative effects on other sectors will be a key challenge in the future management of growth. Public spending and investment may be the most effective tool the government has to counter Dutch disease effects that tend to harm

agriculture and manufacturing (Scherr 1989). However, the effectiveness of public spending tends to decline at high levels of expenditure (Gelb and Grasmann 2010). Indeed, Nigeria accumulated high debts during the 1980s despite its oil revenues, in part because public investment projects were often unsuccessful and failed to generate sufficient revenues (Budina, Pang, and van Wijnbergen 2007). More recently, Ghana, in the aftermath of surging oil exports, raised domestic spending significantly, leading to serious macroeconomic problems (IFEJ 2015). Similar developments are documented by Tshibaka (1986) in the case of the Democratic Republic of the Congo. Gabon provides another example of a country where large and rising natural resources

FIGURE 5.18—CONSUMER PRICE INFLATION, NATURAL-RESOURCE-DEPENDENT AND NON-RESOURCE-DEPENDENT COUNTRIES



Source: Authors' calculations based on World Bank (2015) and UNSD (2015).

Note: NR = natural resource. "NR dependent" countries are those with mining and utilities value-added shares of over 10 percent, according to the United Nations Statistics Division. Inflation is weighted by GDP.

revenues have failed to generate meaningful overall economic growth or tangible progress in poverty reduction in the past. Strengthening public financial management systems to enable them to handle the increased spending resulting from resource revenues will be another critical component of future strategies for growth with employment generation (IMF 2007). Processes for investment project identification, selection, and implementation will also need to be enhanced in order to improve the quality and impact of public expenditures in resource-rich countries (Budina, Pang, and van Wijnbergen 2007). As a general rule, Gelb and Grasmann (2010) recommend a cautious fiscal policy, as the negative welfare effects of overestimating future revenues and overspending far outweigh the costs of overcaution and underspending.

Despite the importance of vigilance to ensure proper resource management in the years ahead, the role of natural resources in Africa's recent growth should not be overstated. Both resource-rich and non-resource-rich countries were among the best growth performers in recent years, and both groups were also represented among slower-growing countries, as shown in the paper by Badiane and McMillan. In other words, sustaining and accelerating the current recovery process to boost employment and incomes will require improvements in all the areas discussed above: political governance, human resources, and the macroeconomic environment.

Conclusions

In this chapter we have reviewed Africa's unprecedented growth recovery and examined the roles of policy-related factors and other drivers. Africa's growth in the decade of the 2000s was the most rapid the continent has

seen in the past five decades and followed several decades of stagnation and even decline in per capita GDP. Similar patterns are seen in overall labor productivity and in agricultural labor productivity, a key factor for increasing rural incomes.

The current growth recovery is promising, but the struggle to increase living standards is far from over. The recent growth acceleration has not been sufficient to put the continent back onto its growth path of the 1960s; Africa remains far below the levels of GDP per capita and agricultural labor productivity that it would have reached today had it avoided the lost decades and maintained the growth rates of the 1960s. In fact, many African countries have not yet matched the absolute levels of GDP per capita and agricultural productivity that they displayed in earlier decades.

Signs of economic convergence between Africa and the rest of the world are discernable starting in the 2000s, but no such convergence appears in agricultural labor productivity, where the gap between low-productivity and high-productivity countries continues to widen. To speed up the pace of catching up and allow Africa to harness growth to maximize impact on poverty, efforts must be made to raise agricultural productivity and growth in order to sustain and even accelerate the recovery.

The evolution of growth policies and strategies among African countries since independence offers valuable lessons for the future, in particular when compared with the experience of China, which was poorer than Africa during the 1960s and 1970s but which embarked on an exceptionally rapid growth trajectory starting in the late 1970s. Over the past five decades, many African countries pursued policies based on successive waves of shifting paradigms, with abrupt and frequent changes in focus between industry and agriculture and between government and the private sector. China, by

contrast, followed a reform process that was carried out gradually and in incremental steps, based on evidence from small-scale experiments. This approach allowed China to sustain rapid growth for several decades and lift unprecedented numbers of people out of poverty.

As much as the shifting development strategies pursued by African countries failed to result in sustained growth for decades, subsequent improvements in policies and governance paved the way for broad-based growth across the continent. Key drivers explaining Africa's growth recovery include increases in savings, FDI, and ODA; improvements in education and life expectancy; improvements in the rule of law and control of corruption; and increasing macroeconomic stability. The results also suggest that natural-resource-dependent countries have been able to manage foreign exchange revenues adequately to prevent negative

macroeconomic effects. Given the large and increasing numbers of countries in Africa now producing oil or minerals, prudent management of natural resource revenues will be essential in the coming decades if countries are to avoid repeating earlier mistakes and put revenues to work to spur more broad-based growth.

The empirical analysis also shows that during the recovery period, convergence took place among African countries as well as in the world as a whole, indicating that growth was successful in raising incomes in the poorest countries. Of concern is, however, the absence of convergence in terms of agricultural labor productivity between Africa and the rest of the world. On the contrary, the productivity gap between Africa and other regions appears to be widening, which again highlights the critical importance of a continued successful implementation of CAADP.



CHAPTER 6

Economic Transformation in Africa: Patterns, Drivers, and Implications for Future Growth Strategies

Ousmane Badiane and Margaret McMillan

Introduction

African countries have been undergoing a remarkable agricultural and economic recovery since the mid-1990s. Average growth rates for the agriculture sector and the overall economy have been hovering around 5–6 percent. Even during the recent crises in global food and financial markets, African economies have maintained positive and relatively strong growth rates. More strikingly, the growth recovery has not only accelerated, it has also spread broadly across all major regions of the continent (Badiane and Collins, forthcoming). Africa's recent performance is taking place in the aftermath of low economic growth and stagnation during most of the preceding decades.

How to sustain and accelerate the current growth recovery is the most important strategic development question facing African countries today. The answer requires a closer look at the process of economic transformation and its underlying factors. It also calls for a better understanding of the structural consequences of the decades-long stagnation of economies across the continent and how it may have affected growth fundamentals—in particular, the potential roles of respective sectors in future growth trajectories.

This chapter takes a comprehensive look at the process of structural transformation among African countries, highlights the major shift that has taken place in terms of the contribution of structural change to growth in the last decade, and examines in depth changes in the productivity of and employment within different economic sectors and their implications for future growth. An important part of this analysis addresses the emerging place and role in future growth processes of the informal goods and services sector, which is now the largest economic sector in most African countries,

in addition to the agriculture and manufacturing sectors, which have been the focus of traditional growth theory.

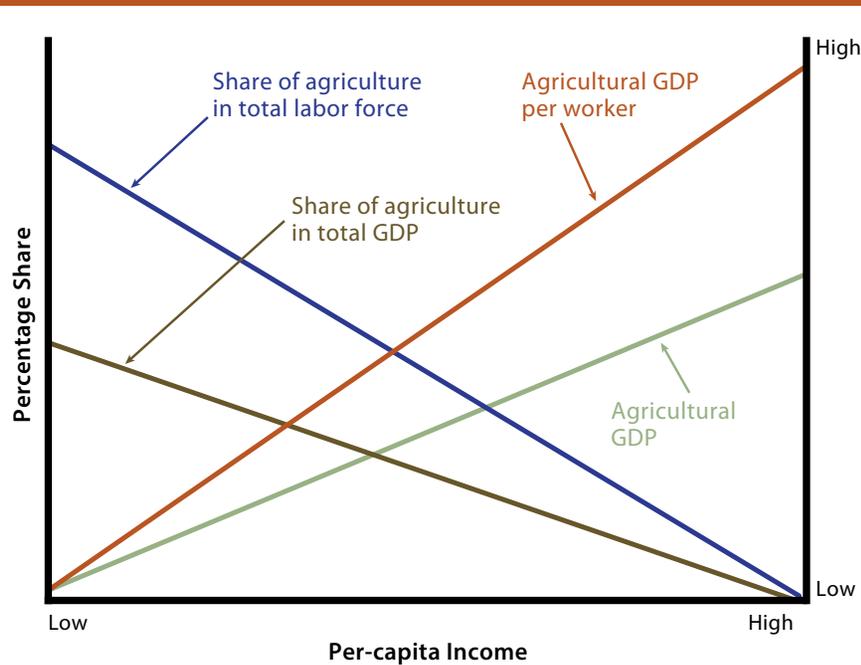
Section 2 reviews the process of structural transformation, the role of the agriculture sector therein, and its patterns among African countries since the 1980s, the period for which data are available for a critical mass of countries. Section 3 compares the performance of African countries with that of other developing regions, focusing particularly on the post-recovery period. Section 4 analyzes the past and future implications of structural change dynamics for sectoral growth and poverty reduction. Section 5 discusses the scope and options for an industrial development policy targeting the informal goods and services sector, as a component of future strategies to foster growth with broad based employment and wealth creation. Section 6 focuses in the need to promote innovation, growth, and employment in the informal goods and services sector, and the final section presents conclusions from key findings.

*Process and Pattern of Structural Transformation*³⁸

Traditional growth theory explains wealth creation as a structural transformation process. Countries create wealth and become rich during the process of economic growth by producing more of the same good per unit of time and, more important, a larger basket of higher-valued goods. During the process, the economy moves from a status where most economic activities are concentrated in agriculture and rural areas to a situation where industrial and other urban-based activities become dominant. Figure 6.1

³⁸ This section is based on Badiane (2014).

FIGURE 6.1—THE ROLE OF AGRICULTURE IN THE ECONOMIC TRANSFORMATION PROCESS



Source: Based on Timmer (2009).

summarizes these changes. Managing a successful economic transformation poses two key challenges: (1) raising labor productivity sustainably in the agriculture sector and the rural economy, while (2) diversifying into higher-valued goods outside agriculture in emerging higher-productivity, urban-based manufacturing and services sectors. When these challenges are met, overall labor productivity and incomes rise due both to increases in within-sector productivity as well as to the reallocation of labor to more productive sectors (structural transformation).

The Role of Agriculture

The role of agriculture in the transformation process is related to the changes reflected in Figure 6.1. As the economy grows, the levels of output and productivity per worker in the agriculture sector rise, while the sector's shares in total labor force and overall output decline gradually due to faster growth in the rest of the economy. The result is a rise in per capita income levels. Despite its relative decline, the agriculture sector plays a significant role in the economic transformation process, as summarized by Johnston and Mellor (1961). As per capita incomes and population grow, the expanding agriculture sector provides greater food supplies from domestic production or through imports paid for by foreign exchange earned from agricultural exports. The increase in food supplies stabilizes prices and prevents real wages in the nascent industrial sector from rising too fast.

Agriculture plays another important role as a main source of fiscal revenue for financing road and power infrastructure, health, education, and other investments needed to stimulate growth in the rest of the economy. Finally, and more importantly, agriculture generates a large share of the income that fuels demand for services as well as goods produced in the emerging manufacturing sector. When agriculture grows and all the above linkages function properly, labor is released from the agriculture sector to meet demand for manpower in the expanding and higher-productivity manufacturing sector. The migration of labor out of a growing agriculture sector also raises productivity in that sector. As a result, average productivity in the economy rises along with per capita incomes.

Difficulties experienced by African economies following independence arise from the complexity of designing appropriate strategies to exploit these various contributions effectively. This outcome arises because the

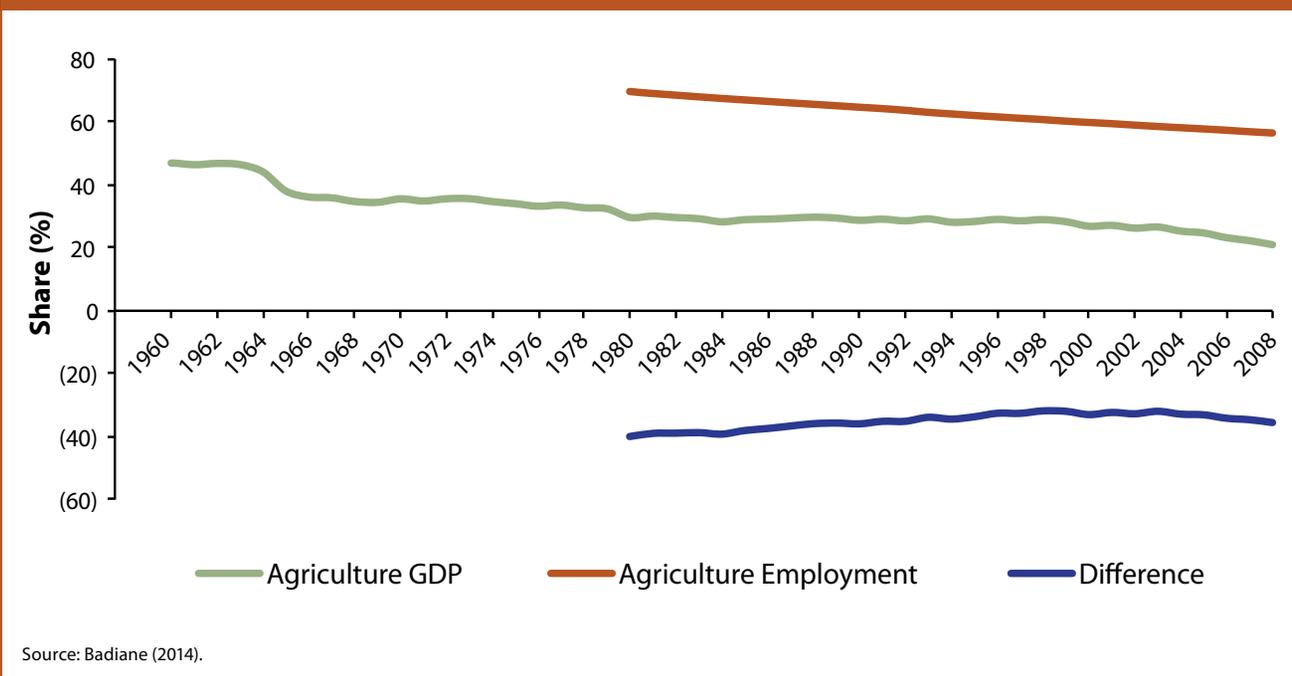
contributions are not straightforward and may conflict with one another, as well as with other goals outside agriculture. For instance, the need to raise foreign exchange revenues may conflict with the need to expand domestic food supplies—both with the goal of generating sufficient fiscal revenues to finance capital goods. The latter may in turn conflict with the need to raise incentives and stimulate growth within the agriculture sector.

Another source of complexity in managing the contribution of agriculture to the growth process emanates sometimes from a misunderstanding of its role in that process. A historical review of the growth performance of the agriculture sector reveals that even if the most labor-intensive techniques are used, the achievable rate of agricultural growth is unlikely to be high enough to absorb the growing labor force (Mellor 1986). Analysis of industrialization by Syrquin (1989) in 100 countries has shown that the growth rate of value-added to and input use in agriculture is about 40–50 percent less than in manufacturing. While this finding underlines the fact that progressive industrialization is the engine for sustained long-term growth, many development policy practitioners and analysts during the time of independence for African

countries in the late 1950s and early 1960s failed to recognize the centrality of agriculture in stimulating growth in the industrial sector itself.

Increases in agricultural productivity are the essential first element in the process of structural transformation, with growth resulting in rising rural incomes which in turn lead to increased demand for manufactured goods and services and increased employment and production in non-agriculture. However, in the decades after independence, industrial and trade policies in many African countries, as in many other parts of the developing world, effectively disincentivized agricultural production,

FIGURE 6.2—CHANGES IN AGRICULTURAL GDP AND EMPLOYMENT SHARES AMONG AFRICAN COUNTRIES, 1960–2008



resulting in stagnating agricultural sectors that failed to provide rising incomes and stimulate overall economic growth (Schiff and Valdes, 1992). The policy choices of the last five decades are discussed in more detail in chapter 5 of this report. Here, we describe the particular patterns of structural change in Africa that resulted from these policies, and the evolution of structural change over time.

Trends in Sectoral Productivity and Employment

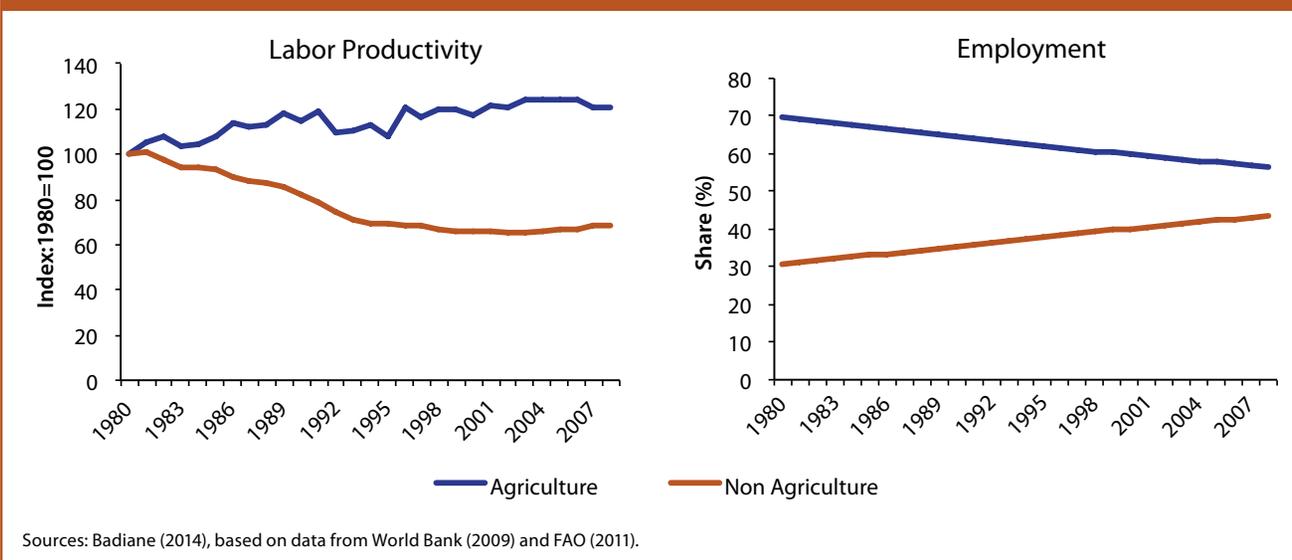
In line with the process described in Figure 6.1, this section starts the analysis of structural transformation patterns among African countries with a review of the extent to which trends in output and employment shares of the agriculture sector are converging as they decline. Through this convergence the levels of incomes in the agriculture and rural sectors rise gradually toward average income levels. The degree of convergence is reflected in the declining distance between the productivity and employment lines illustrated in Figure 6.2.

Given the scarcity of employment data, particularly for periods earlier than the 1980s, the analysis in this section is based on agriculture's share of the economically active population (FAO 2011). Later analysis of the patterns of structural change during the

post-recovery period uses sector employment data from the Groningen Growth and Development Centre (GGDC 2013) and Africa Sector Database (ASD).³⁹ The share of agricultural value-added in total gross domestic product (GDP) is used as a measure for agricultural GDP share.

A look at trends in the shares of the agriculture sector in overall GDP and employment reveals the economic challenges faced by African countries before the recent turnaround. The flat slope of the bottom line in Figure 6.2, which plots the difference between the two shares, is reflective of the slow pace of structural change that has characterized African economies compared to the trajectories of countries that have transformed more successfully, as shown in Timmer (2009). Successful structural change would have gradually narrowed

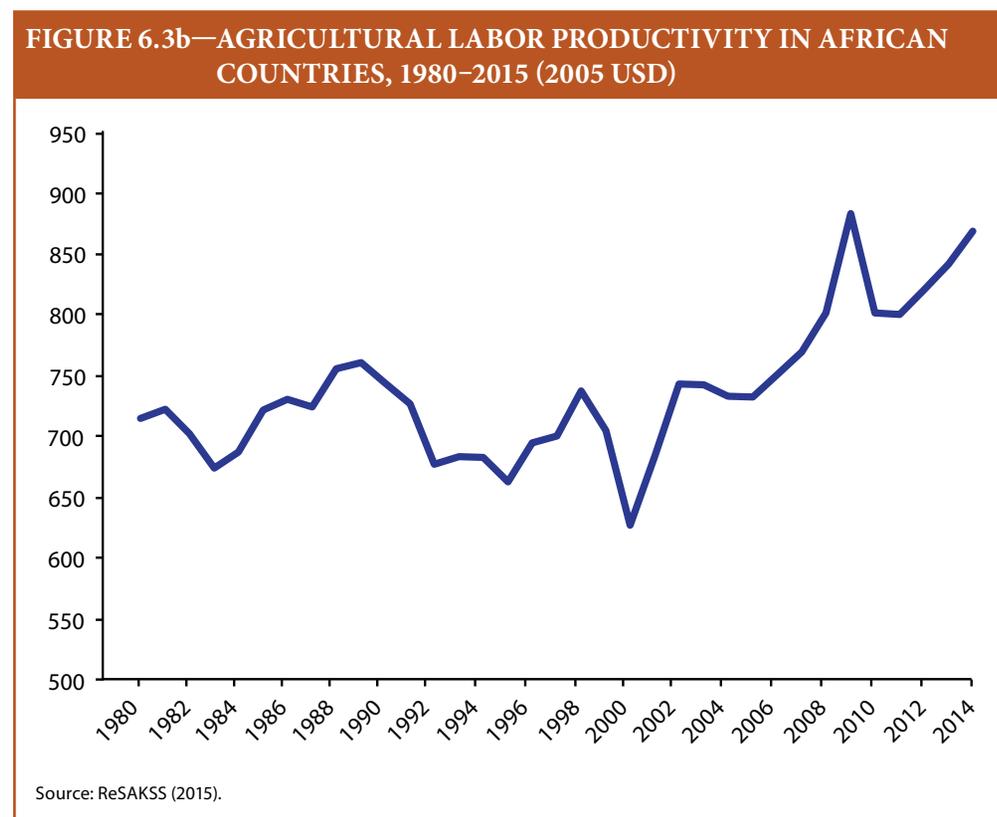
FIGURE 6.3a—TRENDS IN LABOR PRODUCTIVITY AND EMPLOYMENT SHARE AMONG AFRICAN COUNTRIES, 1980–2008



³⁹ Both sets of data are available from the GGDC website (www.rug.nl).

the difference between the agricultural shares of GDP and employment, and thereby gradually raised incomes in the agriculture and rural sectors toward the level of incomes in the urban and industrial sectors. This process of convergence takes a long time, as illustrated by Timmer (2009), but at least a gradual decline in the gap and a steady upward slope of the bottom line over the nearly 30-year period covered by the analysis should have been feasible.

As shown in Figure 6.3a, labor productivity in agriculture has stagnated despite a rapid decline in the employment share, which explains the rapid



decline in the agricultural GDP share. In contrast, the non-agriculture sector displays steadily falling trends in productivity throughout the 1980s and 1990s, combined with a rising employment share. As a result of these different trends, the pace of labor migration out of the stagnating agricultural and rural economy exceeded the pace of growth in the non-agriculture sector. The consequence has been a process of structural transformation that reduced rather than boosted growth, as documented in detail in McMillan and Rodrik (2011) and Badiane (2011). The problem

then was as much one of no growth in agriculture as one of an inadequate pace of labor absorption outside agriculture.

The picture improved considerably over the last 10–15 years, when general economic performance started to pick up rapidly, including in the agricultural sector, where labor productivity made a progressive upward turn since the early 2000s (see Figure 6.3b). The nature and quality of structural change during this period are evaluated in the next section, by comparing the performance of African countries with that of countries in other developing regions.

Structural Transformation in Africa and Other Developing Regions⁴⁰

This section examines in detail the evolution of the distribution of employment among sectors across levels of income experienced in Africa, and how it compares with the patterns seen historically in other regions of the world over the course of development. Using

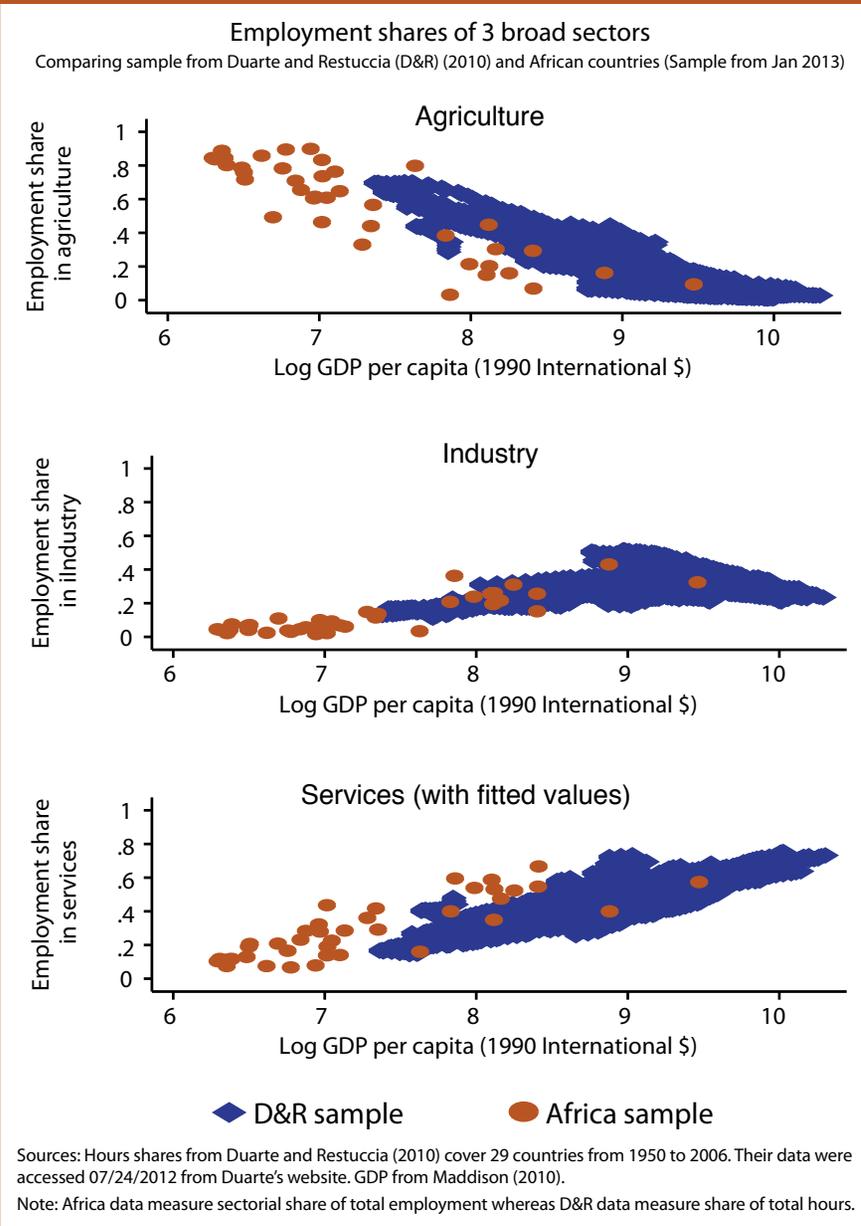
⁴⁰ The analysis in this section and Section 4 is based on McMillan and Harttgen (2014).

the patterns seen in other regions historically as a baseline can help to gauge the extent to which structural change in Africa compares with what would be “expected” based on its income levels. To this end and following Duarte and Restuccia (2010), this section starts by aggregating the nine sectors in the database into agriculture, industry and services” by adding manufacturing, mining, construction, and public utilities to create “industry”; adding wholesale and retail trade, transport and communication, finance and business services, and community, social, personal, and government services to create “services”; and leaving “agriculture” as is.⁴¹ The measure of “development” is log GDP per capita in international dollars from Maddison (2010).

Figure 6.4 plots employment shares in agriculture, industry, and services on the y-axis and log GDP per capita on the x-axis for 19 African countries for which data were available for the years 1990 and 2005. The African countries are compared with the sample of 29 Latin American, North American, European, Asian, and Pacific countries examined by Duarte and Restuccia (2010). For Africa, as for the comparator group of countries, agriculture decreases, and the share of employment in services and manufacturing increases, monotonically with income. Therefore, the recent patterns of structural change in Africa are similar to historical patterns observed in other regions.

Sector productivity differentials in Africa also resemble those in other regions. According to estimates by McMillan and Harttgen (2014), productivity in the agriculture sector in 2005 stood at 36 percent of average productivity in African economies, compared with manufacturing productivity at two times the average. Trade, wholesale and retail, and other services excluding transport showed productivity levels around the average.

FIGURE 6.4—CHANGES IN SECTORAL EMPLOYMENT SHARES



⁴¹ This aggregation is consistent with that used in Duarte and Restuccia (2010), who also use the GGDC database (along with other sources) to construct their dataset.

These differences suggest that labor flow in the last decade may have had a more positive impact on growth.

From these figures, it appears that the potential for continued reallocation of labor from low- to high-productivity sectors to increase growth remains quite large. Sustaining and deepening the recent recovery process should have a significant impact on income growth and wealth creation in the coming years. The reverse of the argument should mean that failure to do so—for instance, by undoing the positive changes in policy and investment that have induced the recovery in the first place—would have dramatic consequences in terms of growth and poverty reduction.

Our preliminary analysis reveals that, although structural change might have been delayed in much of Africa during earlier decades, the continent may have taken a turn and is now on the same trajectory as observed historically in other regions. The following paragraphs investigate in more depth the nature of structural change in Africa from 2000 to 2010.

Measuring Structural Change

Labor productivity growth can be achieved in one of two ways. First, productivity can grow within existing economic activities through capital accumulation or technological change. Second, labor can move from low-productivity to high-productivity activities, increasing overall labor productivity in the economy. This can be expressed using the following decomposition:

$$(1) \quad \Delta P_t = \sum_{i=n} \theta_{i,t-k} \Delta p_{i,t} + \sum_{i=n} p_{i,t} \Delta \theta_{i,t}$$

where P_t and $P_{i,t}$ refer to economy-wide and sectoral labor productivity levels, respectively, and $\theta_{i,t}$ is the share of employment in sector i . The Δ operator denotes the change in productivity or employment shares between $t-k$ and t . The first term in the decomposition is the weighted sum of productivity growth within individual sectors, where the weights are the employment share of each sector at the beginning of the time period. Following McMillan and Rodrik (2011), this is called the “within” component of productivity growth. The second term captures the productivity effect of labor reallocations across different sectors, which is labeled “structural change.” When changes in employment shares are positively correlated with productivity levels, this term will be positive, and structural change will increase economy-wide productivity growth.

The above decomposition can be used to study broad patterns of structural change within a country and across countries. Individual components of the decomposition, such as labor shares, and within sector changes in productivity can also be used at the country level to dig deeper into where structural change is or is not taking place and to gain a deeper understanding of the country-specific factors that drive structural change. For example, if it is known that the expansion of manufacturing is a characteristic of structural change in a particular country, more detailed data on manufacturing could be used to pinpoint which specific industries expanded, how many people were employed, and whether specific events or policies contributed to the expansion or contraction of a particular sector.

Data on value-added and employment shares for African countries were assembled using the methodology developed by researchers at GGDC.⁴² Measures of sectoral and aggregate value-added came from national

⁴² Since performing the analysis in this chapter, McMillan received a grant from the United Kingdom’s Economic and Social Research Council that helped fund the Africa Sector Database (ASD). The ASD contains value-added and employment for 11 African countries for the period 1960–2010 and is publicly available on GGDC’s website.

accounts from respective national statistics offices whenever possible, and were complemented with the United Nation's national accounts whenever national sources were incomplete or found to be inconsistent. Population censuses were used to measure sectoral-level employment. When census data were not available, labor force surveys and household surveys were used following Timmer and de Vries (2007, 2009). The analysis was restricted to the following four sectors: (1) agriculture, hunting, forestry, and fishing; (2) mining and quarrying (note that mining includes all natural resource extraction); (3) manufacturing; and (4) tertiary (or services).

This methodology presents risks of mismeasurement, particularly of agricultural productivity. Agricultural employment may be overstated in census data, because individuals classified as agricultural laborers are likely to devote at least some time to non-agricultural activities. Agricultural value-added may also be understated if high-value urban or peri-urban agricultural production is undersampled. Together, these two sources of mismeasurement could lead to agricultural productivity being significantly underestimated. Gollin, Lagakos and Waugh (2014) attempt to account for potential sources of error for a group of African and other countries by recalculating agricultural value-added based on nationally representative household income surveys, and accounting for differences in hours worked and human capital when calculating employment. The authors find that alternate measures of agricultural value-added do not differ largely from the national accounts. Alternate measures of agricultural employment do reduce the productivity differential between agriculture and other sectors, but large differentials remain nonetheless. For the purposes of this study, we think that it is reasonable to conclude that the sector productivity

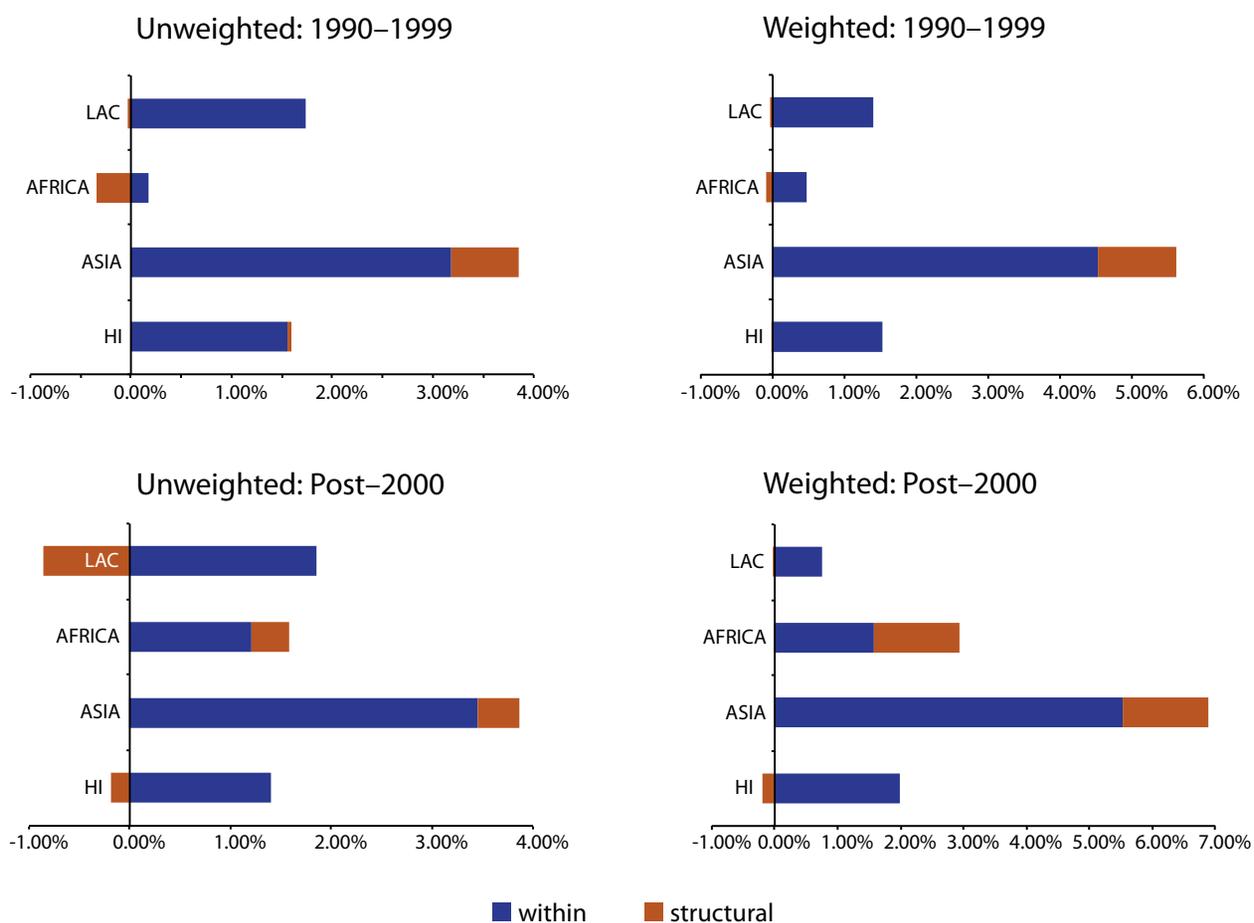
differences we detect are genuine, although magnitudes should be approached with caution.

Structural Change in Africa in Comparison with Change in Latin America and Asia

Figure 6.5 presents our central findings on patterns of structural change. Simple averages and employment weighted averages are presented for the periods 1990–1999 and 2000–2005 for four groups of countries: Latin America (LAC), Sub-Saharan Africa, Asia, and high-income (HI) countries. The most striking result in Figures 6.5 is Africa's turnaround. Between 1990 and 1999, structural change was a drag on economy-wide productivity in Africa: in the unweighted sample, overall growth in labor productivity was negative and largely a result of structural change. But from 2000 to 2005, structural change contributed around 1 percentage point to labor productivity growth in both the weighted and the unweighted samples. Moreover, overall labor productivity growth in Africa was second only to Asia, where structural change continued to play an important positive role.

Breaking the period into two also reveals something interesting about Latin America. It is only in the more recent period—2000 to 2005—that structural change has played a significant role in that region's overall productivity growth. In the unweighted sample, structural change reduces overall labor productivity growth by almost 1 percentage point. But when countries are weighted by employment, the contribution of structural change becomes minimal. Overall, Latin America's weak within-sector productivity growth seems to be a drag on the region's productivity in recent years.

FIGURE 6.5—DECOMPOSITION OF PRODUCTIVITY GROWTH BY COUNTRY GROUP*



Source: McMillan and Harttgen (2014). * Country employment shares are used as weights.

Patterns of Structural Transformation Among African Economies

Regarding the transformation process across African countries, for individual African countries, Table 6.1 and Table A1 in the annex show productivity growth decomposition results. For the 19 countries in the table, labor productivity grew by an (unweighted) average of 2.18 percent, and structural change contributed an (unweighted) average of 0.87 percentage points to overall labor productivity growth. Moreover, the results in Table 6.1 indicate that structural change contributed positively to growth in 17 of the 19 African countries in the sample. This positive contribution of structural change to economy-wide growth paints a somewhat more optimistic picture of growth in Africa before the onset of the current recovery (Badiane 2011; McMillan and Rodrik 2011).

TABLE 6.1—DECOMPOSITION OF PRODUCTIVITY GROWTH IN AFRICA (POST 2000)

Country	Labor Productivity Growth	Of which:	
		"Within"	"Structural"
Algeria	0.62%	0.43%	0.19%
Angola	5.68%	5.29%	0.39%
Cameroon	-2.61%	-3.08%	0.46%
Egypt	1.73%	3.20%	-1.47%
Ethiopia	2.09%	2.06%	0.03%
Ghana	3.63%	3.66%	-0.03%
Kenya	0.57%	0.29%	0.27%
Malawi	-1.73%	-1.80%	0.08%
Mali	2.81%	2.29%	0.52%
Mauritius	2.29%	1.82%	0.46%
Morocco	4.18%	3.16%	1.02%
Mozambique	4.91%	3.98%	0.94%
Nigeria	3.77%	0.96%	2.81%
Rwanda	3.96%	-0.16%	4.12%
Senegal	0.79%	-0.37%	1.16%
South Africa	2.47%	2.10%	0.38%
Tanzania	3.17%	0.76%	2.41%
Uganda	1.78%	-0.88%	2.65%
Zambia	1.30%	1.23%	0.57%
Africa Unweighted	2.18%	1.31%	0.87%
Africa Weighted	2.87%	2.07%	0.80%

Source: AfDB, OECD, UNDP, and UNECA (2013).

To get an idea of how structural transformation may have evolved in the larger group of African economies, the 54 countries were divided following McMillan and Harttgen (2014) into four distinct groups based on their level of development, structure of the economy, and growth trajectory. Broadly, (1) diversified established economies have relatively high levels of per capita income, and low exposure to extractive resources and agriculture as a share of GDP; (2) resource-driven economies are economies where extractive resources, such as oil and minerals, represent at least 30 percent of GDP; (3) emerging economies have relatively low levels of GDP per capita, rapid growth rates, and a high share of GDP coming from agriculture; and (4) pretransition countries have the lowest per capita incomes and rate of economic growth.

The analysis above was further expanded to examine the sectoral details of the transformation process for specific countries. Note that the contribution of structural change to growth depends on the extent to which the direction of labor flows is positively correlated with (end-of-period) labor productivity in individual sectors. So, for each of the above four groups of African countries, the relative (end-of-period) productivity of sectors ($y_{i,t} / Y_t$) was plotted against the change in their employment share ($\Delta \theta_{i,t}$) between 2000 and 2005, using the most recent survey data available from one representative country from each of these four categories. Mauritius, Nigeria, Uganda, and Malawi were chosen to, respectively, represent country categories (1) to (4).

Figure 6.6 shows the patterns of structural change for each of the country categories. The locus of the position of individual sectors in each

graph is determined by the rates of change in their relative productivity and employment shares. The size of each sector (measured by employment)

is indicated by the size of the circles around each sector's label in the scatterplots. Structural change in the group of diversified economies, illustrated by Mauritius, appears as enhancing growth and is driven by the relatively higher-productivity services sector. The size of the circles indicates that agriculture and mining are relatively unimportant compared with manufacturing and services. Similar to observed patterns in developed countries, the manufacturing sector has contracted in Mauritius. However, unlike some of the other more advanced economies in Africa and elsewhere, Mauritius has managed to grow its tertiary sector based on high-productivity activities that absorb significant amounts of labor. Thus, structural change in Mauritius has enhanced growth and has been based on services, but the story of Mauritius is atypical of Africa, south of the Sahara.

FIGURE 6.6—STRUCTURAL CHANGE AMONG AFRICAN COUNTRIES

Figure 6a. Mauritius

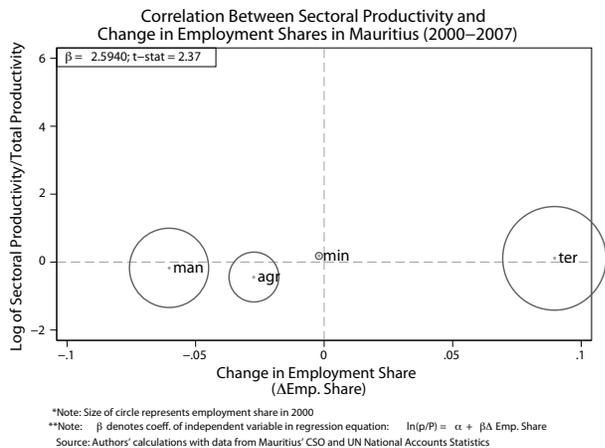


Figure 6b. Nigeria

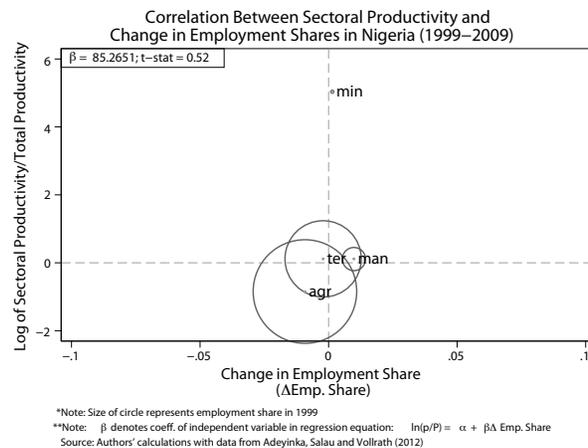


Figure 6c. Uganda

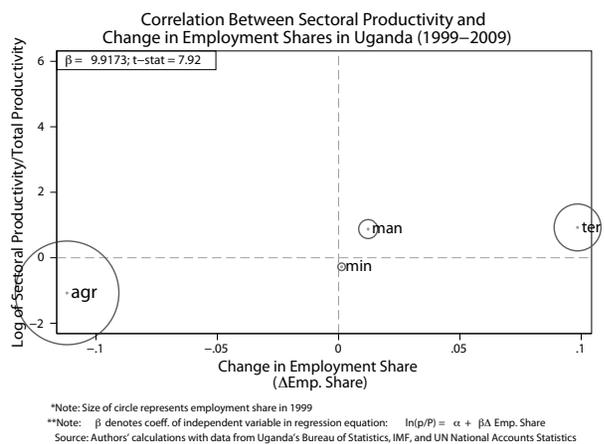
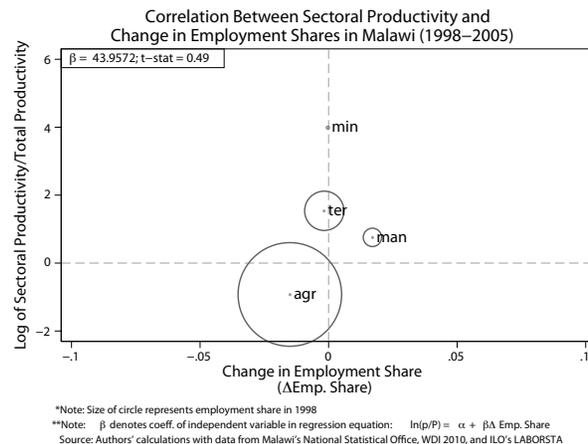


Figure 6d. Malawi



— Fitted values

For Nigeria, the representative of resource-driven economies, structural change has played a positive, but much less significant, role in increasing economy-wide productivity: the changes in employment shares in Nigeria are tiny compared with the changes in Mauritius. The main driver of this structural change has been a movement of labor out of agriculture and services into manufacturing. Notably though, the differences in productivity across these three sectors are not that large. This is probably due to the high degree of informality in all three sectors of the economy.

The case of Uganda illustrates remarkable changes for the group of emerging African economies. Between 1999 and 2009, the share of the labor force in agriculture fell by more than 10 percent, while the share of the labor force in manufacturing and services increased by around the same amount. Unlike Nigeria, productivity in manufacturing and services is significantly higher than productivity in agriculture. Thus, structural change in Uganda contributed significantly to overall growth in output per worker.

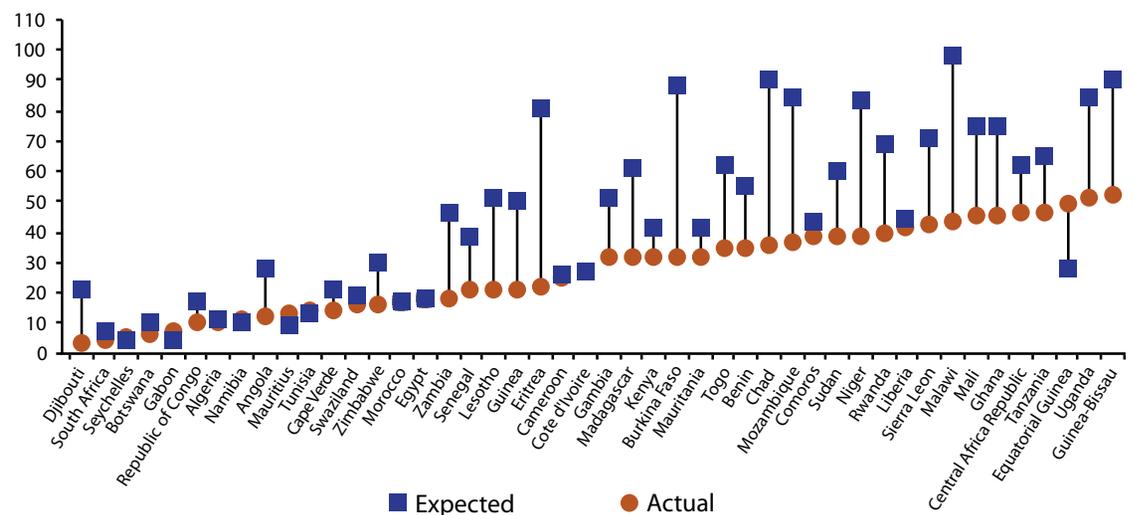
Finally, the group of pretransition economies, such as Malawi, shows limited but positive progress. In many ways, the structure of the economy is similar to that of Uganda, with the majority of workers in the following sectors in descending order: agriculture, services, manufacturing, and mining. The main difference is that structural change in Uganda's economy has been significant, while Malawi's economy has seen very little movement. The share of the labor force fell in agriculture as well as in the services sector by around 1.5 percent and 0.002 percent, respectively. These reductions in employment shares in agriculture and services were matched by a modest increase in the share of the labor force in manufacturing.

Structural Transformation, Sectoral Growth, and Poverty Reduction

As shown in Figure 6.5 (page 116), the positive transformation process shown is very recent and coincides with the strong economic recovery across the continent since the turn of the century. For the four preceding decades starting since independence, structural change among African countries has been a drag to growth among countries. As shown by Badiane (2014), the negative transformation performance during that period resulted from the outmigration of labor from a stagnating agriculture sector into a burgeoning services sector (defined here to include informal goods and services), with declining productivity levels. In other words, productivity-reducing structural change was the result of labor being forced out of a stunted agriculture sector into an oversized services sector. Notwithstanding the recent positive transformation performance, this outcome has significant implications for future growth prospects and trajectories among African economies.

To buttress that argument, the expected shares of the two sectors based on the level of development of African countries are compared with the actual shares. To identify expected shares for each sector, the relationship between per capita income and relative sector size was estimated for both agriculture and services using a sample including 210 countries over a period from 1960 to 2008 (Badiane, Ulimwengu, and Badibanga 2012). Figures 6.7a and 6.7b show, respectively, the discrepancies between actual and expected sizes of the agriculture and services sectors. The graphs rank countries in terms of actual size of the individual sectors. Invariably in all

FIGURE 6.7a—ACTUAL VERSUS EXPECTED AGRICULTURE SECTOR GDP SHARES



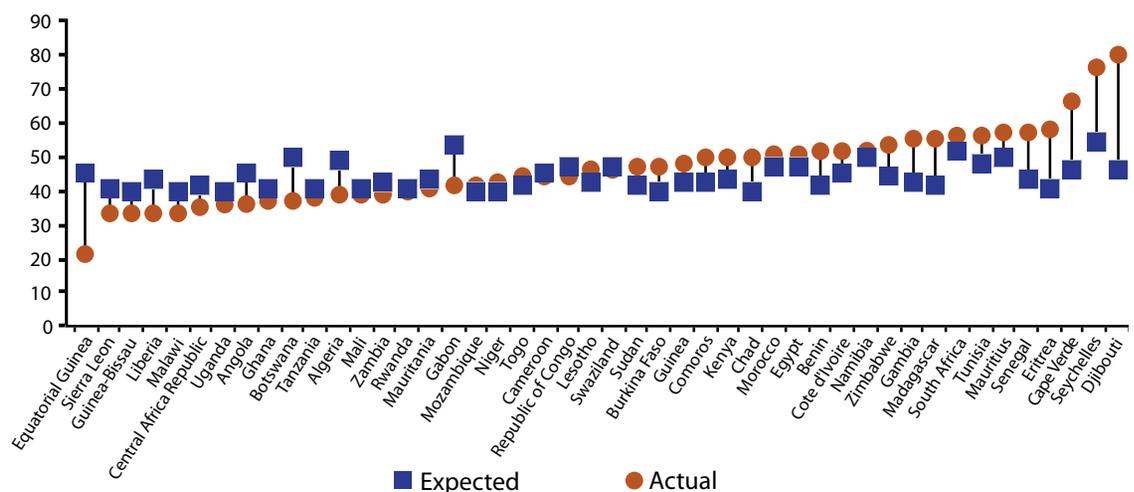
Source: Badiane, Ulimwengu, and Badibanga (2012).

countries, the actual share of the agriculture sector in GDP is distinctly lower than the size that should have been expected based on the level of per capita incomes. Observed average shares are around 30 percent, or nearly 20 percentage points below expected levels. The opposite is observed for the services sector in the majority of countries.

The extent of the sectoral imbalance can be seen by comparing sectoral shares among African countries with those of other developing regions. Indeed, as shown in Badiane (2014), the average share of agricultural GDP is significantly smaller among African countries compared with South Asian countries with similar levels of income. It is barely larger than the average share among countries in East Asia, the Middle East, and North Africa, which have per capita incomes that are three times higher than Africa. The comparison also reveals a relatively oversized services sector among African countries, which have the highest average GDP share for services, only slightly lower than Latin America. However, average per capita incomes among Latin American countries are nearly eight times higher than the African average.

Underperformance in the agriculture sector and the oversized services sector has not only delayed productivity-enhancing structural

FIGURE 6.7b—ACTUAL VERSUS EXPECTED SERVICES SECTOR GDP SHARES



Source: Badiane, Ulimwengu, and Badibanga (2012).

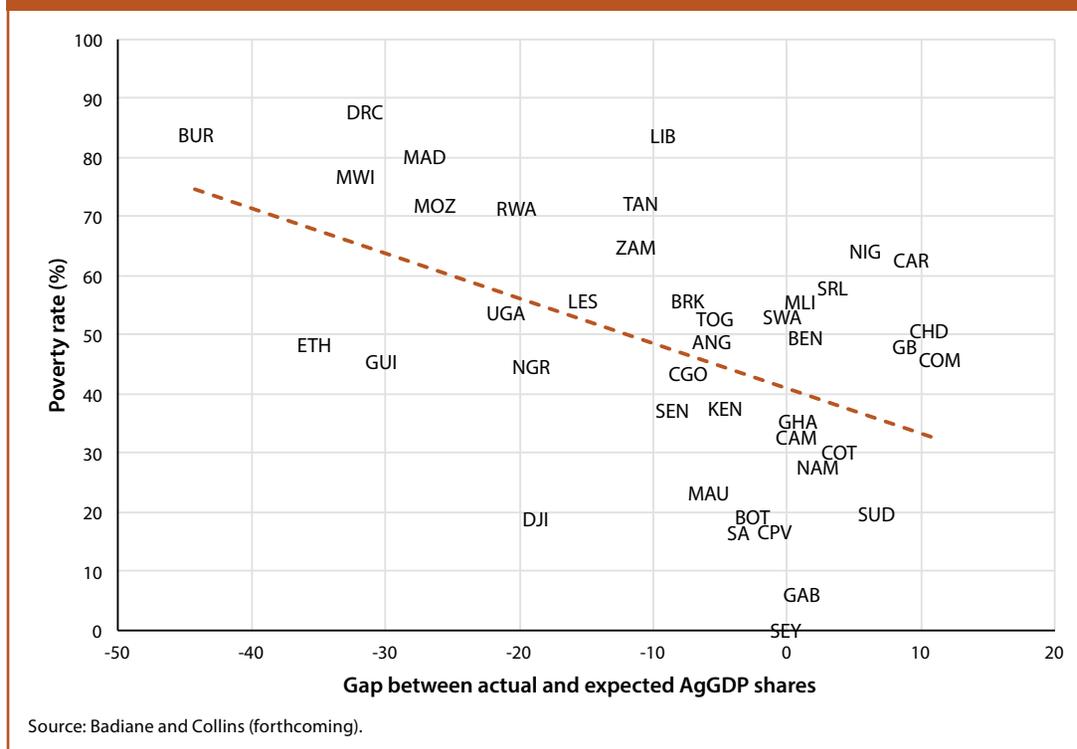
transformation in Africa; it has also resulted in higher poverty levels observed among Africa countries. Figure 6.8 shows the relationship between poverty levels and the observed performance gap or the deviation between observed and expected agricultural GDP shares. The size of the deviation decreases away from the origin and along the x-axis. In general, countries with higher performance gaps also have higher poverty levels.

*Beyond Agriculture versus Manufacturing: Rethinking Growth Strategies in Africa*⁴³

Until the early 2000s, agricultural labor productivity had stagnated (Figure 6.3b), despite a rapid decline in the sector’s employment and GDP shares in most African countries. Concurrently, productivity was falling in the non-agriculture sector, while employment rose rapidly in the sector. In that process, labor migration out of agriculture outpaced labor absorption growth in the non-agriculture sector, thus, further undermining productivity growth. As a consequence, the GDP share of the agriculture sector is now substantially smaller, while that of the services sector is significantly larger than observed historically in other countries at a similar level of development. More important than how we got here are the questions of where the growth transformation process of the last five to six decades leaves us and where we go from here.

⁴³ The analysis in this section and Section 2 is based on McMillan and Harttgen (2014).

FIGURE 6.8—AGRICULTURE SECTOR UNDERPERFORMANCE AND POVERTY LEVELS



As shown in preceding sections, the current structure of African economies is characterized by the dominance of the informal goods and services sector, which in most countries now constitutes the largest reservoir of low-productivity labor. Therefore, the theory based on the dual-economy—agriculture versus manufacturing—model may not work as expected in what has become a de facto three-dimensional economy—agriculture, industry, and informal goods and services. This is the same sector that is referred to by

Lewis (1979) as the “in-between sector.” Consequently, both terms are used interchangeably in the rest of this chapter.

In the current context of African economies, the strategic tension or trade-off is no longer just between industry-led and agriculture-led growth. Efforts to raise labor productivity within agriculture must remain a central component of strategies to further the process of economic transformation. However, the potential contribution of a “services-led” or an “in-between sector-led” strategy to the broader growth and development agenda in Africa opens up additional possibilities, not as a substitute for but as a complement and entry point to manufacture-based industrialization and continued focus on agricultural productivity. In other words, the informal or in-between sector must receive greater emphasis in future strategies not only to accelerate and sustain the recent growth process but also to maximize its impact in terms of employment creation and broad-based income growth.

Contribution of the Informal Goods and Services Sector to Employment and Growth

Because of the difficulty in obtaining data on employment in the informal goods and services sector, this section starts by looking at changes in the share of the population engaged in agriculture to provide an idea of the pace at which labor is moving into the in-between sector. Table A2 in the annex reports changes in the percentage of the population who report that their primary occupation is agriculture, by country, time period, and gender. The table is based on demographic and health survey (DHS) data. Average I at the bottom of the table is the average for all countries for which data are available for all three periods. For these countries, the share of the labor force in agriculture rises by a little under 1 percentage point between

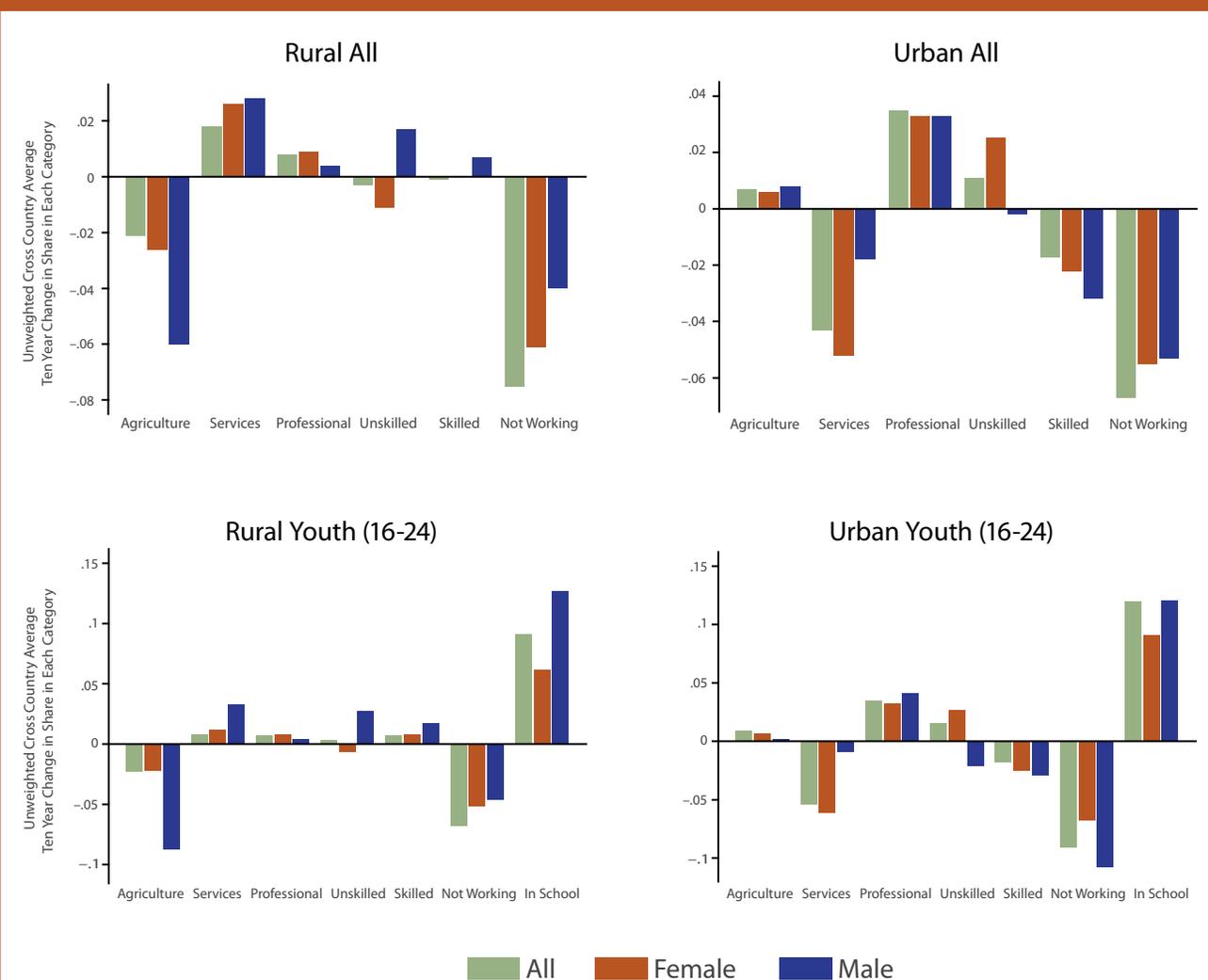
the 1990s and the early 2000s. This trend is driven by an increase in the share of the female labor force working in agriculture. In contrast, the share of the labor force working in agriculture fell by a little under 10 percentage points between 2000–2005 and 2006–2012. These changes are consistent in terms of magnitude with findings by other authors (McMillan and Rodrik 2011; Timmer et al. 2014). Although the figures show considerable cross-country heterogeneity, the pace of labor flow is much higher between the second and third periods than between the first and second periods. Given the limited growth in the manufacturing sector, it can be concluded with some degree of confidence, that there has been a sizable migration of labor from agriculture into the in-between sector over the past decade, and the pace of migration is accelerating with faster economic growth.

Regarding employment changes by category of occupations, age, and gender, the occupations considered are (1) agriculture, (2) professional services, (3) other services, (4) unskilled manual labor, (5) skilled manual labor, (6) not working, and (for the young) (7) in school. The shares are reported for each country for the year in which the initial survey was conducted. Agriculture includes both subsistence and commercial farmers. Ideally these categories would be separate, but the data do not permit such a disaggregation. Like agriculture, all other occupations include both formal and informal sector workers. The clerical and sales grouping includes secretaries and typists, sales clerks, street vendors, drivers, and traditional healers. Unskilled manual labor includes garbage collectors, construction workers, and factory workers. Skilled manual labor includes masons, mechanics, blacksmiths, telephone installers, and tailors. Finally, professional occupations include business owners, engineers, financiers, teachers, doctors, health professionals, lawyers, and civil servants.

Figure 6.9 shows decadal changes in the share of population working in each occupation by age, gender, and geographic location. The blue bars represent males, the orange bars represent females, and the light green bars are for the total population or weighted average of the results for males and females. The patterns that emerge are generally consistent with the patterns described above and in Table A3, but with some additional nuances for population subgroups. For example, the share of population engaged in agriculture declined sharply in rural areas while rising slightly in urban areas; this was equally true for men and women. The rise in agriculture-based employment in urban areas reflects the growth in peri-urban and nontraditional segments of the sector.

Figure 6.9 also shows that employment in clerical and sales services has risen in rural areas but has declined in urban areas. While the share of the population engaged in professional services has risen across the board, the trends in occupational shares for skilled and unskilled manual labor cannot be

FIGURE 6.9—AVERAGE CHANGE IN WORKING POPULATION IN A GIVEN OCCUPATION, 2000–2012



Source: McMillan and Harttgen (2014).

Note: Average predicted 10-year changes are computed as a simple unweighted mean of country-specific 10-year changes. These changes correspond to the coefficient on the final-year dummy of a country-specific regression of occupation on time dummies with the first year excluded; these changes were then annualized and multiplied times ten to get the predicted 10-year change. Countries in the sample include Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Tanzania, Uganda, Zambia, and Zimbabwe.

neatly classified. In urban areas, the share of the population engaged in skilled manual labor has declined across all groups, in contrast to a slight increase in the share of rural men—young and old—engaged in skilled manual labor. Unskilled manual labor rises for women only in urban areas, whereas in rural areas the share of the population working in unskilled manual labor increases only for men.

Across all subgroups, the largest change that took place is the decline in the share of the population who report that they are not working. In other words, labor force participation by men and women, young and old alike, appears to have risen over the past decade. Finally, the figures show an increase in the share of the young (age 15–24) in school, in both urban and rural areas, for boys and girls alike. However, the increase is, higher for young men than young women, and the gap between the two is larger in rural areas than in urban areas.

In sum, the changes described above provide a more refined view of recent trends in employment dynamics, and in particular the transfer of labor from the rural and agriculture sectors into urban-based activities, including agriculture-related activities. This lends further support to the call for greater emphasis in future growth and industrialization strategies on the growing informal goods and services sector.

Rise of the In-between Sector and Role of Domestic Demand

In the large majority of African countries, the informal goods and services or in-between sector accounts for the bulk of activities outside of agriculture and manufacturing, which in Table 6.2 is labeled “services.” As shown by the figures reported in the table, the manufacturing sector has been a major driver of the recent recovery. The table presents simple average annual growth rates in overall GDP and sectoral per capita growth rates for 38 African

countries. The countries are divided into four groups according to whether GDP and agricultural GDP per capita growth rates are above or below the continental average. High-High indicates rapid growth in both GDP and agricultural GDP per capita. High-Low indicates rapid growth in GDP per capita with below-average growth in agricultural GDP per capita and vice versa. Finally, Low-Low indicates lower-than-average growth in both GDP and agricultural GDP per capita.

TABLE 6.2—AFRICAN COUNTRIES’ ECONOMIC GROWTH IN THE 21ST CENTURY

Growth category	Per capita annual growth rate 2000–2012				Number of countries	Number of countries with SerGDP gr > GDP gr	Number of countries with MfgGDP gr > GDP gr
	GDP	AgrGDP	MfgGDP	SerGDP			
Africa average	2.6	1.0	2.2	3.5	39	28	11
High-High	4.8	3.9	4.0	6.1	11	10	3
High-Low	3.5	-0.6	2.4	3.8	6	3	2
Low-High	1.3	1.8	1.1	2.0	5	4	2
Low-Low	0.3	-0.9	0.4	1.0	17	11	4

Source: Diao and McMillan (2014).

Notes: Agr = agriculture; GDP = gross domestic product; Mfg = manufacturing; Ser = services; gr = growth. The calculation considers developing countries in Africa south of the Sahara only (excluding South Africa and Mauritius). Five African countries with a population of less than one million, and Somali and South Sudan (lacking data), are excluded. The Africa average excludes countries with overall GDP per capita growth rates.

The analysis here focuses only on countries with positive GDP per capita growth in the post-recovery period, given the interest in finding out the contribution of the in-between sector in that growth, although such countries can still have negative growth in specific sectors. Based on this principle, the average annual growth rate for the continent as a whole is estimated at 2.6 percent for GDP per capita, 1.0 percent for agricultural GDP per capita, 2.2 percent for manufacturing, and 3.5 percent for services, both in per capita measures. A total of 11 out of 39 countries that make up the High-High group show a GDP per capita growth rate that is about double the African average. Countries in that group also have agricultural GDP per capita annual growth rates that are nearly four times the continental average, and manufacturing as well as services sector per capita growth rates that are two times the African average. For the entire group of African countries in the sample, nearly three-quarters—28 out of 39—of the countries have a services GDP growth rate that is higher than the rate of overall GDP growth, compared with about one-fourth of the countries with the manufacturing sector growing faster than GDP.

Detailed results for individual countries are presented in Table A3 in the annex. The top of the table lists 17 African countries with per capita GDP growth rates higher than the Africa average shown in Table 6.2. For 13 of these countries, growth in the services sector has been faster than the overall GDP during the post-2000 period. In contrast, 5 of the 17 fast-growth countries have manufacturing GDP growth rates higher than their average GDP growth rate, and another 4 have manufacturing growth rates close to the rate of GDP growth (Table A3, Column 3). The above figures bolster the argument that is made in terms of the increasingly dominant

role of the informal goods and services or in-between sector in the growth of African economies.

Table A3 also shows that growth in GDP per capita has not been led by natural resources, as frequently argued. For example, among the best performers, Nigeria is known as the largest oil exporter in Africa, but its growth in agriculture, manufacturing, and services is either close to or higher than overall growth in GDP per capita. In fact, at current prices, the share of mining in GDP in the Nigerian economy fell by more than 20 percent between 2000 and 2012. Also, Ghana found oil in 2007 and started to export oil only in 2010, but its persistently stable economic growth started long before the oil discovery. Similarly, Botswana's recent growth does not seem to be led by diamond exports, judging from the negative growth rate in the mining sector. Moreover, there are a number of resource-rich countries with poor growth performance, such as Gabon, Guinea, and Sudan. Another major mineral-rich country, the Democratic Republic of the Congo, is growing at the continental average. Finally, several countries less dependent on natural resources have done very well. For example, Ethiopia is one of the three best-growth performers; Rwanda, Tanzania, and Uganda are among the seven good-growth performers; and Burundi, Burkina Faso, and Lesotho are among the other fast-growth performers.

The role of export markets can be gleaned for the figures in Table A4 in the annex. In 13 of the 17 fast-growing economies, growth in total goods and services exports is higher than the growth of GDP. However, this export growth cannot be explained by natural resources or the commodity price boom alone. Only five of these countries depend heavily on natural resource exports, and for many, such as Ethiopia, Ghana, Rwanda, Mozambique, Tanzania, and Uganda, natural resources and other primary commodity exports are a smaller

share of GDP. In fact, for some natural resource-rich countries, such as Botswana and Nigeria, the share of natural resource exports in total exports has fallen in recent years.

So what are these countries exporting? As shown by Diao and McMillan (2014), the manufacturing sector in Africa is starting to grow. Between 2000 and 2010, the share of manufacturing exports in goods and services more than doubled from 10 percent to 23 percent; and if a handful of oil exporters are excluded, the share rises to 32 percent. These numbers are not driven by just a few countries; quite the opposite, they are based on a group of 34 countries. They are also not driven by one or two products; the range of manufactured exports varies from labor-intensive activities, such as textile and shoe manufacturing, to capital-intensive activities, such as petroleum refining.

In sum, however, the overall contribution of trade to growth remains relatively small. For most countries with exports growing faster than GDP, imports also grow more rapidly than GDP, indicating that the net contribution of trade to GDP growth is much smaller. Indeed, Table 6.3 shows that the net contribution of trade to growth, measured by an increasing (declining) share of net exports (imports) in GDP between 2000 and 2012, is negative for 13 of the 17 fast-growing countries. It is positive in only five countries: Burkina Faso, Chad, Ghana, Lesotho, and Zambia. Thus, the role of exports in Africa's recent growth should not be overstated.

Looking at the expenditure side reveals that domestic demand—that is, final consumption plus gross capital investment—rather than net exports, accounts for the bulk of GDP growth. In addition,

investment demand or gross capital formation seems to be even more important than final consumption in growth: the share of capital investment

TABLE 6.3—SHARE OF FINAL CONSUMPTION, INVESTMENT, AND NET EXPORTS IN GDP AT CURRENT PRICES FOR THE 17 FAST-GROWTH AFRICAN COUNTRIES (2000 AND 2012)

Fast-growth countries	Growth rate GDP pc	Share in GDP: Final consumption		Gross capital formation		Net exports	
		2000	2012	2000	2012	2000	2012
<i>Best-growth performers</i>							
Angola	8.0	60.4	70.4	12.8	11.7	26.8	17.9
Ethiopia	6.4	89.0	85.0	23.1	33.1	-12.1	-18.1
Nigeria	6.2	60.9	68.5	7.0	12.9	32.1	18.6
<i>Good-growth performers</i>							
Rwanda	5.4	105.2	97.6	13.4	22.8	-18.6	-20.4
Mozambique	4.8	89.5	93.2	31.0	48.3	-20.5	-41.5
Sierra Leone	4.8	110.3	113.3	11.0	24.1	-21.3	-37.3
Chad	4.4	94.5	85.6	23.3	26.5	-17.8	-12.1
Tanzania	4.0	89.9	78.4	16.8	39.4	-6.8	-17.8
Ghana	3.8	94.4	79.5	24.0	30.9	-18.4	-10.4
Uganda	3.6	92.0	91.1	19.5	24.6	-11.4	-15.6
<i>Other fast-growth countries</i>							
Namibia	3.3	86.6	86.5	17.1	23.4	-3.7	-9.9
Lesotho	3.3	158.5	129.7	41.3	31.8	-99.9	-61.5
Burundi	3.2	107.1	100.1	2.8	28.4	-9.9	-28.5
Botswana	3.1	58.7	71.1	29.6	34.4	11.7	-5.5
Zambia	3.0	96.5	72.1	17.4	24.7	-13.9	3.2
Burkina Faso	2.8	99.4	79.0	16.8	27.8	-16.1	-6.8
Congo, Dem. Rep.	2.7	96.8	85.3	1.4	26.5	1.7	-11.8

Source: Diao and McMillan (2014).

Notes: Final consumption expenditure + gross capital formation + net exports = gross domestic product (GDP) in current price. pc = per capita.

in GDP rises in 15 of the 17 fast-growing countries during the period under consideration. Among these, in 11 countries the share of final consumption in GDP falls during the same period.

Promoting Innovation, Growth, and Employment in the Informal Goods and Services Sector

In general, the content of Table 6.3 confirms the fact that domestic markets are still by far the dominant destination for agricultural and manufactured goods and services produced by African countries. The informal services or in-between sector, which has been shown to have contributed significantly to the economic turnaround in the last decade and a half, produces exclusively for the domestic market. The same sector has also emerged as a growing pool of low-productivity labor. This makes efforts to modernize and raise productivity in the sector a critical component of future growth strategies to accelerate and broaden the ongoing growth recovery, alongside investments in increasing agricultural productivity. Indeed, the heavy concentration of proto-industrial activities (e.g., handicrafts, processing of local staples) and low-productivity labor in the sector offers additional options to the traditional model of industrialization based on manufacturing. Future strategies of industrial growth that also emphasize enterprise creation and growth in order to modernize the in-between sector may do more, in the short to medium run, to raise labor productivity and reduce poverty than strategies that only target traditional manufacturing (Badiane and Makombe 2015).

The analyses by Sonobe and Otsuka (2006, 2011) of the industrial development process and drivers in Asia and Africa provide useful

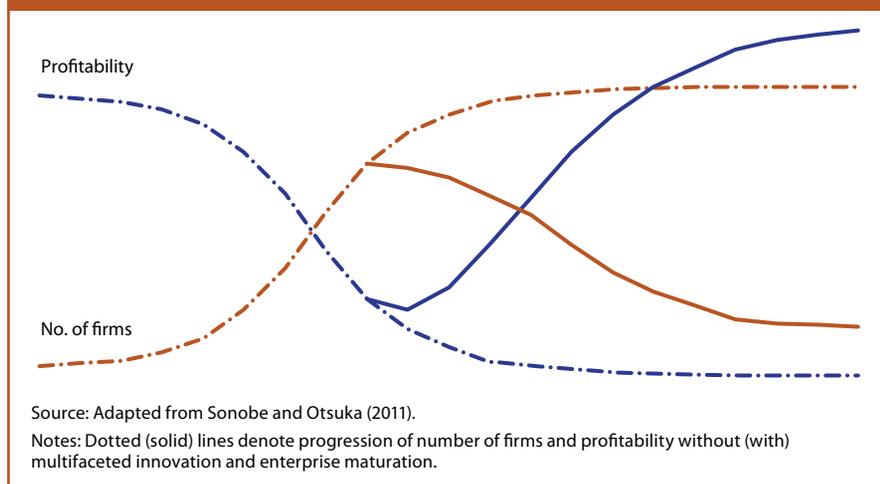
insights and guidance regarding strategies and policies to transform and modernize the informal goods and services sector across the continent. Their model of endogenous industrial development in low-income countries is summarized in Table 6.4 and illustrated in Figure 6.10. According to the model, indigenously developed industries start with a number of small and medium-sized enterprises, often clustered around the same geographic area, imitating foreign technology to produce similar and related low-quality products. In the case of the informal goods and services sector in Africa, enterprises also reproduce traditional home goods and handicrafts. Moreover, a growing number of these enterprises now are engaged in the processing, packaging, and distribution of traditional food staples. Examples include the

TABLE 6.4—PHASES OF CLUSTER-BASED INDUSTRIAL DEVELOPMENT AND POLICY PRIORITIES

Phase	Innovation, imitation, and productivity growth	Institutions	Policy priorities and actions
Initiation	Imitation of foreign technology, production of low-quality products	Internal production of parts, components, and final products	1. Markets to lower transactions costs
Quantity expansion	Entry of a number of followers, imitation of imitated technologies, and stagnant productivity	Gradual development of market transactions, and formation of industrial cluster	2. Vocational training to improve management practices 3. Infrastructure: roads, communication, electricity to lower operating costs
Quality improvement	Multifaceted innovations, exit of noninnovative enterprises, and increasing productivity and export	Reputation and brand names, direct sales, subcontracts, or vertical integration, and emergence of large enterprises	4. Knowledge transfer from abroad, industrial zones, access to credit, intellectual property

Source: Based on Sonobe and Otsuka (2011).

FIGURE 6.10—DEVELOPMENT PATTERNS OF INDIGENOUS INDUSTRIAL CLUSTERS



processing of ready-to-eat maize-, cassava-, or millet-based foods. Hence, the modernization of the informal goods and services sector involves not just metal, leather, wood, garment, small-scale electrical, and machinist workshops, but also the emerging agribusiness enterprise sector. In all these cases, the concept developed by Sonobe and Otsuka is applicable.

The initiation phase, as described in Table 6.4, is driven by the imitation of foreign products for the domestic markets. In the case of the emerging agribusiness enterprise sector, it is more often the introduction of new processes, sometimes mechanized, of producing and distributing traditional foods outside of the household setting through specialized enterprises. In both cases, once a new product or business makes a successful appearance in local markets, it is copied by a large number of imitators and new entrants who apply the same technology and produce the same low-quality goods for the same local markets.

During this quantity expansion phase, a rapid increase in the number of firms and supply of products takes place, leading to a progressive decline in profitability. In the absence of innovation in production technology and business practices, the number of enterprises continues to rise and profit continues to decline (dotted line in Figure 6.10). The result is a situation characterized by a large concentration of low-productivity, persistently small enterprises, with no capacity to grow or create well-paying jobs, as is the case in a large segment of the informal goods and services sector.

In a process of successful industrialization, some enterprises will eventually succeed in improving product quality, raising profitability, and growing in size through innovation in production technology and management practices, facilitated by investment in physical and human resources. Many of the enterprises that are not capable of innovating will be forced to exit. The result is a decrease in the number of firms, an increase in average firm size, and a rise in profitability (second half of the solid lines), as observed in Asian countries. The experience in Africa has been different, with very few exceptions.

In addition to their own case studies, evidence by other researchers cited by Otsuka and Sonobe (2011) suggests that industrial clusters in Africa seldom manage to emerge from the quantity expansion phase. They tend to invest less in both physical and human resources than their counterparts in other regions. Consequently, they persist in producing lower-quality goods less efficiently, leading to slower growth in the industrial sector and delayed transformation of national economies. Indeed, compared with their counterparts in other developing regions, enterprises in African industrial clusters generate lower added value and employ fewer workers on average.

Modernizing the Informal Service Sector and Developing Agribusiness

The transformation of African economies for employment creation and income growth requires industrial development strategies and policies to produce the types of innovations that are needed to facilitate quality improvement and enterprise growth in the informal goods and services sector. Key sectors to be targeted include the proto-industrial handicraft and home goods production sectors, as well as the food staples processing sectors. These sectors tend to be labor intensive, and their successful transformation would lead to rapid job creation. Because businesses in the same sectors tend to be based in urban and peri-urban areas, including small towns, faster enterprise growth would raise the capacity to absorb the surplus labor from the rural and agriculture sectors and enhance the quality of structural change in African economies.

The strategic challenge of modernizing the informal goods and services or in-between sector is how to transition from a situation with a large and increasing number of small enterprises producing low-quality goods with low and declining profits to a situation where enterprises can expand operations, improve product quality, raise profitability, and thereby create employment and wealth for themselves and society. Rapid urbanization, the rise of a middle class, a booming construction sector, and changing eating habits and food demand patterns all create a new environment that is favorable to accelerating both quantity expansion and the transition to quality improvement/upgrading in the household goods and agribusiness industries. Successful industrial development policy targeted at these sectors should allow African countries not only to sustain and even accelerate the recent pace of economic growth,

but to also broaden the impact of future growth in terms of employment and wealth creation.

In terms of Figure 6.10, the strategic question is how to get enterprises in the informal goods and services sector off the trajectory depicted by the dotted lines to one denoted by the solid lines. The latter trajectory is characterized by (1) a gradual decline in the overall number of enterprises, (2) a growing share of larger enterprises in terms of employment and sales revenues, (3) higher average productivity, and (4) improved product quality. For this to happen, enterprises need to acquire capacities to undertake innovations in critical areas, such as labor management, product quality, marketing and sales, and procurement of material inputs.

The last column of Table 6.4 lists a series of indicative actions and interventions available to governments and professional organizations to promote growth in the informal goods and services sector. At the quantity expansion phase, which is characteristic of the current status of the in-between sector in a typical African country, enterprise growth is constrained by poor management practices. At this stage, the vast majority of entrepreneurs are trained under a system of informal apprenticeship. Under such a system, when apprentices leave to create their own businesses, they imitate the same products as their masters. They are not prepared to innovate for growth. While this may be adequate as the starting point, what becomes a developmental problem is when older as well as well newly established businesses find themselves in a trap in which they apply the same practices, produce the same low-quality products, sell to the same local markets, suffer declining prices and profitability, and continue to operate at very small scales. Enterprise growth, wealth creation, and poverty reduction become impossible in such an environment.

Key interventions to promote enterprise growth in the above environment include investments in effective mechanisms to (1) help entrepreneurs acquire the required skills and tools to improve product marketing, and (2) create learning opportunities to improve technical and management practices, particularly through ready access to vocational training. Despite their limitation in scope and approach, case studies by Sonobe et al. (2010) in Ghana and Kenya, among the very few that exist in Africa, have demonstrated the positive impact of short-term management training dealing with business planning, marketing, production management, quality control, and financial management. In particular, the Ghana case study, based on a three-week training program, resulted in significant improvement in several areas within a few months after the training. These include improved record keeping, including book keeping; increased marketing and customer relations activities; and increased sales revenues and profit compared with the same period during the prior year. More important, participants in the training program succeeded in reversing declining trends in sales, value-added, and gross profit, in contrast to the control group, which continued to battle declining trends. The authors compared the impact of the short-term training program with that of formal education on sales revenue, value-added, and gross profit. They found the impact of the three-week training to be similar to that of 10 years of formal schooling. The Kenya case study found a similar strong impact.

In both Ghana and Kenya, the analysis documented declining sales revenues, value-added, and gross profit over time, confirming the typical trends in decreasing enterprise size and profitability as the number of new firms increases and competition rises without accompanying product sophistication and marketing innovation. In both cases, learning to improve

production and management skills through short-term training has been shown to be an effective strategy to change the above trajectory.

These findings call for greater investment by African countries in vocational and professional training, targeting in particular the informal goods and services sector, to accelerate structural transformation to promote employment growth and raise incomes. Business training programs have not shown uniformly positive results, and more research is needed to identify the most effective curricula and design elements for such programs (McKenzie and Woodruff, 2012). However, given the generally low levels of formal education among enterprises in the sectors and in countries in general, mainstreaming vocational and professional training seems like a justifiable priority for long-term industrial development policies. As suggested in Table 6.4 (page 127), vocational training is an intervention that may be most appropriate for enterprises in the initiation and quantity expansion stages of industrial development. Indeed, the enterprises examined in Sonobe et al. (2011) seem to have been in the quantity expansion stage, when the lack of knowledge and skills necessary for product differentiation and increasing profitability were among the binding constraints. During these stages, additional investments in supporting infrastructure, such as markets, roads, communications, and electricity, are critical complements to training and learning programs. Such investments can be targeted to the location of clusters to reduce their costs and raise their effectiveness.

The interventions described above can help soften the downward pressures on sales, prices, and profits during the quantity expansion phase. However, transition to the quality improvement phase will require enterprises with strong capacities for multifaceted innovations—that is,

innovations in product quality, production methods, internal management, sales, and marketing. In addition to mainstreaming vocational training, this will require more advanced training in product quality control, marketing, accounting, labor management, basic engineering theory, and practice. This includes creation of adequate institutional infrastructure to promote learning from abroad, including the importation and adaptation of foreign technologies from more advanced—in particular, recently industrialized—economies, through adaptive research and training. At this stage of the enterprise development process, access to credit to finance growth and property rights to stimulate innovation will emerge as constraints that need to be addressed by policies. Infrastructure-related constraints, such as suitable production sites, adequate transport, and reliable power supply, rise in importance and need to be tackled.

To deal with the above constraints, Asian countries, for instance, have in part created industrial zones that make it possible to target the use of limited resources more effectively. The experience of Asian countries also shows that the actions and interventions listed in the last column of Table 6.4 are more likely to succeed when they are carried out in the context of an entrepreneur-led and government-assisted strategy (Sonobe and Otsuka 2006, 2011).

In sum, the large and rapidly growing informal goods and services or in-between sector should be a major focus for labor-intensive industrial development. The sector is on its way to becoming the largest pool of low-productivity labor, including youth and women. The rapidly growing middle class, which is demanding more sophisticated household goods and food, as well as the fast-growing construction sector both create a favorable environment for product innovation and upgrading across major segments

of the sector. Promising sectors include metal, leather, and wood-based handicrafts; furniture; electrical fittings; and processing, packaging, and distribution of traditional staples and other agricultural commodities.

Strategic priorities need to focus on raising the stock of technology capabilities and managerial skills and promoting their applications to produce better-quality, higher-value goods. The goal, in the short to medium term, is to increase the number of successful entrepreneurs by effectively improving production methods, as well as marketing and management skills. In the medium to long term, attention needs to turn to infrastructure, as well as regulatory and macroeconomic policies.

Mitigating the barriers to regional trade that limit the size of markets presents a further option for promoting the growth of informal firms. In some cases, low demand presents a constraint on informal firm growth (Benjamin and Mbaye, 2012). Removing barriers to regional trade would permit smaller and poorer countries to benefit from larger middle class consumer bases in neighboring countries. Actions to promote regional trade will complement efforts to achieve the Malabo Declaration commitment to tripling intra-African trade in agricultural commodities and services by 2025. These should include the simplification of border procedures, investment in transport and trade infrastructure, and actions to reduce corruption and road harassment.

Conclusions

Since the turn of the century, African countries have been undergoing an unprecedented agricultural and economic recovery process, which comes in the aftermath of decades-long stagnation and decline. How to sustain and accelerate the current growth recovery is the most important strategic

development question currently facing African countries. To draw lessons for future policies and strategies, this chapter has sought to shed more light on the nature of the recovery process. Toward that end, it examined the patterns and quality of the structural transformation process, analyzed sectoral dynamics in terms of changes in productivity and employment, and derived implications for future strategies to boost growth, create employment, and generate wealth as broadly as possible.

Key findings show that the patterns of structural transformation among African economies during the recovery period since the turn of the century are similar to patterns observed historically in other developing regions. This is in strong contrast to observed patterns since independence, which were more disruptive than supportive to the growth of African economies. The findings also point to the dominant roles of the informal goods and services sector and of local demand in the renewed growth performance.

The consequences of poor economic performance during the first four decades following independence have led to a structure of most African economies in which the informal goods and services or in-between sector

(besides agriculture and manufacturing) has emerged as an important and growing pool of low-productivity labor. That sector is dominated by small and medium-sized enterprises producing metal-, leather-, wood-, and textile-based products, as well as simple electrical products and machines for the domestic market. The sector also includes the rising, urban-based agribusiness enterprises processing and distributing traditional food staples for the rapidly growing middle class.

The rise of the in-between sector and growing role of domestic demand call for growth and industrial development policies that go beyond the dualistic, agriculture versus manufacturing model. Strategies to further deepen the positive transformation process that took place over the last decade must maintain focus on the need to raise agricultural productivity, while also placing more emphasis on enterprise creation and growth in the labor-intensive informal goods and services sector. Therefore, this chapter has reviewed the model of endogenous industrialization followed by many Asian countries, and has identified important lessons for consideration by African countries.

CHAPTER 7

Renewing Industrialization Strategies in Africa

Patrick Kormawa and Afeikhena Jerome



Introduction

Growth in real gross domestic product (GDP) in Africa has averaged 5.4 percent a year during 1995–2013, with nearly one-quarter of countries in the region growing at an average rate of 6 percent or higher (OECD/AfDB/UNDP 2014). The region is now the second highest growing in the world, outperformed only by East Asia and the Pacific region. Overall, the size of the regional economy has more than doubled (in real terms) during this period (Diop 2015). The increase in Africa's economic size during this period is likely to be even larger than previously thought, as shown by the results of recent rebasing of nominal GDP in several countries. (Ghana commenced the current round of rebasing in 2010, which saw its economy surge by 62 percent; Nigeria rebased in 2014 and the size of its economy increased by 89 percent, thus surpassing South Africa to become Africa's largest economy, at US\$510 billion; Kenya experienced a 25.3 percent increase and Uganda 13 percent after both countries rebased in 2015.)⁴⁴

Yet, important risks remain. Economic growth is still largely driven by commodity exports, especially oil and metals. The economic structures of several African countries, especially the resource-rich countries, have become more concentrated, making them more vulnerable to external shocks. This is in sharp contrast to the growth pattern of other developing regions, especially Asia, where growth has been driven by a solid industrialization agenda underpinned by manufacturing. Slumping oil and commodity prices, a slowdown in China's pace of industrialization, and the Ebola outbreak that severely disrupted economic activity in Guinea, Liberia,

and Sierra Leone are already conspiring to bring down Africa's growth rate this year to its lowest in two decades.

Recent growth in Africa has also not been accompanied by significant structural transformation characterized by a reallocation of resources from low-productivity activities into modern, high-productivity sectors such as manufacturing (UNECA 2014; ACET 2014). Available evidence suggests that structural transformation in Africa is either growth retarding (McMillan and Rodrik 2011) or at its formative stage and marked by atypical transition from agriculture to service, bypassing manufacturing (McMillan and Harttgen 2014).

As a result of very low poverty to growth elasticity, Africa is the only region in the world that has experienced an upsurge in poverty over the last three decades, in stark contrast to the dramatic gains in the fight against poverty that were achieved particularly in Asia. Thus, Africa is still home to a disproportionate 30 percent of the world's poor despite comprising merely 12 percent of the world population. Worse still, the number of people in extreme poverty has doubled to some 300 million people since the mid-1980s and is expected to reach as high as 400 million by 2015 (Ajakaiye and Jerome 2014). Moreover, Africa's recent growth has not been inclusive because it fails to provide remunerative employment opportunities for its rapidly growing youthful population. Only one in two young Africans participates in wage-earning jobs because most economic activities take place mainly in the informal sector, accounting for more than half of GDP and employing more than 80 percent of the population (World Economic Forum 2015). Deprived of gainful means of livelihood, many fleeing African

⁴⁴ All dollar figures are in United States Dollars.

youths are embarking on the deadly boat rides through the Mediterranean in the quest to migrate illegally to Europe. In February 2014 alone, as many as 1,100 migrants, mainly from Africa south of the Sahara (SSA), were rescued from inflatable boats 220 kilometers off the coast of Italy (Global Initiative Against Transnational Organized Crime 2014).

Indeed, more than half of the 20 lowest ranked countries in the Global Competitive Index ranking of 2014/2015 were African countries, and overall the region continues to underperform in many areas of the basic requirements of competitiveness: the infrastructure deficit remains profound, and despite gradual improvements in recent years, health and basic education remain low and institutions are inchoate. The highest ranked country was Mauritius at 39 out of 144 countries, 17 places ahead of the second-ranked country, South Africa, at 59. No African country featured in the 37 countries tagged as innovation-driven economies.

In sum, Africa's recent economic growth is no doubt masking serious future growth challenges that will need to be addressed if African economies are to join the rank of middle-income economies. In spite of the positive growth performance of African economies since 1995, lack of structural change—the shift of resources from low-productivity to more dynamic higher-productivity sectors—continue to elude Africa and limit its long-term growth prospects and opportunities for productive employment. Africa's relevance in the global economy today seems to be relegated to that

of a source of raw materials, and this has to change. Going forward, the main challenge will therefore be to turn high growth into inclusive growth. This will require focusing on efforts to transition from still largely agriculture-based economies to higher value-added activities through industrialization to address these challenges.

Nonetheless, there is a renewed push for industrialization in Africa in recent years and a groundswell of activities around industry. At the request of the African Union, the United Nations Industrial Development Organization (UNIDO) has formulated, together with African governments and the private sector, the “Action Plan for the Accelerated Industrial Development of Africa (AIDA),” a strategy that aims to mobilize both financial and nonfinancial resources and enhance Africa's industrial performance. AIDA was adopted by African heads of state at its summit in 2008, which was devoted to industrialization.⁴⁵ AIDA is a central pillar of the new Africa's strategy for 2063 and of the Africa-EU roadmap for 2014–2017.

Africa Industrialization Day is now celebrated with fanfare on November 20 each year.⁴⁶ The Sixth Joint United Nations Economic Commission for Africa and the African Union Conference of Ministers of Economy and Finance met in Abidjan on March 25–26, 2013, and deliberated on the theme “Industrialization for an Emerging Africa” (African Union 2013a). Since 2013, the Economic Report on Africa, jointly produced by the Economic Commission for Africa and the African Union, has focused

⁴⁵ AIDA provides practical options and an integrated framework for accelerating industrial development at regional and continental levels. It comprises 16 programs and 49 projects to be undertaken within seven clusters and its accompanying implementation strategy.

⁴⁶ The 25th Ordinary Session of the Assembly of Heads of State and Government of the Organization of African Unity (OAU) held in Addis Ababa, Ethiopia, in July 1989 declared November 20 as Africa Industrialization Day. On December 22, 1989, the UN General Assembly also proclaimed this date to be Africa Industrialization Day. It was first observed on November 20, 1990. Each year, events around Africa Industrialization Day concentrate on a particular theme.

on industrialization, which also featured prominently in recent continental plans, such as the Common African Position (CAP) on the Post-2015 Development Agenda and Africa Agenda 2063 (African Union 2013b).⁴⁷

At the global level, industrialization is being reinvigorated as part of the Post-2015 Development Agenda. The Open Working Group (OWG) recognized that quality growth and jobs should be central to a new development framework beyond 2015 and accordingly has proposed Goal No. 9 as part of the 17 Sustainable Development Goals (SDGs) on building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation that accords industrialization a pride of place.

What is needed is to sustain the current momentum and move from rhetoric to action. Africa is already demonstrating its resilience despite considerable external challenges and taking advantage of emerging opportunities. Several countries are showing that they can sustain a trajectory of economic growth and beat the “resource curse” through prudent macroeconomic policies adopted in the last two decades. Five countries were among the ten reformers in the 2015 Doing Business Ranking (see Diop, Yong, and Shide 2015). Foreign direct investment surged to a record \$56 billion in 2014, driven by international and regional market-seeking investments as well as infrastructure investments, according to UNCTAD’s World Investment Report 2014.

As a result of the slowing down of emerging market growth and China’s rebalancing trouble, the continent is becoming more attractive to

investors seeking to take advantage of its one billion people. Manufacturers are already looking to countries such as Ethiopia, Kenya, and Rwanda as a result of rising production costs in Asia. A Chinese firm, the Huajian shoe factory, which opened in Ethiopia in 2012 as a result of a combination of cheap labor and electricity and a government committed to attracting foreign investment, is already showing that Africa can indeed become a global manufacturing hub. Apart from becoming profitable in its first year of operation, the company, which currently employs about 600 people, has committed to invest \$2 billion over the next decade to create a light manufacturing special economic zone in Ethiopia, creating about 30,000 jobs in Addis Ababa by 2022. Other African countries need to latch on to these developments and close the convergence gap with the rest of the world by reviving industrialization, among other measures.

This chapter reviews Africa’s effort toward the renewal of industrialization over the past several years and proposes a new approach to industrial policy for Africa. The chapter is divided into five sections. After this introduction, the second section builds a case for Africa’s industrialization and assesses the current state of the industry. Section 3 introduces the past industrial strategies and their outcomes. Section 4 provides an outline for a new industrial policy for Africa.

The Case for African Industrialization

Industrialization is crucial to economic development. Virtually all cases of high, rapid, and sustained economic growth in modern economic history

⁴⁷ The Common African Position is the outcome of intense consultations by the High-Level Committee (HLC) comprising ten heads of state and government and was constituted in May 2013 to sensitize and coordinate the activities of African leaders and build regional and intercontinental alliances for the Post-2015 Development Agenda. The Common African Position was adopted at the 22nd Summit of African Union Heads of State and Government, held in Addis Ababa, Ethiopia, January 21–31, 2014. The document groups Africa’s development priorities into “six pillars.” Pillar 1, on structural economic transformation and inclusive growth, has diversification, industrialization, and value-addition as one of the main goals.

have been associated with industrialization, particularly manufacturing (Szirmai 2009), while countries that are struggling to develop—including several African countries—are also the weakest in the area of industrial development. It is generally acknowledged that industry is most often the leading high-productivity sector. It is a high-value-added sector into which labor can flow. Ajakaiye and Page (2012) indicate that the average manufacturing–agriculture labor productivity ratio for low-income Africa is 2.5 to 1. Manufacturing also easily benefits from economies of scale as it expands, in contrast to either agricultural or purely extractive activities, which experience shortage in land, water, or other resources (Monga 2012).

Industry’s potential is virtually unlimited, especially in an increasingly globalized world. Empirical evidence indicates that economies with more diverse and sophisticated industrial sectors tend to grow faster. Only in exceptional circumstances, such as an extraordinary abundance of land or resources, have countries succeeded in developing without industrializing (UNIDO 2009). Even then, these countries had to carefully navigate through effectively managing the resource curse and the Dutch-disease syndrome.

Until recently, industrialization was the quickest means for a country to transform to a middle-income or developed economy through its contribution to productivity, innovation, and trade. The East Asian economies were able to transform themselves into industrial powerhouses within a generation, and the unprecedented pace of industrialization in Brazil, Russia, India, China, and South Africa (BRICS) has lifted millions out of poverty. Since initiating market reforms in 1978, China has successfully led the fight against poverty in the world by lifting more than 600 million people out of poverty on the heels of rapid economic growth, sustained by industrialization.

This conventional path to development is becoming much more difficult to actualize in other regions. Industry, especially manufacturing, has transformed in several ways, especially with the dominance of global supply chains. As Rodrik (2014) recently established, industry has become much more capital and skills intensive, with diminished potential to absorb large amounts of labor released from low-productivity agriculture. Not surprisingly, several developing countries in Latin America and SSA are witnessing what Rodrik (2015) also described as premature deindustrialization and the atypical transformation from agriculture to low-value services, the so-called “tertiarization” that has so far failed to deliver quality jobs.

Informal manufacturing is also beginning to play a major role in generating employment, despite the relatively low productivity exhibited by informal enterprises. McMillan (2014) has shown that manufacturing employment in the informal sector increased from a little over 300,000 to 1.6 million in Kenya between 1990 and 2007, while the formal sector employed only 11 percent of the labor force. This trend also holds sway in Nigeria with the recently released rebased figures where the informal sector accounted for about half of the 11 percent of the workforce engaged in manufacturing.

A major issue for Africa is to what extent services can play the role that manufacturing did in the past. The available evidence is currently mixed and the jury is still out. While Ghani and O’Connell (2014) argue that services can indeed be a growth escalator, providing enormous space for catching up and convergence, skeptics like Rodrik (2014) posit that services can hardly deliver rapid growth and good jobs the way manufacturing does, despite dominating the GDP in several low-income countries as a result of two contravening factors. First, services are highly skilled-intensive sectors

employing high-wage and comparatively few skilled workers, a rarity in several developing countries that mostly have unskilled workforces. Second, the sector in several developing countries is still dominated by nontradable services, such as retail trade and housework, operating at low margins and low levels of productivity. The envisioned productivity gains are ultimately self-limiting because they will push down costs and profitability, except when backed by simultaneous and complementary gains in productivity in the rest of the economy.

What is clear is that Africa needs to industrialize massively to transform its economies structurally for several reasons. While Africa's economic performance in the last 15 years has been characterized as impressive, the seemingly positive growth outlook is not very credible, because "good growth" still needs to be translated into less poverty, reduced inequality, job creation, structural transformation, and technological upgrading.

The current slump in fuel and commodity prices has exposed yet again one of the major weaknesses of a number of African economies: their dependence on either too few export commodities or too few sectors. Such dependence makes many countries vulnerable to fluctuations in commodity prices, demand, and extreme weather events such as droughts and floods. Economic diversification thus holds great potentials to increase Africa's resilience, and the heavy reliance on primary products must be reduced; this requires a new and important role for manufacturing exports, which remain one of the most potent forces for economic growth. Manufactured exports act as a catalyst to transform the economic structure of countries from simple, slow-growing, and low-value activities to more productive activities that enjoy greater margins driven by technology and higher growth prospects (Amakon 2012). The potential benefits are even greater today

because manufactured exports represent the hub of technical progress in both developed and developing economies.

Global value chains (GVCs) are an important feature in today's global economy. Over the past decade, transnational companies have fragmented their production processes, taking advantage of advances in information and communication technology and regulation. This has allowed them to optimize their sourcing strategies through geographic reorganization and the separation of production stages to exploit different countries' comparative advantages along value chains. Africa is still an insignificant player in global trade in value-added, accounting for only 2.2 percent in 2011, though up from 1.4 percent in 1995, and at the low rungs of the ladder it does not guarantee structural transformation (UNECA 2015).

Participation in GVCs is key for Africa's transformation, and significant opportunities exist for upgrading to higher levels. African countries can further integrate into GVCs by opening up to trade, targeting regional and emerging markets, modernizing infrastructure, promoting local entrepreneurship, and investing in technical education (OECD 2015).

Relevance of Industry to Africa's Push toward Middle Income

There is no agreement or standard for classifying middle-income countries (MICs). Different organizations have developed various classifications based on national income, level of industrial development, trade openness, and other indicators. In the United Nations system, the category of middle-income countries is often used to describe developing and transition economies not categorized as least-developed countries.

A widely used definition is that of the World Bank, defining MICs through their per capita gross national income (GNI) and dividing the MICs into an upper and lower segment (see Nielson, 2011 and Bulman, Eden, and Nguyen, 2014). Using the World Bank updated income classification for the 2015 fiscal year, low-income economies are defined as those with a GNI per capita of \$1,045 or less in 2013; middle-income economies are those with a GNI per capita of more than \$1,045 but less than \$12,746; and high-income economies are those with a GNI per capita of \$12,746 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of \$4,125.

Using this classification, Africa has 24 out of the 102 middle-income countries worldwide that collectively account for more than half of UN memberships and nearly two-thirds of the world population.⁴⁸ These countries have very few commonalities. They have varying territorial sizes, population, political systems, levels of human and industrial development, and other social factors. Despite their impressive growth performance, MICs face myriad development challenges, including widespread poverty, rising inequality in income, and growing environmental pollution and degradation. They also confront the prospects of growth deceleration and falling into the so-called “middle-income trap,” a situation where countries get stuck in the middle-income group for a long period of time and do not move up.

Historically, the economic development of nations has been a long sequence from low income to middle income and then high income. The transition of an economy from low-income to middle-income status is a

major leap toward attaining the coveted high-income status and eventually catching up with the richest (Spence 2011).

It is estimated that of the 35 countries that have been low income since 1950, 30 of them are in SSA, 4 in Asia, and 1 in the Caribbean (Felipe, Kumar, and Galope 2014). They are obviously in a “low-level equilibrium trap” and need to urgently transition to middle income in the near future and avoid the middle-income trap. During the last two and a half decades, while many developing countries have enjoyed the benefits of transitioning, some rapidly, from a low-income country to a middle-income country, only 13 countries and economies have graduated into high-income country status (Jankowska, Nagengast, and Perea 2012).⁴⁹ This suggests that, at middle levels of income, economic growth and structural upgrading become more arduous. Escaping the middle-income trap is a function of structural transformation through diversification into a greater number of products, as well as movement into higher value-added products over time. Countries like South Korea have been able to exit from the trap as a result of rapid growth in industrialization.

Past Industrial Strategies and Outcomes

The debate on industrial policy and strategies has ranged over the last six decades or so and different approaches have emerged. Four broad categories can be identified: (1) import-substitution industrialization (ISI) policies; (2) export-oriented industrialization (EOI) policies, which include variants such as export processing zones (EPZs), special economic zones

⁴⁸ Cameroon, Cape Verde, Côte d’Ivoire, Djibouti, Egypt, Ghana, Lesotho, Monrovia, Nigeria, Republic of the Congo, São Tomé and Príncipe, Senegal, South Sudan, Swaziland, and Zambia are lower-middle-income countries; Angola, Algeria, Botswana, Gabon, Libya, Mauritius, Namibia, South Africa, and Tunisia are upper-middle-income countries.

⁴⁹ These countries and economies are Equatorial Guinea, Greece, Hong Kong, Ireland, Israel, Japan, Mauritius, Portugal, Puerto Rico, South Korea, Singapore, Spain, and Taiwan.

(SEZs), and industrial clusters; (3) resource-based industrialization (RBI) policies; and (4) industrialization through innovation (see Low and Tijaja 2013).

There have been numerous attempts and initiatives in the past to propel industrialization in Africa. While industrialization patterns, strategies, and policies in Africa are as varied as the countries themselves, the continent has no doubt experimented with all the approaches, especially the first three. In what follows, we review the major epochs, comparing developments in Africa with results in other developing regions.

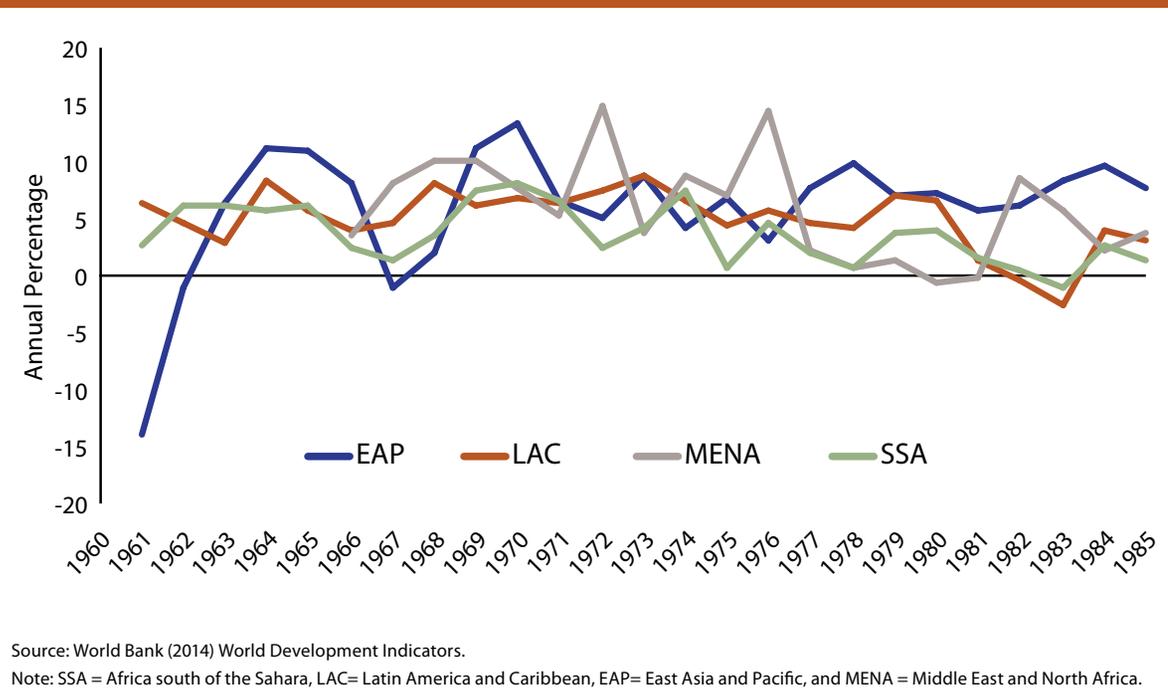
Immediate Post-Independence Era, 1960–1985

On attaining political independence, mostly in the 1960s, most African nations actively sought to promote industrialization as a means of closing the gap with the colonial administrators who previously discouraged industrial development. Industrialization was viewed as the surest means to hasten the transformation of African countries from agricultural to modern economies, create employment opportunities, raise incomes as well as living standards, and reduce vulnerability to terms of trade shocks resulting from dependence on primary commodity exports.

As in other developing country regions, while the initial focus was on consumer goods, there was the expectation that, as the industrialization process proceeded, the intermediate and capital goods needed by the

domestic consumer goods industry would also be domestically produced. Although there are country-specific differences in policies adopted, the implementation of import substitution industrialization (ISI) in Africa generally involved the following elements: (1) restriction of imports to intermediate inputs and capital goods required by domestic industries, (2) extensive use of tariff and nontariff barriers to trade, (3) currency overvaluation to facilitate the import of goods needed by domestic industries, (4) subsidized interest rates to make domestic investment attractive, (5) direct government ownership or participation in industry, and (6) provision of direct loans to firms as well as access to foreign

FIGURE 7.1—ANNUAL GDP GROWTH RATES: AFRICA AND OTHER DEVELOPING REGIONS, 1960–1985



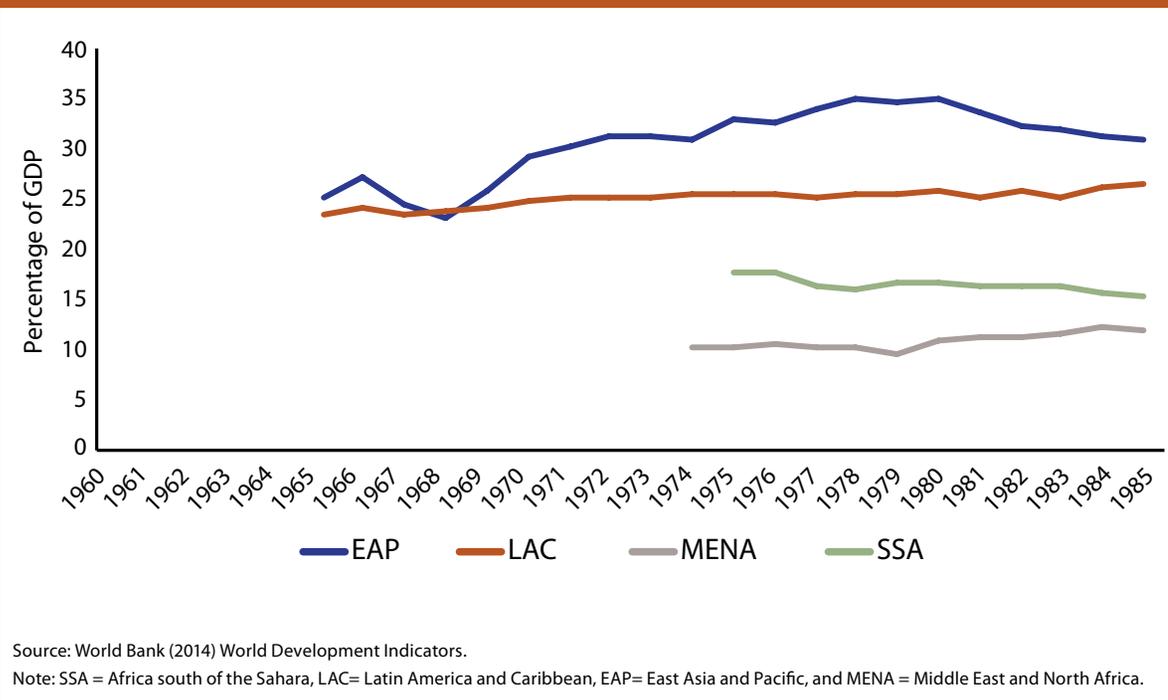
exchange for imported inputs (Mkandawire and Soludo 2003; UNIDO and UNCTAD 2011).

This development strategy seems to have been successful during the first one and a half decades of independence, as can be seen from Figure 7.1. GDP growth rate hovered around 4 percent on the continent and trended well with the other developing regions. By the beginning of the second half of the 1970s, SSA and Latin America and Caribbean (LAC) regions had definitely lost momentum, while the East Asia and Pacific (EAP) and Middle East and North Africa (MENA) regions continued to forge ahead.

As shown in Figure 7.2, the increase in contributions of manufacturing to GDP was quite steep in the case of EAP and least perceptible in the case of SSA. Just as economic growth in SSA lost momentum in the first 15 years of the post-independence era, the structural transformation that appears to have commenced during this period also plummeted thereafter. As a result, the much-desired development (growth plus structural transformation) did not materialize in Africa. In Asia, indications were already stark by 1985 that development had, indeed, been initiated.

However, it became evident in the late 1970s, with successive oil shocks and an emerging debt problem, that industrial development through the ISI model could not be sustained.

FIGURE 7.2—CONTRIBUTIONS OF MANUFACTURING TO GDP: AFRICA AND OTHER DEVELOPING REGIONS, 1960–1985



Structural Adjustment Programme Era (1986–1995)

The Structural Adjustment Programme (SAP) era in Africa commenced in the mid-1980s when many African countries lost the growth momentum of the first 15 years post-independence and also experienced severe balance of payments crises resulting from the cumulative effects of the first oil shock, the decline in commodity prices, and the growing import needs of domestic industries. To manage the crisis, many countries sought financial assistance from the International Monetary Fund (IMF) and the World Bank. African countries that obtained the financial support of the IMF and

World Bank had to adopt a SAP, which required them to implement certain policy reforms. As a result, the mid-1980s witnessed the formulation and implementation of wide-ranging economic policy reforms by most African countries at the behest of the International Financial Institutions (IFIs). The policy reforms included: (1) deregulation of interest rates, (2) trade liberalization, (3) privatization of state-owned enterprises (parastatals), (4) withdrawal of government subsidies, and (5) currency devaluation. A key objective of SAPs was to reduce the role of the state in the development process and give market forces a greater role in the allocation of resources. The assumption was that markets are more efficient than the state in resource allocation and that the appropriate role of the latter should be to provide an enabling environment for the private sector to flourish.

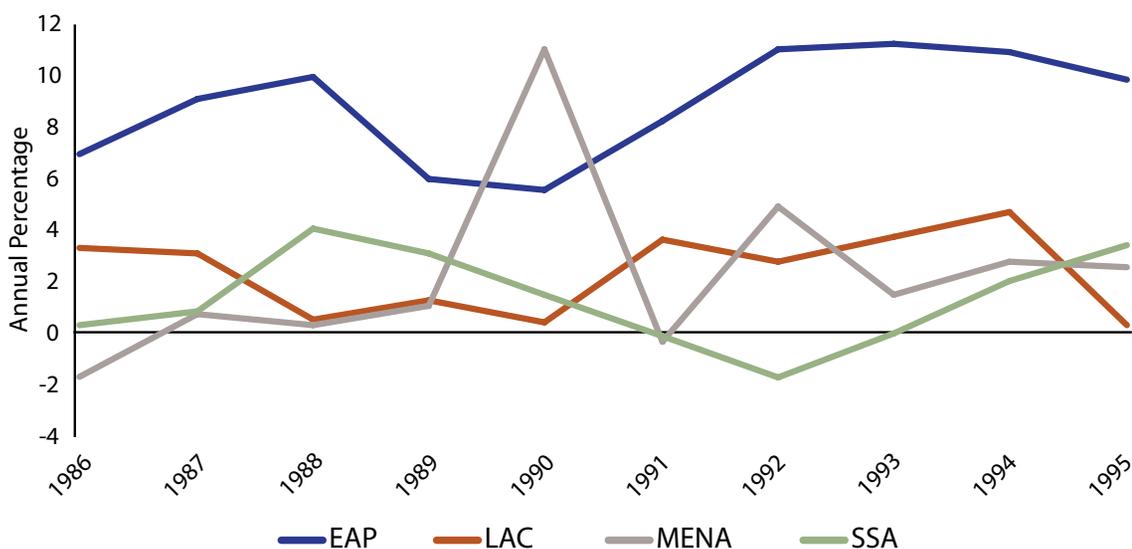
Despite the vigorous implementation of SAPs in many African countries, economic performance continued to lag behind those of other developing regions. Indeed, by the beginning of the 1990s, when the impact of SAP policies had become manifest, Africa had become the slowest growing region in the world (see Figure 7.3).

Clearly, SAP policies failed to deliver on development in Africa, the growth revival of the first half of 1990s notwithstanding. African countries curtailed specific policy efforts to promote industrialization and focused on

removing anti-export biases and furthering specialization according to comparative advantage. It was expected that competitive pressures would revitalize economic activity by leading to the survival of the fittest. But while these policies were certainly intended to have structural effects, the conventional view is that they did not boost industrialization in the region (Soludo, Ogbu, and Chang 2004).

The contributions of manufacturing to GDP in Africa, which had increased slightly up to the end of the 1990s, started to decline thereafter (see Figure 7.4). The same is true with greater intensity in the case of

FIGURE 7.3—ANNUAL GDP GROWTH RATES: AFRICA AND OTHER DEVELOPING REGIONS, 1986–1995



Source: World Bank (2014) World Development Indicators.

Note: SSA = Africa south of the Sahara, LAC= Latin America and Caribbean, EAP= East Asia and Pacific, and MENA = Middle East and North Africa.

LAC. On the other hand, the picture is quite different in EAP and MENA regions, where manufacturing contributions remained high and rising at different degrees. Evidently, the declining contributions of manufacturing to GDP in Africa are stark manifestations of the de-industrialization that occurred during the SAP period in the region. Africa suffered serious de-industrialization, which swelled the rudimentary service sector dominated by low-productivity distributive trade activities, and poverty became a serious concern in the region (Ajakaiye and Jerome 2014).

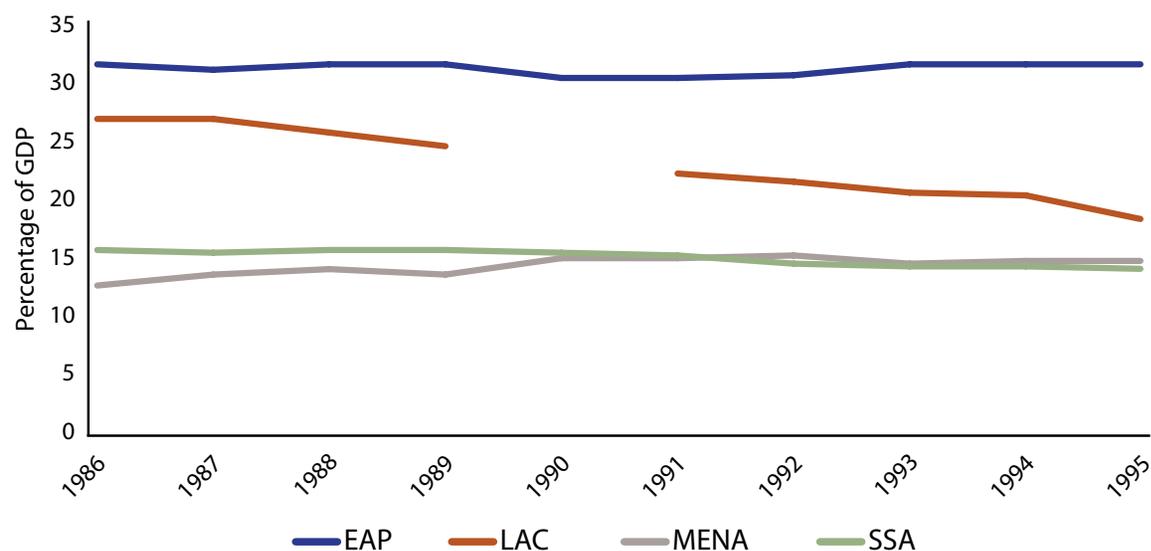
New Orthodoxy Era (1996–2010)

By the end of the 1990s, the IFIs had started to reconsider their approaches and practices in the developing countries. Eventually, a joint initiative launched by the IFIs at the end of 1999 put the fight against poverty at the heart of growth and development policies. As a result, low-income countries wishing to apply for financial aid from either of the two organizations, or for debt relief under the Heavily Indebted Poor Countries (HIPC) Initiative, were required to draw up poverty-reduction programs known as Poverty Reduction Strategy Papers (PRSPs). At the same time, the UN was actively

engaged in setting the millennium development goals (MDG)—culminating in the Millennium Declaration in 2000 (AUC 2013), with poverty reduction at its heart—while remaining silent on the issue of structural transformation. A hallmark of these initiatives is the continued reliance on market fundamentalism to undergird development policies, and state intervention remained an anathema (Ajakaiye and Jerome 2014).

Since the turn of the millennium, however, the external environment has shifted in favor of developing countries. Not only did the volume of capital inflows increase, but also commodity prices began to rise sharply as a result of increasing demand by China, while some countries also saw remittances increase. Paradoxically, this shift and the global economic

FIGURE 7.4—CONTRIBUTIONS OF MANUFACTURING TO GDP: AFRICA AND OTHER DEVELOPING REGIONS, 1986–1995



Source: World Bank (2014) World Development Indicators.

Note: SSA = Africa south of the Sahara, LAC= Latin America and Caribbean, EAP= East Asia and Pacific, and MENA = Middle East and North Africa.

and financial crises opened up the space for developing countries to explore a much wider set of policies than those endorsed by the Washington Consensus to shape their growth and development prospects and to build closer economic and political ties with each other through renewed South-South cooperation (Salazar-Xirinachs et al. 2014).

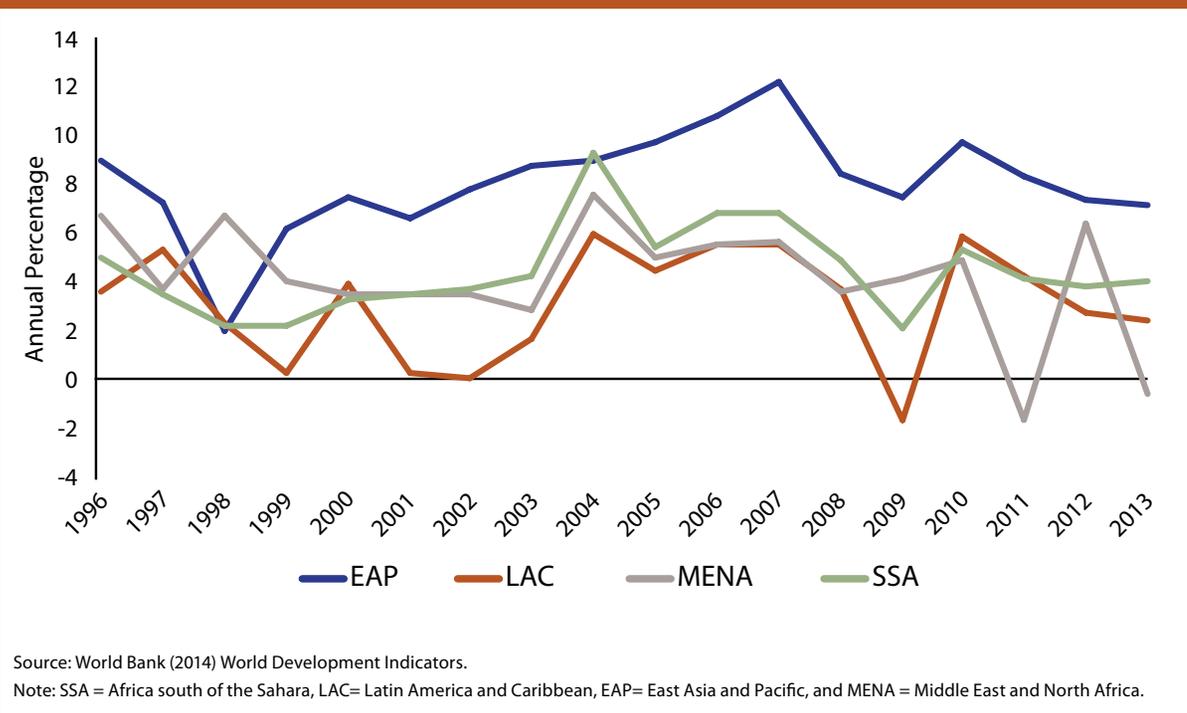
In Africa, several countries experienced a welcome surge in growth in the years immediately after 2000. Figure 7.5 shows that Africa's recovery, which started in 1999, was sustained such that by the beginning of the 21st century, Africa had become the second fastest growing region in the world, next to Asia. However, much of this growth was associated with a commodity boom and with extractive industries.

The resumption of growth in SSA, though impressive, is yet to translate into the economic transformation that provides the basis for sustained, rapid growth. The shares of manufacturing and formal-sector employment have still not recovered to the 1980 levels (Noman 2013), (see Figure 7.6).

Indeed, some countries underwent structural changes that saw productivity fall, with some productive sectors shrinking and excess labor moving from higher to lower productivity sectors and to informality (McMillan and Rodrik 2011). In fact, most African countries south of the Sahara experienced premature de-industrialization:

manufacturing value-added as a percentage of GDP declined from 15 percent in 1990 to 10 percent in 2008 (UNIDO and UNCTAD 2011), despite contrary evidence provided by McMillan (2014) that the manufacturing sector has started to flourish. This is partly attributable to the pace and depth of trade liberalization, exacerbated by a neglect of investment in agriculture and especially in supporting small farmers. These policy mistakes have been widely recognized in the last few years and there has been a renewed appreciation of the importance of an industrial policy to achieve more

FIGURE 7.5—GDP GROWTH RATES: AFRICA AND OTHER DEVELOPING REGIONS, 1996–2013



economically sustainable and inclusive growth paths (Salazar-Xirinachs et al. 2015; Yong 2014). This commitment to industrial policy has been particularly strong in countries such as Rwanda, Ethiopia, and South Africa. Meanwhile, Regional Economic Communities (for example, East African Community (EAC), Southern African Development Community (SADC), and Economic Community of West African States (ECOWAS) are also introducing industrial policies as an essential pillar of their economic integration strategies.

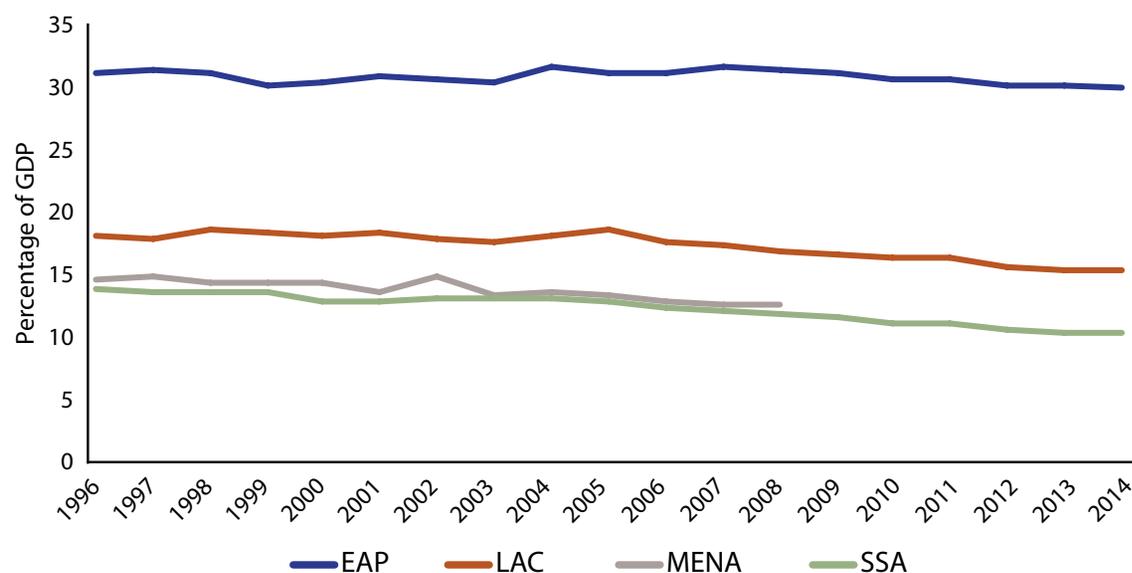
Current Status of African Industry

The record of industrialization in Africa has been profoundly disappointing. The majority of countries continue to have a weak industrial base without the structural change and diversification experienced by other developing countries. Not surprisingly, Africa lags behind other developing regions in industrial performance. Several key statistics from the United Nations Industrial Development Organization (UNIDO) are illustrative.

Africa's share of world manufacturing output was a paltry 1.49 percent

in 2012, compared to 10 percent of China's manufacturing value-added. Manufacturing as a share of GDP for Africa was only 10 percent in 2012, in contrast to 23 percent in Asia and the Pacific and 15 percent in Latin America (see Table 7.1). The global average was 16.7 percent. In regional terms, West Africa had the lowest percentage share of manufacturing in GDP (5.2 percent), followed by East Africa (7.2 percent), Central Africa (7.3 percent), North Africa (10.8 percent) and southern Africa (12.6 percent). There is only one country (Swaziland) where manufacturing as a share of GDP exceeds 25 percent, the benchmark for considering a country as having achieved the critical threshold of industrial take-off. This figure ranges from 0.3 percent in Equatorial Guinea to 30.2 percent in Swaziland. Manufacturing, value-added (MVA) as

FIGURE 7.6—CONTRIBUTIONS OF MANUFACTURING TO GDP: AFRICA AND OTHER DEVELOPING REGIONS, 1996–2014



Source: World Bank (2014) World Development Indicators.

Note: SSA = Africa south of the Sahara, LAC = Latin America and Caribbean, EAP = East Asia and Pacific, and MENA = Middle East and North Africa.

TABLE 7.1—MANUFACTURING INDICATORS

Region	MVA (2012) in \$US 000	MVAPC (in \$US 000)							MVA 2012 (% of GDP)	MVA 2012 (% of world total)
		1990	1995	2000	2005	2010	2011	2012		
Africa	132,456,691	122.08	111.47	117.32	122.03	127.27	126.92	129.51	9.989	1.49
North Africa	48,943,543	193.43	198.29	229.34	247.87	280.41	275.60	287.54	10.843	0.55
Central Africa	4,535,131	113.15	86.50	98.46	103.97	100.74	102.11	104.05	7.343	0.05
West Africa	13,954,772	41.29	36.96	38.46	39.36	41.94	41.97	43.56	5.224	0.16
East Africa	5,243,059	22.02	20.71	20.36	21.48	24.69	25.45	25.96	7.244	0.06
Southern Africa	59,780,185	227.73	196.10	198.47	205.90	205.62	207.69	208.60	12.628	0.67
Africa south of the Sahara	13,954,772	41.29	36.96	38.46	39.36	41.94	41.97	43.56	5.224	0.16
African LDCs	15,810,077	28.24	23.97	26.07	28.88	31.93	32.57	33.04	7.706	0.18
Asia and the Pacific	3,811,507,105	440.44	492.66	564.26	681.36	844.20	871.97	912.28	23.007	42.80
South Asia	258,270,165	55.20	67.91	78.83	101.06	140.80	148.58	153.97	15.351	2.90
North America	1,959,915,077	4,040.65	4,456.92	5,291.22	5,702.58	5,500.09	5,529.68	5,590.37	13.246	22.01
Latin America	516,788,049	750.98	772.22	838.94	856.78	891.37	912.83	859.02	15.069	5.80
Europe	2,483,933,716	2,585.88	2,493.61	2,853.21	3,054.51	3,013.44	3,080.20	3,030.50	14.470	27.89
World	8,904,600,638	941.13	956.46	1,075.69	1,174.07	1,240.35	1,264.17	1,277.10	16.711	100.00

Source: Computed from UNIDO, (2015) Industrial Statistics database.

Notes: MVA = Manufacturing value-added, MVAPC = Manufacturing value-added per capita, Africa LDCs = Africa's least developed countries.

a proportion of GDP is still less than 10 percent in 30 African countries (Jerome 2013). Within Africa, the distribution of manufacturing activity is highly skewed, with just one country, South Africa, accounting for 38.9 percent of total MVA, followed by Egypt (15.4 percent).

In 2010, Africa's share of global manufacturing exports was 1 percent, lower than India's share of 1.4 percent and China's 15 percent. High technology exports account for only 3.5 percent of manufactured exports from Africa compared to 32 percent in East Asia and the developing country average of 22 percent. The export composition of African countries continues to be dominated by primary rather than processed or semi-finished products.

TABLE 7.2—MANUFACTURED EXPORTS⁵⁰ IN MILLION US\$ AND AS SHARE OF EXPORT OF GOODS AND SERVICES FOR SELECTED REGIONS

Year	East Asia and the Pacific		Europe and Central Asia		Latin America and the Caribbean		Middle East and North Africa		Africa south of the Sahara	
	Manufactured exports	As share of exports of goods and services (%)	Manufactured exports	As share of exports of goods and services (%)	Manufactured exports	As share of exports of goods and services (%)	Manufactured exports	As share of exports of goods and services (%)	Manufactured exports	As share of exports of goods and services (%)
2000	1,518,599	76.0	2,065,581	59.8	214,043	43.9	47,463	13.1	25,366	21.7
2001	1,371,318	74.6	2,101,329	60.2	207,653	43.2	45,967	13.7	24,121	22.1
2002	1,486,787	75.4	2,259,118	60.6	208,006	42.9	56,755	16.1	31,119	26.6
2003	1,753,791	76.2	2,686,177	60.4	222,532	42.0	71,653	16.6	34,947	24.1
2004	2,171,872	76.1	3,225,041	60.0	271,986	42.8	88,574	15.7	-	-
2005	2,480,041	75.4	3,523,350	59.4	324,844	43.1	99,917	13.3	-	-
2006	2,863,700	75.0	3,971,544	58.8	375,170	42.5	139,690	15.5	62,493	22.2
2007	3,286,692	74.0	4,595,494	57.7	444,484	45.0	134,453	12.8	75,327	23.4
2008	3,608,089	71.6	5,107,547	56.8	467,191	41.3	188,433	13.5	97,753	24.3
2009	3,005,649	71.6	3,892,052	54.8	352,704	38.7	168,793	17.0	67,978	22.6
2010	3,837,327	71.3	4,419,394	55.6	443,881	37.9	224,876	18.6	98,701	24.2
2011	4,366,415	69.0	5,254,316	56.2	536,898	39.2	-	-	112,581	22.0
2012	4,515,379	68.8	5,022,300	54.8	545,483	39.3	-	-	115,957	22.6
2013	4,642,382	68.9	5,237,074	54.8	557,851	40.0	-	-	116,335	25.2
2014	4,873,776	70.2	5,513,031	56.5	625,302	45.5	-	-	-	-

Source: Computed from UNIDO, (2015) Industrial Statistics database.

⁵⁰ Manufactured exports as a share of merchandise exports in current US\$.

Some progress has been recorded in Africa's manufacturing export performance, but it remains concentrated in a few countries even though the upward trend in African manufactured exports is in play in several countries across the continent. As shown in Table 7.2, manufactured exports in SSA increased substantially from \$25,366 million in the year 2000 to \$116,366 million in 2013. Nonetheless, this is far lower than what is obtainable in all other developing regions of the world. As a share of total merchandise exports, the trend for Africa south of the Sahara hovers from 21.7 percent in 2000 to 25.2 percent in 2014, performing only better than the Middle East and the North African region.

A cursory examination of Table 7.3, which presents manufactured exports for selected economies, indicates that South Africa is clearly an outlier, contributing as much as 63.6 percent of SSA's total manufactured exports, though the figure has declined considerably over the years, reaching 37 percent in 2014. Botswana has also demonstrated relatively good performance and the trend, though declining, has been relatively stable, from 9.4 percent of SSA's share in 2000 to 5.7 percent in 2013. Mauritius's share has been on the decline, from a peak of 5 percent in 2000 to 1.4 percent in 2013.

Africa's industrialization has been weak and inconsistent due to myriad factors, including inadequate and poor-quality infrastructure; skills shortage evident in two specific areas, soft skills (entrepreneurial and managerial skills) and hard skills (industrial and technical skills), which are both essential for promoting sustainable industrialization; technological deficit, which is reflected in lack of scientific and technological skills; and business and regulatory environments, despite marked improvement in recent years. Even with these constraints, there are new opportunities for inclusive and sustainable industrialization in Africa.

Toward a New Industrial Strategy for Africa

Africa is now being recognized as the most dynamic growth region and the continent with which to do business. At least six out of the fastest growing economies are in Africa. Africa's average GDP growth rates since 2001 has averaged about 5 percent, but it has not translated into jobs for the teeming youth population. Thus, the reality is that in 2014, SSA was the world's poorest region, with just over 50 percent of its population living on less than \$1.25/day. In fact, the income gap between Africa and other developing regions has been widening over the past 40 years, implying that other regions are growing even faster. Growth in most other regions is driven by structural change of the economy, manufacturing, and value-added services; however, in Africa, growth has largely been driven by a commodity exports boom—largely minerals and oil.

In the analysis provided in the section on past policy interventions, it is clear that for decades, policy solutions for industrial transformation in Africa were prescribed and focused on microeconomic management. In addition, these were followed by numerous action plans, without due support for institutional capacity building at continental, regional, or country levels. As Rodrik (2004) posited, strong, well-functioning institutions are central for sustaining growth, though not necessary to catalyze it. In this respect, it is important for African countries to explore a new approach to industrial policy.

Three key issues need to be taken into consideration in developing a new industrial strategy. First, the new industrial strategy must target macroeconomic foundations within the context of sound macroeconomic strategy; second, African countries must realize that the world in the 21st

TABLE 7.3—MANUFACTURED EXPORTS FOR SELECTED COUNTRIES (million US\$)

Year	South Africa		Mauritius		Nigeria		Botswana	
	Manufactured exports	SSA share (%)						
2000	16,145	63.6	1,258	5.0	43	0.2	2,396	9.4
2001	15,657	64.9	1,208	5.0	56	0.2	2,274	9.4
2002	18,495	59.4	1,308	4.2	901	2.9	2,205	7.1
2003	21,215	60.7	1,397	4.0	497	1.4	2,427	6.9
2004	26,569	-	1,357	-	-	-	3,008	-
2005	29,249	-	1,228	-	-	-	3,777	-
2006	30,750	49.2	1,492	2.4	786	1.3	3,621	5.8
2007	36,006	47.8	1,385	1.8	1,493	2.0	3,793	5.0
2008	42,186	43.2	1,366	1.4	4,713	4.8	3,777	3.9
2009	29,284	43.1	1,245	1.8	2,036	3.0	2,695	4.0
2010	44,466	45.1	1,360	1.4	5,616	5.7	3,733	3.8
2011	49,750	44.2	1,653	1.5	2,905	2.6	5,200	4.6
2012	47,537	41.0	1,635	1.4	3,302	2.8	5,278	4.6
2013	44,019	37.8	1,686	1.4	3,493	3.0	6,663	5.7
2014	45,141	-	2,063	-	-	-	7,014	-

Source: Computed from World Bank, (2015) World Development Indicators.

Note: SSA = Africa south of the Sahara.

century and specifically in 2015 is a very different place than that in the 1970s and 1990s; and third, strong institutions must form the foundation for a policy action agenda. In this respect, Africa's industrialization policy should focus on addressing key binding constraints that have inhibited the structural transformation of African economies through industrialization. The key binding constraints are discussed in the following paragraphs.

Investing in Infrastructure

Poor infrastructure—particularly energy, transport, and water supply—is a major binding constraint to industrial development in Africa. Good infrastructure enhances the competitiveness of an economy and generates a business environment that is conducive to industrialization and economic growth. Unfortunately, road infrastructure and road density in several African countries are poor compared to other parts of the world. In addition, access to modern forms of energy is one of the most pressing challenges facing the continent. It is estimated that the total installed capacity for power generation in 43 countries of SSA (minus South Africa) is less than or about the capacity in Poland and in the State of New York. Outside South Africa, modern energy consumption in SSA is around 1 percent of OECD levels and 82 percent of households rely on solid biomass (charcoal, wood, or animal waste) for cooking. Where electricity exists, frequent interruptions cause 2 to 3 percent loss of GDP and 6 percent loss to turnover in the formal-sector firms.

Africa's infrastructural networks are not only deficient in coverage and quality, but as the African Infrastructure Country Diagnostic (AICD) has revealed⁵¹, the cost of the services provided is also exceptionally high by global standards. Whether for power, water, road freight, mobile telephones, or Internet services, the tariffs paid in Africa are several times those paid in other parts of the developing world. The explanation for this is sometimes due to genuine higher costs and at other times due to high profit margins. For example, Nigeria's leading mobile provider, MTN Nigeria, spends in excess of \$5.55 million on diesel to power its 6,000 generator plants across the country each month (Jerome 2011). The weak infrastructure base consequently disrupts the creation of a competitive industrial sector, resulting in higher production and transaction costs in Africa.

At the continental level, Africa must promote and push for the full implementation of the Plan for Infrastructure Development in Africa (PIDA), which has at its core the scaling up of investments in the energy sectors. Without an ambitious transformation of Africa's infrastructure, industrialization will be delayed.

Improving the Business Environment

African countries should design and implement policies that improve the quality of the business environment. In particular, there is a need to design and implement a broad range of minor reforms to reduce bureaucracy, such as the time to register companies, register and complete property transactions, gain access to land, and so on. In this regard, the role of

⁵¹ The Africa Infrastructure Country Diagnostic (AICD) represents an unprecedented effort to collect detailed economic and technical data on African infrastructure in relation to the fiscal costs of each of the sectors, future sector investment needs, and sector performance indicators. Anchored by the World Bank, the main findings were synthesized in a Flagship Report entitled *Africa's Infrastructure: A Time for Transformation*, published in November 2009.

the state is vital. As proposed by Lin's (2011) New Structural Economics, the role of the state in promoting industrialization should focus on facilitating investment for industrial development. The new structural economics stresses the central role of the market in resource allocation and advises the state to play a facilitating role to assist firms in the process of industrialization by addressing externality and coordination issues. This new industrial policy focus is therefore in contrast to the old structural economics that advocate development of policies that go against an economy's comparative advantage and advises governments to develop advanced capital-intensive industries through direct administrative measures and price distortions.

To enable the business environment, specific policies and strategies need to be put in place to promote private enterprise. The new industrial policy approach for Africa must therefore emphasize "created" competitiveness in addition to "inherited" comparative advantages (natural resources and geography). In this respect, policy reforms in the business environment should be the basis for creating conditions that would help enterprises establish, grow, and compete internationally. The creation of an overall business environment for industrialization requires favorable business factors that are not determined by the internal capabilities of the enterprise. The most important of these business environment factors are macroeconomic, political, and social stability; favorable exchange rates; stable financial systems, institutions, and governance; land tenure; and advisory and support services.

Investing in Science, Technology, and Industrial Training

Science, technology, and skills form the backbone of industrial development. The inability of African countries to participate in the production of high-value-chain goods is mostly linked to the lack of scientific and technological skills. At present, Africa's gross domestic expenditure on research and development (GERD) is less than 1 percent. Only South Africa is approaching the target of a 1 percent GERD/GDP ratio, the level prescribed by the United Nations Educational, Scientific and Cultural Organization and the African Union. More worrisome is that about 29 countries in Africa either have no records or do not allocate funds at all to research and development.

Poor spending on research and development is reflected in the neglect of research in African universities. Universities are the citadels of higher learning and, quite often, the centers of research in science and technology. Over the years, African governments, spurred by donors, have focused on boosting primary and secondary education, thus neglecting universities. The end result is the growing evidence of quality problems with universities in Africa. Only seven universities (five in South Africa) featured in the top 1,000 universities in the 2015 Webometrics Ranking of World Universities. These are the universities of Cape Town (328), Stellenbosch (462), Cairo (474), Pretoria (494), Witwatersrand (563), KwaZulu-Natal (830), and Nairobi (855).⁵²

⁵² For details, visit http://www.webometrics.info/en/Ranking_africa. Accessed June 29, 2015

African countries need to put in place policies and strategies that focus on skills development in specific industrial sectors to promote industrialization. This will require strengthening science, technology, and innovation (STI) policies and related infrastructure. A strengthened STI infrastructure is crucial for accelerating the productivity enhancement that is required for rapid and sustained industrial growth in Africa. In this respect, there is need for new and better-formulated STI policies, strategies, and, above all, implementation. This is a precondition to achieving dynamic and broad-based industrial development.

The availability of competent and qualified skilled labor is also a growing concern. For manufacturing industries to be globally competitive, employers must have not only a good pool of professional engineers and manufacturing managers but also access to well-trained entry-level and mid-skilled production employees and artisans. While the number of training institutions has increased over the years, unfortunately the educational system and workforce training programs do not deliver a sufficient number of qualified workers in several sectors of manufacturing. Thus, skills formation policies must be aligned with industrial development policies and strategies.

Sustainable Development of the Private Sector

Sustainable development of Africa's private sector is needed to bridge the industrial gap on the continent. African policymakers have recognized that for growth to be sustainable over the longer term, it needs to be underpinned by a vibrant private sector. However, the formal private sector in Africa remains limited and encumbered by several constraints, including the high cost of doing business, infrastructure bottlenecks, and critical skills shortages. Although considerable variation exists across Africa, five distinctive structural deficits of the region's enterprise structure command

the attention of policymakers: (1) widespread and rising informality, (2) a "missing middle" and lack of upward mobility of enterprises, (3) weak inter-firm linkages, (4) low levels of export competitiveness, and (5) lack of innovation capabilities (UNIDO/GTZ 2008).

The government has a central role to play in private-sector development beyond deregulation and formulation of industrial and technology policies. In contrast to the earlier failed efforts at industrial policy, African states must learn to work with the market. The debate should move away from whether there is a role for government in the industrialization process; rather, it should focus more productively on what its exact role in promoting industrialization and structural change should be. The practical experiences of most transforming economies suggest that an appropriate mix of both horizontal and vertical approaches is more likely to succeed. It is increasingly clear that the success of the East Asian Tigers often involved the use of both vertical and horizontal policies where appropriate. Public action needs to move beyond the regulatory reform agenda pushed by the international financial institutions to address the physical, institutional, and knowledge constraints limiting Africa's industrial development. Fiscal incentives should be time-bound, reward first movers, and be subject to rigorous evaluation. Measures should also be designed to improve state-business relations, support innovative entrepreneurship, strengthen intra-firm specialization and linkages, promote exports, and improve financial services with a view to addressing the deficits of Africa's private sector.

A number of African countries have successfully experimented with forging close coordination with the private sector. Gebreeyesus and Iizuka (2011) document the experience of the Ethiopian cut-flower industry, in which government played an active and apparently successful role. Monthly meetings involving representatives of the flower producers took

place with both the minister of industry and the prime minister. Firms were encouraged to identify barriers to their growth and action points were agreed upon. Significantly, the relevant government agencies took prompt and effective action to address the constraints, and progress was monitored in succeeding meetings.

Intensifying Regional Integration within Africa

African countries through the African Union must intensify their efforts to achieve regional integration. Regional integration can be an important instrument for achieving full economies of scale in the adequate production of raw materials and the provision of key infrastructure, such as roads, electricity, water, and information and communications technology. In particular, special effort should be given to completing transportation corridors and locating industrial parks or zones in physical proximity to such corridors. Also, through better coordination between the key institutions and key stakeholders of different countries, regional integration can facilitate harmonization in critical areas, such as policies, trade, institutions, science and technology, product standards, and the establishment of simplified customs procedures and financial services.

Financing Africa's Industrialization

Industrialization requires long-term financing, usually by the private sector, while the public sector provides the enabling environment. Long-term investments can be promoted most effectively in countries or areas that enjoy an investment-friendly and enabling environment. There are two clear paths toward financing industrialization in Africa: through domestic resource accumulation, particularly income from natural resources, and through industrial partnerships.

Although several African countries are endowed with significant mineral resources, many of them are exploiting them without any clear long-term industrial policies for value-addition locally. It is a fact that no country, even the developed countries such as the United States, Australia, Canada, and Norway, that is endowed with natural resources has transformed this “inherited wealth” (the natural resources) into “created wealth” without highly developed manufacturing industries. These countries would not have become rich only by exporting raw materials, as is done today by several African countries. It is in this respect that many poor African countries with natural resources never see any significant return in terms of equitable growth and development. Accumulated income from national resource trade could be used to finance industrialization; however, there is a need for policy response at the national, regional, and even global levels. Income generated from resource trade could form the basis for domestic resource mobilization, sovereign wealth funds, and leveraging development finance and foreign direct investment to finance industrial projects.

The second source of financing industrialization in Africa is through “partnerships for industrialization.” This involves strategic partnerships between African countries and other countries in the south or north that are focused on developing specific industrial projects in Africa. In such partnerships, industrialization can be facilitated through regional trade agreements, technology transfer, and foreign direct investment. South-South trade has emerged as one of the most dynamic elements of global manufacturing and trade (UNIDO 2006). The growing interdependence of developing Asia was a result of intensified intra-industry linkages and cooperation due to integrated production networks, subcontracting arrangements, and regional trade agreements (UNIDO 2006). This makes the establishment and facilitation of innovative regional value chains for

intensified intra-industry linkages and regional trade agreements important items in the revised agenda for industrial and trade cooperation initiatives. African countries can also promote industrial cooperation with developed countries by intensifying south-south trade.

Conclusions

Industrialization has contributed little to Africa's economic growth over the years. In particular, there has been a disconnect between policy, strong commodity-driven economic growth, employment, and social development. This situation has further been compounded by the failure of most African economies to structurally transform, thus the failure to experience inclusive growth. The volatile commodity prices, which highlight the strong economic growth without concurrent industrial development and structural transformation, are cause for concern.

As has been demonstrated in developed economies, structural transformation is associated with the reallocation of resources, especially through new investment, from low to higher productivity activities, typically from agriculture to industry and modern services, leading to higher economywide productivity and progressively raising income. Much of Africa, however, has seen the opposite, as resources moved from higher to lower productivity sectors, slowing growth in national productivity. In domestic and international markets, African countries remain marginal players for their manufactured goods, with a negligible share of manufactured exports in world exports, compared even to other developing countries.

As a result of a low industrialization index, Africa's share in global trade is way below potential, at around 3.3 percent, and oil, metals, and minerals

dominate its exports. Intra-African trade remains low compared to other regions due to trade barriers. Despite the high potential for Africa to increase intra-African trade in agricultural products, this is not happening, not only because of trade barriers but also because of the low value-addition and manufacturing of agricultural products, both food and nonfood. Even with several African countries' dependence on agriculture as a major source of income and food for the majority of its citizens, there is little manufacturing, and thus agriculture's contribution to sustainable poverty reduction has been minimal.

It is becoming increasingly more difficult than ever for the poorer developing countries to foster industrial development and structural change as they face a more complex and daunting set of circumstances compared to the developing countries that embarked on industrialization in the 1960s. New challenges that have arisen include the shrinking of policy space in the present international order, the rise of the Asian driver economies and the intensified global competition, the jobless growth in manufacturing as a result of increasing mechanization, and the threats of global warming and climate change. As a result, apart from broad strategies such as investing in infrastructure, the development of the manufacturing sector will need to be thought through carefully in the context of country-specific conditions. For example, countries that have abundant agricultural resources and that have access to ports are probably well placed to strategically invest in agro-based manufacturing. This would, however, require as much an emphasis on agriculture as on the pre-requisites for manufacturing.

Nonetheless, a new industrial strategy is fundamental to structural transformation and inclusive development in Africa. Economic advancement

does not occur in a vacuum, despite the dictates of market reform. As is evident from the analysis of past policies and the experiences of the newly industrialized economies in Asia, market forces alone cannot sustain increases in a country's income and development. Countries that have industrialized during the past five decades have required sustained, state-facilitated efforts to address binding constraints to industrialization. African countries must move in this direction as they design new industrial policies.

As African countries strive toward a new industrial strategy for structural transformation of their economies, there are some generalities that need to be considered, while at the same time avoiding a uniform strategy. The Commission on Growth and Development report (2008) identifies five factors in all highly successful countries over the past five decades. These are (1) openness to the global economy, (2) macroeconomic stability, (3) high savings and investment rates, (4) market allocation of resources, and (5) strong leadership and good governance. As illustrated in the review of past industrialization policies, these fall short of being sufficient conditions for industrial growth and development, which is where policy interventions

are justified to establish the macroeconomic foundations for growth and to boost infrastructure, which has so far acted as a drag on industrialization, through the orderly implementation of the Programme for Infrastructure Development in Africa (PIDA), which was adopted by the African Union in July 2012 as the integrated strategic blueprint for continental infrastructure transformation during 2012–2040.

The prominence of the informal sector in Africa's industrial landscape deserves urgent attention. This prominence stems from the opportunities it offers to the most vulnerable populations, such as the poorest, women, and youth. Even though the informal sector is an opportunity for generating reasonable incomes for many people, most informal workers are without secure income, employment benefits, and social protection.

There is a need to put in place policies and strategies that will support the formalization of the sector. Effective regulatory framework, good governance, better government services, improved business environment, and better access to financing, technology, and infrastructure are essential in this process.

CHAPTER 8

Infrastructure Challenges and Potential for Africa South of the Sahara

Maximo Torero



Introduction

Poverty and uneven income distribution plague many poor countries, and African countries are no exception. Africa presents an extreme case, however, because the challenges it faces are many and varied. Despite the fact that a majority of the continent's land is poorly suited for the cultivation of food crops, a vast segment of Africa's population survives on subsistence agricultural activities. In addition, the majority of Africans are confined to isolated rural areas. Ninety percent of Africa's land and 80 percent of its population area are located more than 100 km from the coast or from a navigable river (Wood 2002). Transportation costs are so high that they equal a tax of up to 80 percent on goods, as is seen in Uganda's export of clothing to world markets (Milner, Morrissey, and Rudaheranwa 2000).

There is a growing consensus that providing adequate infrastructure is crucial to alleviating poverty and providing more equitable opportunities for all Africans. Several African countries, as well as developing countries in other regions, have undertaken important reforms to promote private investment in infrastructure. The privatization of formerly state-owned telecommunications, water, and electric companies, and the concession of airports, highways, and ports have had an important impact on the quality of Africa's transportation infrastructure. This privatization has also released state resources for more immediate social needs. Through the introduction of market mechanisms and incentives, private investment has been able to reach users in a faster and more efficient way than did the previous state operations. However, a large gap in services remains, especially in rural areas where high costs, a lack of information, and greater risk for infrastructure installation discourage private incentives.

This document presents a snapshot evaluation of the existing literature on the impacts of access to infrastructure, the current infrastructural situation

in Africa, and the access gap in four major infrastructural sectors: rural telecommunications, electrification, water, and rural roads. We have found a clear need to think about infrastructure and institutions in tandem in order to improve Africa's infrastructure. Countries with sound regulatory institutions and legal frameworks have the ability to adopt solutions that would be out of reach for countries with weak institutions. However, alternative institutional designs could adequately reduce the access gap while simultaneously developing a stronger legal, institutional, and regulatory framework.

In addition to a country's institutional framework, we also find that successful practices to improve infrastructure usually rely on market mechanisms and the forging of public-private partnerships. Unilateral public or private initiatives have a lower probability of success.

General Importance of Infrastructure

The aggregate-level links between poverty and rural capital-intensive infrastructure have been studied by various authors, the most important of whom are Lipton and Ravallion (1995), Jimenez (1995), and van de Walle (1996). More broadly, the literature discusses many different dimensions of the impact of infrastructure, including the role of rural roads, telephones, or access to electricity on poverty alleviation (Howe and Richards 1984; Binswanger, Khandker, and Rosenzweig 1993; Jacoby 1998; and Lebo and Schelling 2001, among others). More recently, Renkow, Hallstrom, and Karanja (2004) estimated the fixed transaction costs (those not dependent on commercialized volume) that impede access to product markets by subsistence farmers in Kenya. The authors estimated that high transaction costs are equivalent to a value-added tax of approximately 15 percent, illustrating opportunities to raise producer welfare with effective infrastructure investments. Similarly, Smith et

al. (2001) showed that in Uganda, the rehabilitation of roads increases labor opportunities in the service sector.

Based on an infrastructure index that includes road, rail, and telecommunications density, Limão and Venables (1999) found that infrastructure is a significant and quantitatively important determinant of bilateral trade flows. Improving destination infrastructure by one standard deviation reduces transport costs by an amount equivalent to a reduction of 6,500 km of sea travel or 1,000 km of overland travel. According to their findings, most of Africa's poor trade performance can be attributed to poor infrastructure.

To further analyze the effects of public infrastructure on rural development and rural poverty, it is necessary to distinguish between direct and indirect effects. Direct effects occur when an increase in public infrastructure is accompanied by an increase in production, shifting the production frontier and marginal cost curve, and increasing the rate of return for private investment in rural activities. Indirect effects take place as the access to public infrastructure permits a reduction in the transaction costs that small producers face when they integrate into supply and factor markets.

These lower transaction costs significantly change the structure of relative prices for the producer, stimulating changes in methods of cultivation and breeding, and possibly reallocating labor from the agricultural to the nonagricultural sector. Lanjouw, Quizon, and Sparrow (2001) found that there was a significant increase in nonagricultural activities as a consequence of better roads in Tanzania. This diversification could have arisen out of the necessity to hedge against unanticipated risks in a context where credit and insurance markets malfunction or are nonexistent

(Zimmerman and Carter 2003; Ellis, Kutengule, and Nyasulu 2003).

Alternately, it could be because people lack access to more profitable labor markets because of insufficient public or private assets (Reardon, Berdegue, and Escobar 2001). In either case, access to public infrastructure could play a direct or indirect role in increasing the income-generating opportunities for the poorest rural populations.

In summary, most studies recognize that infrastructure investment has a strong impact on rural incomes, especially for smallholders. However, this literature has not completely assessed the benefits and costs of alternative infrastructure investment options or the causality of relations that generate higher rural incomes due to better infrastructure services.⁵³ This lack of knowledge regarding causal relationships between investment in infrastructural services and the increase in income-generating opportunities and welfare benefits to rural populations limits the development of specific policy recommendations, resulting in policies that are directed toward a general increase in public infrastructure investment but lack information about appropriate intervention strategies for specific contexts.

What We Know about Roads

Early literature on roads attempted to establish a relationship between the stock of public infrastructure and productivity. In rural India, Antle (1984) found that roads, telecommunications infrastructure, and human capital have a positive impact on agricultural productivity. However, the study fails to account for possible reverse causality between output and capital. Also, common trends in infrastructure and output may reflect a spurious

⁵³ The studies carried out by Fan and Hazell (1999); Zhang and Fan (2000); Fan, Hazell, and Haque (2000); Fan, Hazell, and Thorat (2000); and Fan, Zhang, and Zhang (2002) in India and China are among the few that have looked into the relationships among investment in infrastructure, rural growth, poverty alleviation, and the role of a complementarity of investments

correlation that is related to the underlying time trend. Binswanger, Khandker, and Rosenzweig (1993) corrected for reverse causality by using a fixed-effects model with time-trend variables on a panel of 85 districts in 13 states in India. They found that areas with favorable agroclimatic conditions attract roads and financial institutions, ultimately resulting in higher investment and agricultural productivity; the authors were among the first to model the endogenous processes through which roads may lead to higher output. Fan and Zhang (2004) applied the generalized method of moments (GMM) in India to account for reverse causality and found that road density and irrigation have significant effects on agricultural total factor productivity.

More recent work has evaluated the paving of existing roads or the construction of new roads. The majority of impact evaluations on road paving or rural road construction have found positive effects across a wide array of measures, including property values (Gonzalez-Navarro and Quintana-Domeque Forthcoming; Jacoby 2000), transport costs (Jacoby and Minten 2009), agricultural productivity (Dong 2000), crop prices (Khandker, Bakht, and Koolwal 2009; Casaburi, Glennerster, and Suri 2013), income and nonfarm employment (Rand 2011; Jacoby and Minten 2009; Gachassin, Najman and Raballand 2010), consumption (Jalan and Ravallion 2002 Gibson and Rozelle 2003), specialization (Qin and Zhang 2012), and access to health and education services (Valdivia 2009).

The distribution of the benefits of road improvement has tended to favor men, mainly because men's and women's gender-defined roles and responsibilities lead to different patterns of transport access, needs, and use (World Bank 2012). Women are less likely to own motorized transportation and more likely to walk (Peters 2001). In addition, fewer women work in transport-related jobs (Duchene 2011). Despite the growing recognition

that women have different transport needs, however, few studies have taken gender into account when assessing the impact of roads. Khandker, Bakht, and Koolwal (2009) examined the effect of paving feeder roads and upgrading market infrastructure in rural Bangladesh on men's and women's agricultural and nonagricultural labor supply, and found that the number of days worked during the previous month increased for men and decreased for women. Valdivia (2009) analyzed a road maintenance program in Peru and found that women reduced their participation as unpaid workers on the family farm in favor of outside agricultural work; on the other hand, men appeared to have better access to nonagricultural wage work.

There is mixed evidence regarding whether wealthier households are better positioned to benefit from road improvement. Lokshin and Yemtsov (2005) evaluated rehabilitation of schools, roads and bridges, and water systems in Georgia. Dividing their sample into poor and nonpoor households, they found that off-farm employment improved solely for nonpoor households; however, their results were not statistically significant. Khandker, Bakht, and Koolwal (2009) estimated the effects of feeder roads on different parts of the income distribution with a quantile regression, finding that the program increased household per capita expenditure and that these effects were larger in poor communities. However, Khandker and Koolwal (2011) estimated the long-term effects of road construction and found that its pro-poor benefits diminish over time. These studies underscore the point that impacts may take a while to emerge and may be different over time, as do the studies of Mu and van de Walle (2011) and van de Walle (2009).

Van de Walle (2009) also highlighted the fact that people do not derive utility from roads themselves but rather through the opportunities for extra consumption that the roads facilitate. Thus, the impact of roads is dependent on other investments, infrastructure, and community characteristics.

Gachassin, Najman and Raballand (2010, p. 28) strongly advocated against “investing uniformly for roads in Africa” and emphasized that roads are effective only insofar as they take into account the needs of road users.

Raballand, Macchi, and Petracco (2010), drawing on case studies in Burkina Faso, Cameroon, and Uganda, challenged the assumption that the presence of high-quality roads will increase mobility and allow farmers to truck their produce to market on the grounds that farmers may not have adequate surplus or there may be collusion in the trucking industry.

The literature acknowledges that roads may not be sufficient to ensure poverty reduction and that their impact may depend on access to other assets. Yamauchi and others (2011) examined survey data on village road quality in rural Indonesia and found that in areas that received road improvements, postprimary education significantly increased the number of days worked in nonagricultural labor, as well as nonagricultural income growth. Escobal and Torero (2005) estimated the interaction effects between traditional infrastructure such as roads, electricity, and sewage with “human capital–generating” public services such as education, access to healthcare, and access to communication infrastructure. Using a simulation based on survey data from Peru, they found that investment in a combination of roads, telecommunication infrastructure, and schools leads to a higher expected increase in expenditures among the poor than the sum of the individual effects of these investments alone.

Road placement is not random, and factors linked to the decision to build a road are likely correlated with outcome variables. For example, if an area is selected to receive a road because of its high agricultural potential, then estimates of the impacts of the road will be upwardly biased. Furthermore, there may be unobserved individual characteristics, such as a household’s decision to locate near a road, that are likely correlated with program

placement. Gonzalez-Navarro and Quintana-Domeque (Forthcoming) ran an experiment to evaluate the effects of asphaltting roads by randomly selecting a first time asphaltting of residential nonarterial streets in a peri-urban setting in Mexico. They found that two years postintervention, households that had received the treatment increased their use of collateralized credit, leading to higher consumption of consumer durables and automobiles. However, the authors were unable to determine whether this increase was the result of an increase in the demand for or the supply of credit. They also found that road paving did not significantly increase consumption of nondurables, labor supplied, income, school attendance, or self-reported health.

Other evaluations of road construction employ quasi-experimental techniques to deal with endogeneity. Rand (2011) implemented a matched double-difference approach that controlled for factors influencing the placement of roads and subsequent employment growth rates to evaluate the effects of construction of tertiary roads in Nicaragua. He estimated that hours worked per week increased by between 9.5 and 12.3 in communities that received roads, relative to control communities. Escobal and Ponce (2002) used propensity score matching at the town level to evaluate a rehabilitation program in Peru, and found that the program increased income through access to wage opportunities. However, consumption did not increase because the road improvement was “perceived as transitory” (Escobal and Ponce 2002, p.5).

Casaburi, Glennerster and Suri (2013) evaluated the paving of feeder roads in Sierra Leone using a regression discontinuity that created cutoff points with the exact methodology and data that the managing consultant used to prioritize which roads would be built first. The presence of a road reduced both transport costs and market prices of rice and cassava. The authors then tested alternative theoretical models to explain their results,

finding that results were most consistent with the search-cost framework developed by Mortensen (2003). In this framework, higher transportation costs stemming from being far away from a city lower the net price available to traders, which leads to fewer traders entering the market and increases traders' monopsony power. Road construction decreases these high costs, with larger effects in the most remote markets.

Instrumental variables have also been used to evaluate the effect of roads in the absence of an intervention or new construction. Dercon et al. (2008) used a generalized method of moments (GMM) instrumental variable estimator with household fixed effects to account for endogeneity in a growth model. Their sample consisted of survey data from 15 Ethiopian villages whose residents had access to roads of different quality. Using as instruments log of fertile landholdings, log number of adult equivalents, and log number of livestock holdings, they found that access to all-weather roads reduces poverty by 7.6 percent and increases consumption growth by 16.3 percent.

Evaluations of highway construction use instrumental variables for road placement based on the timing of construction or project-specific features. Gibson and Rozelle (2003) used the year that a district receives a national highway as an instrument to explain variation in travel time to roads in Papua New Guinea. They found that cutting the time to the nearest road to three hours would reduce the percentage of people living below the poverty line by 5.36 percent. Faber (2014) used least-cost path-spanning networks as an instrument to evaluate highways intended to connect provincial capitals with cities of more than 500,000 people in China. He found that the project reduced interregional trade costs, which led to a decrease in gross domestic product (GDP) growth in nontargeted rural counties. In the study, road infrastructure led to a reduction in industrial growth in nonconnected areas relative to connected ones.

What We Know about Rural Electrification

According to the International Energy Agency's World Energy Outlook (OECD/IEA 2013), more than 1.2 million people worldwide did not have access to electricity in 2011, almost all in developing countries (1,257,000 out of 1,258,000). The electrification rate in Africa south of the Sahara (SSA) was no higher than 32 percent, and these figures were even more alarming in rural areas—only 65.1 percent of developing-country rural areas had access to electricity in 2011.

In theory, access to electricity can improve socioeconomic conditions in developing countries by improving health, education, income, and the environment (Kanagawa and Nakata 2008). Chaurey, Ranganathan, and Mohanty (2004) argued that a strong correlation exists between rural poverty and access to electricity because electricity is a prerequisite for productive activities. In addition to providing access to more efficient means of production, access to an electrical grid and better electric services could also result in household time savings, allowing households to work more hours by increasing their access to markets (Bernard and Torero 2011). Impact evaluations of rural electrification programs can help identify the causal link between the intervention's activities and these socioeconomic outcomes. Several impact estimations on various economic development measures have been conducted, reaching various conclusions.

Many articles focus on electrification in South Africa. The keen interest in this particular country can be explained by the quite recent rollout of grid infrastructure in South Africa and the provision of electricity to households, both of which provide a very good opportunity for impact evaluation. Davis (1998) focused on changes in rural South African households' energy consumption patterns following electrification. The author used data from a household survey and described the evolution of energy expenditures and

fuel use, concluding that an energy transition did appear in rural households but keeping the role of access to electricity in perspective. According to Davis, only weak evidence suggests that electrification accelerated the energy transition. Dinkelman (2011) used panel data, the instrumental variables strategy, and a fixed effects approach to find that electrification has a positive effect on female employment. She also found that the new infrastructure seems to increase hours of work for both men and women and that while women's wages tend to decrease if they are released from home production, men appear to earn more money under the same circumstances.

The literature also looks at other countries. Khandker et al. (2009) analyzed the welfare impacts of rural electrification in Vietnam, basing their analysis on panel surveys from 2002 and 2005. Their econometric framework included difference-in-difference (DD), with fixed-effects regression, and propensity score matching with double difference. The authors found significant grid electrification to have positive impacts on households' cash income, expenditures, and educational outcomes. They also stressed that a saturation point is reached after prolonged exposure to electricity.

Focusing on India, Bhattacharyya claimed that "rural electrification alone is unlikely to resolve the energy access problem because of low penetration of electricity in the energy mix of the poor" (2006, p.3,387). More recently, however, van de Walle et al. (2013) found that rural electrification has positive effects on consumption and earnings, as well as on schooling for girls. Bernard (2012) explored the impacts of rural electrification projects in SSA and gave a very interesting review of trends in electrification programs over the past 30 years in the region. While the author argued in favor of the importance of rural electrification, he also pointed out that its impacts on development components such as health or education are "largely undocumented" (Bernard 2012, p.33).

What We Know about Information and Telecommunication Technologies

An increasing body of evidence highlights the potential for information and communication technologies (ICTs) to improve the lives of the poor. Increased access to and adoption of new technologies can address the challenges of food insecurity on multiple fronts, including increasing households' access to nonfarm income and enabling households to better gauge the safety, quality, and nutritional value of their food

ICTs can make poor populations more resilient in several ways. First, access to technology can increase the amount, timeliness, and quality of information available to the poor. Preliminary research suggests that this in turn can translate into better job opportunities (as the poor establish better contacts) and higher crop yields (as they get access to timelier and better-quality information on products and inputs, environmental conditions, and market conditions (Klonner and Nolen 2010). Second, ICTs may promote learning, which itself can enhance technology adoption among farmers (Bandiera and Rasul 2006). Last, although no evidence is available as yet, it is conceivable that improved access to health and nutritional information through ICTs can help reduce the prevalence of hunger among the poor.

There are many reasons to believe that ICTs may have a large impact on agricultural markets. ICTs can allow different market agents to communicate with each other more efficiently, thus enhancing information flows. This can be critically important for rural areas in developing countries, where inadequate infrastructure tends to make markets less integrated than elsewhere. Mobile phones are particularly good at spreading information. As of October 2013, 98 mobile phone projects were being implemented in the agricultural sector of developing countries, as compiled by the 2013 Global System for Mobile Communications Mobile and Development

Intelligence project.⁵⁴ Delivery is done mainly through short message service (SMS, or text message), although voice messages, interactive voice response systems, and mobile applications (apps) are also used. Most projects deliver information regarding market prices (48 percent) and agricultural extension (39 percent), combined with weather advisory information in a number of important cases.

The most important thing to be gained from increased information in agricultural markets is market efficiency.⁵⁵ With increased access to mobile phones, farmers can better plan how much to plant each season and how much and what type of investments could be profitable based on demand and supply fundamentals.⁵⁶ They can also gather information from extended networks and cooperatives regarding market conditions and quality standards in higher-end markets.

There is also anecdotal evidence suggesting that ICTs might affect transportation costs for both inputs and crops. A farmer in India stated, “I was in process to transport my produce of [approximately 1,000 boxes in two trucks] to Delhi when I got an SMS through RML [Reuters Market Light, a mobile phone–based information service] that the freight rate from Kotgarh to Delhi is Rs [rupees] 41.07 per box. I showed this message to the truck operator, who till then was citing a rate of Rs 44 per box. Following this I was able to settle the transporting deal at Rs 41.07, finally saving around 3,000 rupees” (Murali 2011).

ICTs can also be used to reduce price variability. In a context of limited information—and thus limited arbitrage—prices tend to vary based on the current local supply. However, as information flows improve, more opportunities for arbitrage emerge, effectively limiting the influence of local fluctuations and more closely relating market prices to less-volatile aggregate supply. Finally, improved information can teach households about more profitable crops or previously unknown agricultural techniques, thus potentially influencing production patterns in the long term.

Though far from conclusive or uniform, some studies have provided a range of estimates for some of the hypothesized effects of ICT information flows on smallholders’ sales prices and profits. Investigating the impact of price dissemination through radio, for example, Svensson and Yanagizawa (2009) found large increases (around 15 percent) in farmgate prices for maize in Uganda. Preliminary research in Peru and the Philippines suggests similarly large effects.⁵⁷ A more thorough list of such studies is presented in Table 8.1.

Finally, ICTs can also play a role in reducing the three main constraints faced by traditional extension services in developing countries (Cole and Fernando 2012). First, poor infrastructure makes it difficult and costly to visit remote areas. Second, traditional extension programs usually provide only one-time information to farmers; the lack of follow-up information and feedback can restrict the information’s long-term benefits. Finally, traditional

⁵⁴ See www.mobiledevelopmentintelligence.com.

⁵⁵ For a wider list of gains see Jensen (2010).

⁵⁶ See Abraham (2007), Jensen (2007), Aker (2008a, 2008b, 2010), and Muto and Yamano (2009).

⁵⁷ For Peru, see Chong, Galdo, and Torero (2005) and Beuermann, McKelvey, and Vakis (2012). For the Philippines, see Labonne and Chase (2009).

TABLE 8.1—STUDIES ON THE IMPACTS OF ICTS

PRODUCT	TECHNOLOGY	LOCATION	IMPACT	STUDY	
1	Various crops	Public pay phones	Peru	16% increase in prices	Beuermann 2011
2	Various enterprises	Public pay phones	Peru	13% increase in farm income	Chong, Galdo, and Torero 2005
3	Various crops	Cell phones	Peru	11% increase in household consumption	Beuermann, McKelvey, and Vakis 2012
4	Maize, potatoes, olluco, barley	Cell phones	Peru	No positive impact	Nakasone 2013
5	Green peas, lima beans	Cell phones	Peru	11–13% increase in average prices	Nakasone 2013
6	Various products	SMS	Colombia	No positive impact	Camacho and Conover 2011
7	Various crops	SMS	Colombia	No positive impact	Camacho and Conover 2011
8	Maize	Radio	Uganda	15% increase in prices	Svensson and Yanagizawa 2009
9	Bananas	Mobile phone coverage	Uganda	Somewhat positive impact, depending on distance to district center	Muto and Yamano 2009
10	Maize	Mobile phone coverage	Uganda	Somewhat positive impact, depending on distance to district center	Muto and Yamano 2009
11	Various products	Grameen/MTN village phones	Rwanda	No positive impact	Futch and McIntosh 2009
12	Cowpeas	Cell phones	Niger	No positive impact	Aker and Fafchamps 2010
13	Millet	Cell phones	Niger	No positive impact	Aker and Fafchamps 2010
14	Groundnuts	SMS	Ghana	9.7% increase in prices	Courtois and Subervie 2013
15	Maize	SMS	Ghana	12.7% increase in prices	Courtois and Subervie 2013
16	Yams	SMS	Ghana	7% increase in prices	Nyarko et al. 2013
17	Maize, cassava, gari	SMS	Ghana	No positive impact	Nyarko et al. 2013
18	Various crops	Cell phones	Philippines	11–17% increase in per capita consumption	Labonne and Chase 2009
19	Fisheries	Cell phones	Kerala, India	8% increase in fishermen profits	Jensen 2007
20	Soybeans	e-Choupal	Madhya Pradesh, India	1–3% increase in prices (average = 1.6%)	Goyal 2010
21	Potatoes	SMS	West Bengal, India	No positive impact	Mitra et al. 2012
22	Various products	SMS	Maharashtra, India	No positive impact	Fafchamps and Minten 2012
23	Eggs	Cell phones	Bangladesh	Positive impact, not specified	Bayes 2001

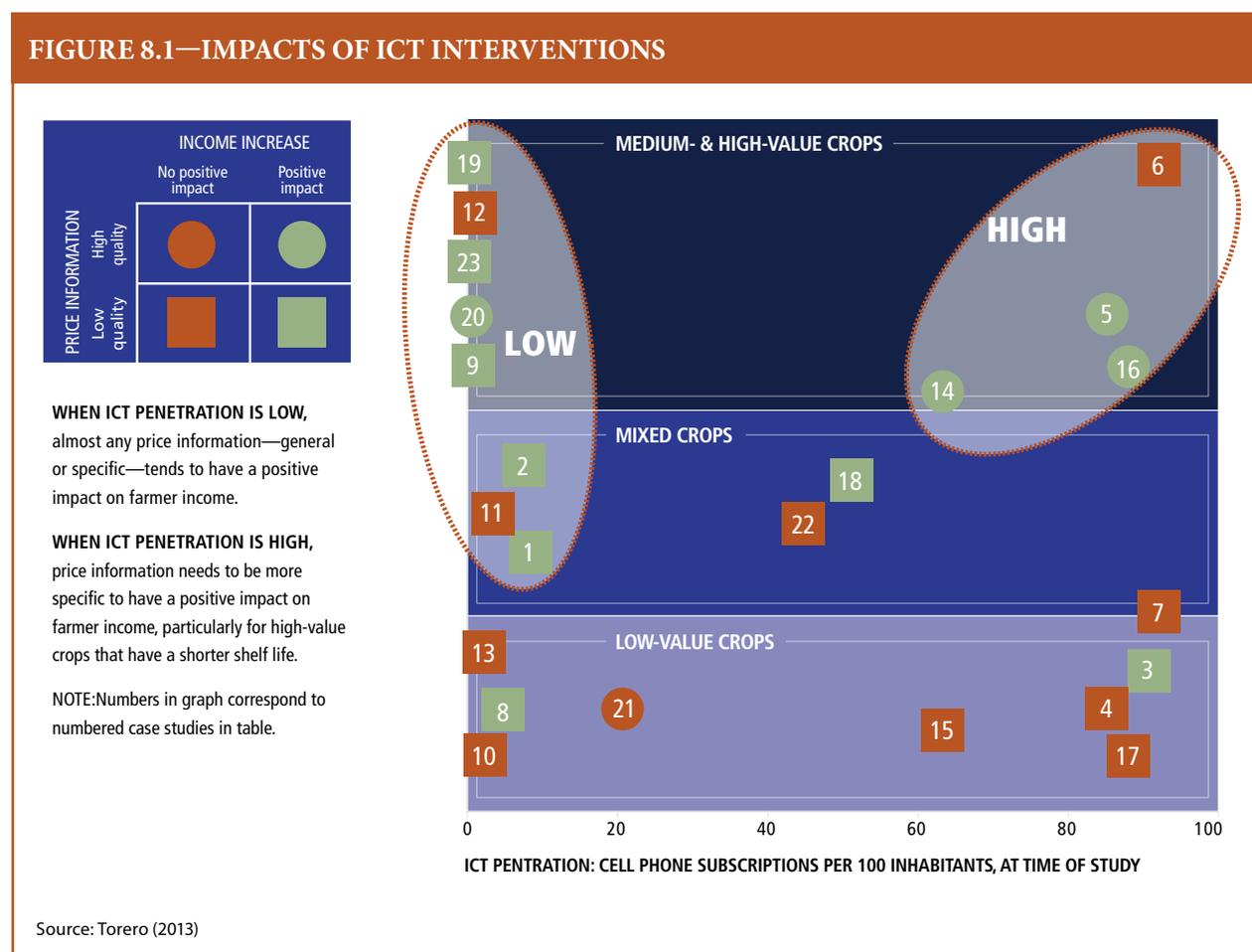
Source: Torero (2013).

extension is plagued by principal-agent and institutional problems, including a lack of accountability among extension agents. ICTs can overcome these problems by reducing the cost of extension visits, enabling more frequent two-way communication between farmers and agents, and improving the accountability of agents. By increasing communication among farmers, extension agents, and research centers, ICTs can facilitate coordination of relevant content among all three groups.

Our analysis of the existing research, illustrated in Figure 8.1, takes into account (1) the level of mobile phone penetration in the country when the interventions in the studies detailed in Table 8.1 were implemented, (2) the specific characteristic of the commodity in terms of its market value, (3) the specificity or quality of the content being provided to farmers (that is, whether price information is general or specific to the commodity and the markets relevant for the farmer), and (4) the statistical significance of the interventions' impacts (light green means significant and orange means not significant). The synthesis presented in Figure 8.1 is not conclusive given the small number of existing studies and the preliminary nature of several of them; however, several patterns suggest hypotheses to be further researched.

First, we find that the lower the mobile phone penetration at the time of implementation, the more statistically significant the intervention's impact on farmers, especially for medium- and high-value commodities. This result can be partially explained by the fact that low penetration can be directly related to a significant difference in knowledge about prices (or information asymmetry) among farmers; as ICT penetration increases, all farmers might be better able to access the same price information, which has the potential to

FIGURE 8.1—IMPACTS OF ICT INTERVENTIONS



significantly impact farmers' marketing decisions (such as whether to invest in medium- and high-value crops). Thus, an intervention that increases ICT penetration has the potential to significantly affect agricultural markets.

Second, as penetration, and therefore access to information, increases, the specific content of the information (that is, the usefulness of the information to the farmer) comes to matter significantly. We find that the impact of information seems significant only when that information provides specific price information regarding high-value commodities. Fafchamps and Minten (2012) assessed the impact of information in regions of India where mobile phone penetration was higher than 40 percent but where only generic information was provided; they found no significant results stemming from that information. On the other hand, other studies have shown significant results when the information provided was customized to the specific high-value commodities and varieties produced by the farmers studied.⁵⁸ Nakasone (2013) also suggested that increased information, no matter how specific, for low-value and less perishable commodities is not significant.

What We Know about Water and Sanitation

The role of clean water and adequate sanitation in development has long been recognized; from the effects on child mortality to school attendance and work productivity gains, water and sanitation can improve the well-being of people throughout their life span (WHO and UNICEF 2005). Lack of access to water and sanitation not only exposes people to infectious waterborne diseases that decrease the probability of survival at both young and old ages, but it also imposes a burden on their economic life by increasing time spent

out of productive activities due to illness, time spent fetching water, and water storage and treatment costs.

The health impacts of water and sanitation programs have been studied frequently (see Fewtrell et al. 2005; Pattanayak et al. 2008, 2010; Newman et al. 2002; Galiani, Gertler, and Schargrodsky 2005; Galiani, Gonzalez-Rozada, and Schargrodsky 2009; Devoto et al. 2012; Jalan and Ravallion 2003; and Gamper-Rabindran, Khan, and Timmins 2010). However, very few studies have measured other important outcomes, such as changes in households' costs of collecting, storing, and treating water or income losses due to waterborne and water-washed illnesses (Pattanayak et al. 2008). Furthermore, there are few rigorous impact evaluations that have measured water and sanitation interventions' education, gender, and poverty reduction impacts. Bosch et al. (2000) categorized water and sanitation impacts into four groups: health improvement, education, gender and social inclusion, and income and consumption.

On the health side, impact evaluations have focused on child mortality, given that diarrheal disease is the second leading cause of death in children under five years old and a leading cause of malnutrition (WHO 2013). Newman et al. (2002) evaluated small water and sanitation projects in Bolivia and found that community-level training was needed to impact water quality. They also found effects on infant mortality, bringing forward the importance of coupling "hardware" interventions with "software" interventions to achieve development goals. Galiani, Gertler, and Schargrodsky (2005) found that child mortality in Argentina fell by 8 percent due to increased access to water (through privatization), with the poorest benefiting the most. Kremer et al. (2011) found positive effects on child health from a randomized experiment

⁵⁸ See Nakasone (2013), Courtois and Subervie (2013), and Nyarko et al. (2013).

in Kenya that protected water sources, while Devoto et al. (2012) found effects on child health from an intervention that provided tap connections to an urban sample in Morocco. These two studies highlight the importance of distinguishing between increases in water quantity and quality. Kremer et al. (2011) evaluated the impact of an increase in the water quality available to the treatment group by protecting the water sources, while Devoto et al. (2012) evaluated the impact of increasing the quantity of water available to households in an urban area; no changes in quality are expected in this latter setting since these households were already obtaining water from this network before the intervention.

Other studies have explored the link between water and child health. Jalan and Ravallion (2003) found that piped water lowered the prevalence and duration of diarrhea among children under five in rural India. On the other side of the spectrum, Klasen et al. (2011) evaluated the impact of increased access to piped water supply in Yemen and found that frequent water rationing worsens health outcomes, likely due to pollution in the network. Fan and Mahal (2011) found nonrobust positive effects of water and sanitation on dysentery, and significant reductions in diarrhea among children under five due to hygienic practices (hand washing).

One important issue to keep in mind is the complementarities of water and sanitation projects. For example, Esrey (1996) found that improved water quality can improve child health if sanitation is also provided. Some rigorous evaluations, like those of Pattanayak et al. (2008, 2009), found that a community demand-driven water and sanitation intervention in India had positive effects on the level of access to piped water and sanitary services, but no discernible health or education impacts.

The evidence on the effects of water and sanitation on income and consumption is limited,⁵⁹ as is evidence of the effects of water and sanitation on gender and social inclusion. Impacts on gender and social inclusion refer to the extent that minorities, the poor, or other vulnerable populations benefit from the water and sanitation interventions. The effects might be larger for some of these populations because of nonlinear treatment effects; for example, if women disproportionately participate in fetching water, they would see larger benefits from a project that provides tap water (Koolwal and van de Walle 2013). On the other hand, if the cost of connecting to a tap is high, poorer households might not be able to afford the connection and thus will not benefit from the project even if they were the targeted population (Zwane and Kremer 2007).

Few studies quantify the impact of water access on productivity in either agriculture or the labor market, and to date, no discernible effects have been found. For example, Devoto et al. (2012) found no changes in the time allocated to productive activities, and Koolwal and van de Walle (2013) did not find that access to water leads to more off-farm work for women.

State of Infrastructure in Africa South of the Sahara

As mentioned in Torero and Chowdhury (2005), SSA has remained behind the Western Hemisphere for several centuries, even more so than Latin America in the last decades. Figures 8.2a, b, and c show the evolution of this pattern for three hard infrastructures. Increases in population moved each

⁵⁹ Some studies have found limited effects on these outcomes (Chase 2002; Lokshin and Yemtsov 2005; Kremer et al. 2011; Pattanayak et al. 2008, 2010; Devoto et al. 2012)..

group to the left by reducing its land/labor ratio, and each group of countries also moved upward because of the expansion of access to each infrastructure. However, it is clear that the movements for SSA were significantly smaller than those of other groups of countries, especially the Latin American countries, the major exception being the case of cellular phones, where there is a significant increase in the penetration of cellular phones in the region.

This significant lag in access to hard infrastructure has normally been attributed to geography and to the initial condition of infrastructure in SSA. In reality, disease, internal distances, and sparse population have been much larger obstacles.

As mentioned in Torero and Chowdhury (2005), unlike Asia and Latin America, SSA inherited a highly dispersed and unevenly distributed infrastructure from its colonial past. There was little, if any, improvement of infrastructure during the colonial era, and according to Platteau, “in some important respects, it can even be said that colonial policy reinforced the handicaps of [the region]” (1996, 200). The limited infrastructure that was built during that era was driven by the objective of connecting natural resources to export markets. For example, Platteau noted that “two-thirds of the African railways built in the colonial period connected mines to a coastal harbor” (1996, 200). The rest of the continent was virtually ignored, and according to Boserup, “only South Africa with mass immigration of Europeans had

FIGURE 8.2a—EVOLUTION OF INFRASTRUCTURE (PAVED ROADS)

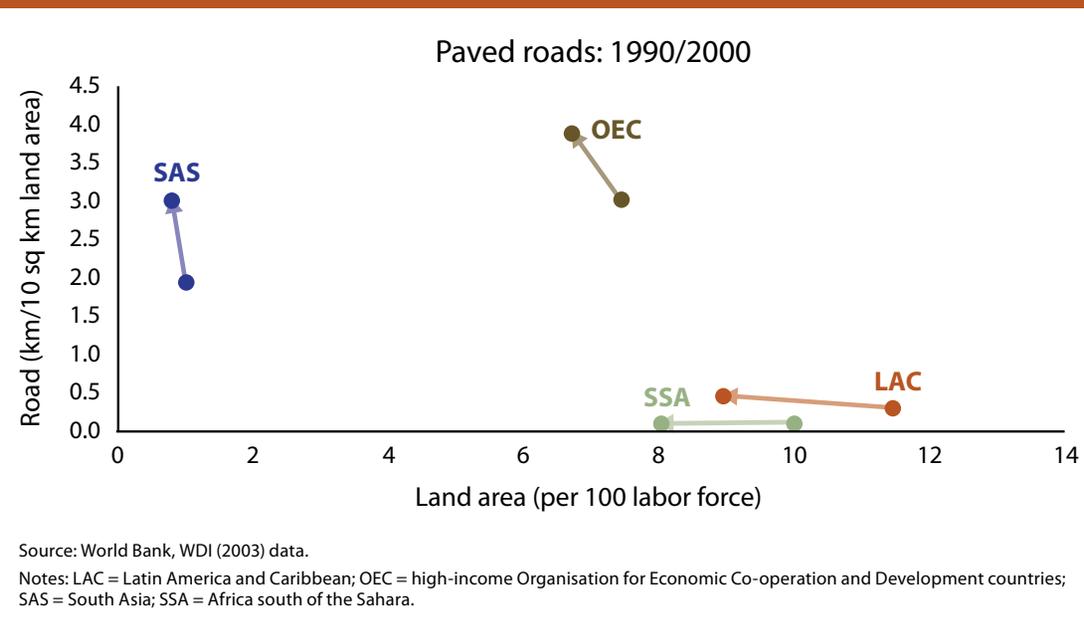


FIGURE 8.2b—EVOLUTION OF INFRASTRUCTURE (PER CAPITA ENERGY CONSUMPTION)

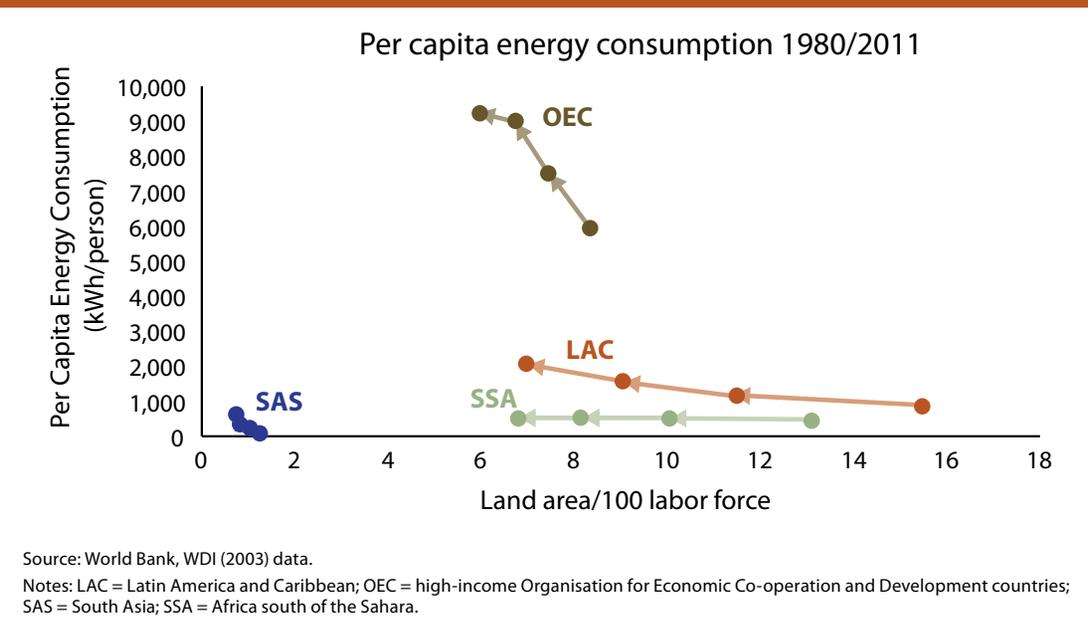
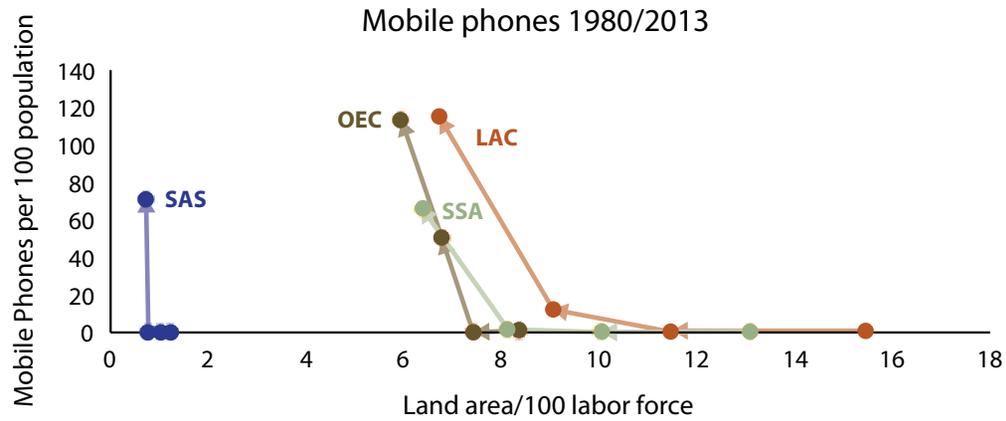


FIGURE 8.2c—EVOLUTION OF INFRASTRUCTURE (MOBILE PHONES)



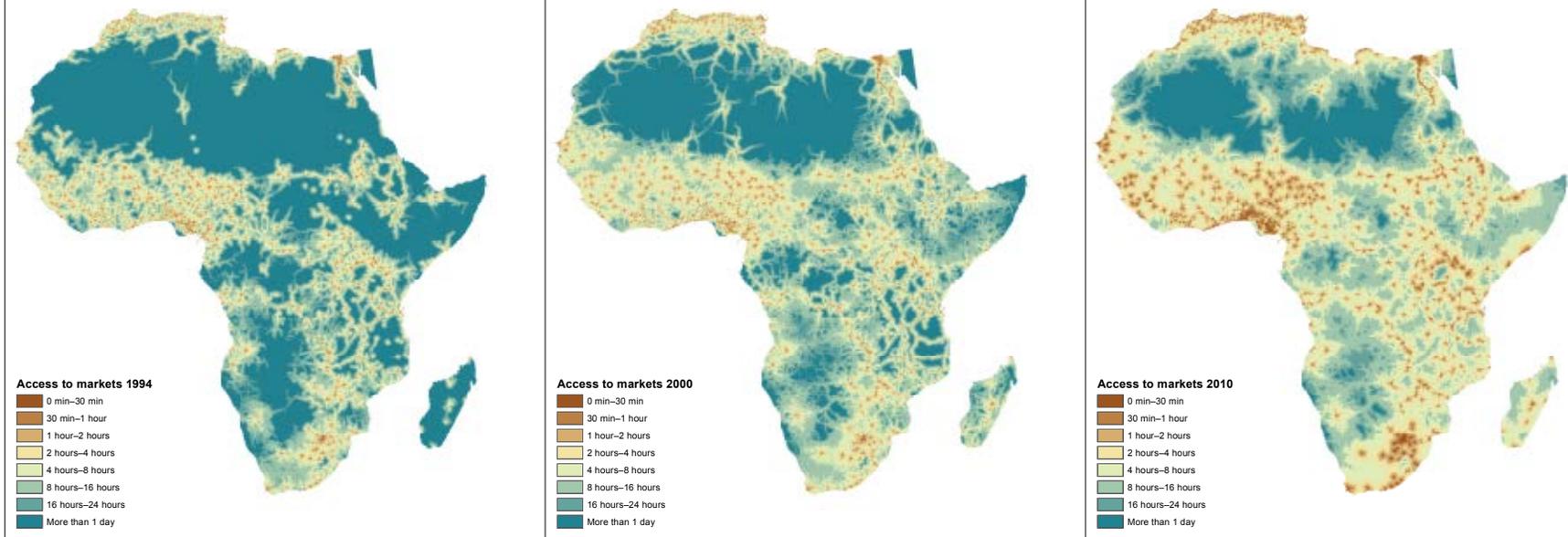
Source: World Bank, WDI (2003) data.

Notes: LAC= Latin America and Caribbean; OEC= high-income Organisation for Economic Co-operation and Development countries; SAS = South Asia; SSA = Africa south of the Sahara.

more than six meters of railways per square kilometer in 1970, and six countries had no railways at all” (1981, 148). This could be a clear consequence of lack of demand because of sparsely populated areas and a resulting low capacity to maintain infrastructure and to obtain expected returns. In addition, political factors were an important constraint in SSA, resulting in higher noncommercial risks and less private investment (Wood 2002).

Now when we look into the evolution over time of access to infrastructure, we find interesting patterns. First, Figure 8.3, analyzing the improvement in access to roads, shows

FIGURE 8.3—ACCESS TO MARKETS

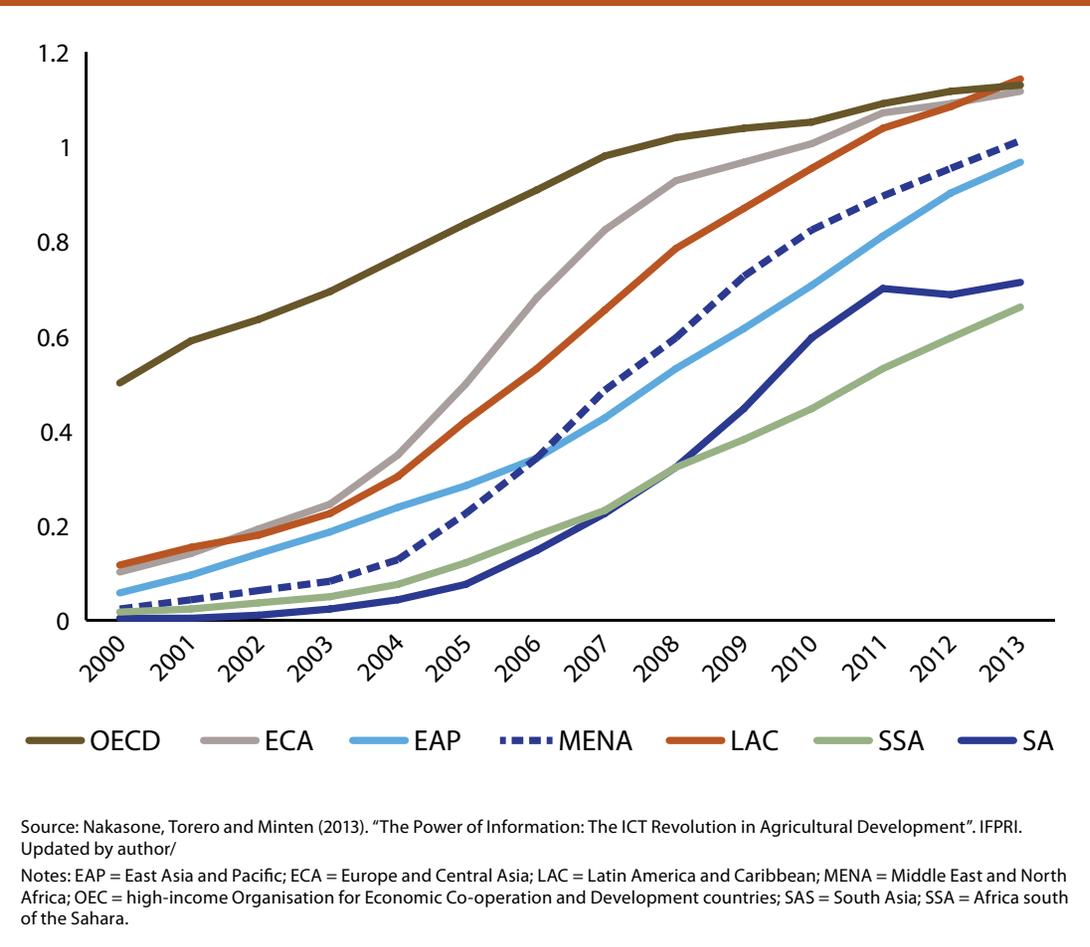


Source: Author’s estimations using raster analysis and updated road maps.

how the time to access the different markets has improved over time, although the improvement is still small. In SSA the density of paved roads is 21 km/km², while in other low-income countries it is around 134 km/km² (Yepes et al. 2008). Similarly, the total road density is 137 km/km² in SSA, while in other developing countries it is 211 km/km².

In terms of energy consumption and generating capacity, the situation is even more striking (see Figure 8.2b). The comparison with South Asia, a region with similar per capita income, is particularly striking. In 1970, SSA had almost three times as much generating capacity per million people as South Asia had. Three decades later, in 2000, South Asia has almost twice the generating capacity per million people. Africa's largest infrastructure deficit is to be found in the power sector—whether measured in terms of generating capacity, electricity consumption, or security of supply. As Foster (2008) mentioned, the 48 countries in SSA (with a combined population of 800 million) generate roughly the same amount of power as Spain (with a population of 45 million). Power consumption, at 124 kilowatt hours per capita per year and falling, is only a tenth of that found elsewhere in the developing world, barely enough to power one 100-watt light bulb per person for three hours a day. Africa's firms report losing 5 percent of their sales as a result of frequent power outages; this rises to 20 percent for informal-sector firms unable to afford backup generation facilities. This problem is critical because it directly affects the productivity and competitiveness of the continent. As explained earlier, access to electricity has significant impacts

FIGURE 8.4—RATIO OF MOBILE PHONE SUBSCRIPTIONS TO POPULATION IN SSA AND THE WORLD



on the livelihoods and welfare of households but also plays a significant role in the capacity of a country to transform toward an economy with higher value-added.

With regard to ICTs, especially cellular phones, Figure 8.2c shows that SSA is staying closer to development elsewhere in the world. Figure 8.4 also shows how the penetration of mobile phone subscriptions is improving,

although still there is a lag with respect to other regions like Latin America. As Table 8.2 shows, ownership of mobile phones varies considerably between countries, being generally higher in Latin America and Asia than in Africa. Whereas more than 80 percent of households own a mobile phone in Colombia, less than 40 percent do in Malawi and Mozambique; in Ethiopia, this figure drops to less than 25 percent. In contrast, some African countries have surprisingly good access, such as Senegal (88 percent) and Nigeria (71 percent). There are also wide gaps in mobile phone ownership between rural and urban areas; overall, rural areas have less ownership. This gap is again generally smaller for Latin America and Asia than it is for Africa.

Finally, when we look at broadband subscription as a source of modern telecommunications, SSA again shows an enormous delay with respect to other regions. This lag is of crucial importance because broadband is a technology that could substantially reduce the communication costs in the region (see Figure 8.5).

Finally, as shown in Table 8.3, Africa of the south of the Sahara still has a significant gap in access to water and sanitation, which is of extreme importance for health in the region as previously explained.

Africa's highly variable levels of precipitation and its relative lack of water storage facilities and irrigation mean that its water resources are not adequately utilized (Foster 2008). Only around 6 percent of cultivated area in Africa is equipped for irrigation, with only five countries accounting for over two-thirds of irrigated land (You et al. 2010). You et

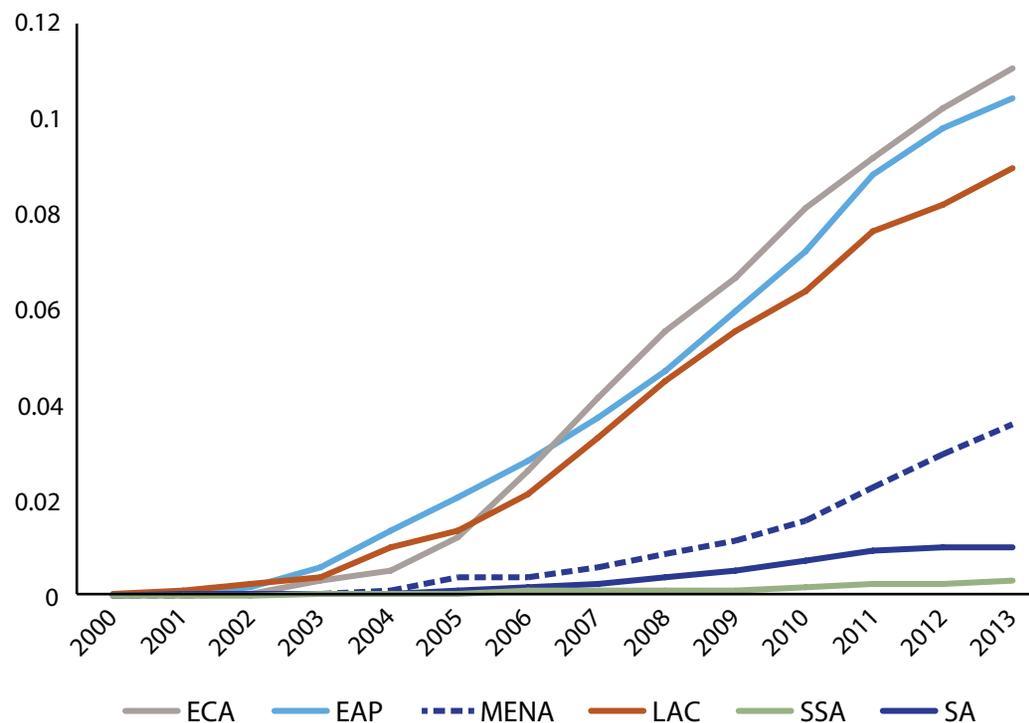
TABLE 8.2—PERCENTAGE OF HOUSEHOLDS THAT OWN A MOBILE PHONE, BY RESIDENCE AREA, AFRICA VERSUS OTHER REGIONS

Country (year of study)	Urban (%)	Rural (%)	Rural-urban gap (%)	All (%)
Africa				
Tanzania (2010) ^d	77.5%	34.2%	43.3%	45.4%
Kenya (2010) ^e	71.9%	55.0%	16.9%	59.8%
South Africa (2008–2009) ^f	87.5%	82.0%	5.5%	85.7%
Liberia (2009) ^g	69.0%	20.7%	48.3%	43.2%
Malawi (2010) ^h	72.7%	32.3%	40.5%	39.0%
Ghana (2010) ⁱ	63.4%	29.6%	33.8%	47.7%
Nigeria (2009) ^j	88.3%	60.3%	28.0%	70.6%
Egypt (2008) ^k	54.1%	27.8%	26.3%	40.5%
Ethiopia (2011) ^l	65.2%	12.8%	52.4%	24.7%
Uganda (2011) ^m	86.8%	53.1%	33.7%	59.4%
Senegal (2011) ⁿ	95.4%	81.7%	13.7%	88.4%
Mozambique (2011) ^o	66.8%	20.0%	46.8%	34.1%
Zimbabwe (2011) ^q	90.1%	48.0%	42.1%	62.2%
Rwanda (2010) ^r	71.8%	35.1%	36.7%	40.3%
Latin America				
Bolivia (2007) ^a	77.6%	18.7%	58.9%	57.0%
Brazil (2009) ^a	83.3%	53.2%	30.1%	78.8%
Colombia (2010) ^a	90.2%	71.7%	18.5%	86.0%
Ecuador (2010) ^a	82.9%	59.7%	23.2%	75.5%
Mexico (2007) ^a	66.6%	45.0%	21.6%	55.2%
Peru (2010) ^a	82.2%	47.1%	35.1%	70.4%
Asia				
India (2011) ^b	76.0%	51.2%	24.8%	59.2%
Bangladesh (2010) ^c	82.7%	56.8%	25.9%	63.7%
Nepal (2011) ^p	91.6%	71.9%	19.7%	74.7%
Cambodia (2010) ^s	90.1%	56.2%	33.9%	61.9%
China (2010) ^t	76.3%	60.7%	15.6%	67.9%

Source: Nakasone, Torero, and Minten (2014).

Notes: a From OSILAC (<http://www.eclac.org/tic/flash/>). Data are based on different household surveys. When multiple years of data were available, we took the most recent survey. b From Census of India (<http://tinyurl.com/kej98a8>). c From Islam & Saha (2011), based on the 2010 Household Income and Expenditure Survey. d Mainland Tanzania only (excludes Zanzibar). From Tanzanian National Bureau of Statistics, based on the 2010 Demographic and Health Survey. e From Kenya National Bureau of Statistics, based on the 2010 National ICT Survey. f Percentage of households that either own or have access to a mobile phone. From Statistics South Africa (2011), based on the 2008–2009 Living Conditions Survey. g From Liberia Malaria Survey Indicator 2009. h From Malawi Demographic and Health Survey 2010. i Percentage of the population 12 years or older possessing mobile phones. From 2010 Population and Housing Census. j From Nigerian Communications Commission, Central Bank of Nigeria, National Bureau of Statistics, and 2009 Collaborative Survey on Socio-Economic Activities in Nigeria. k From 2008 Demographic and Health Survey. l From 2011 Demographic and Health Survey. m From 2011 Demographic and Health Survey. n From 2010–2011 Demographic and Health Survey. o From Inquérito Demográfico e de Saúde 2011. p From 2011 Demographic and Health Survey. q From 2010–2011 Demographic and Health Survey. r From 2010 Demographic and Health Survey. s From 2010 Demographic and Health Survey. t Percentage of households with access to mobile phones according to the 2010 China Family Panel Survey

FIGURE 8.5—RATIO OF BROADBAND SUBSCRIPTIONS TO POPULATION



Source: Nakasone, Torero and Minten (2013). "The Power of Information: The ICT Revolution in Agricultural Development". IFPRI. Updated by author/

Notes: EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and Caribbean; MENA = Middle East and North Africa; OEC = high-income Organisation for Economic Co-operation and Development countries; SAS = South Asia; SSA = Africa south of the Sahara.

TABLE 8.3—ACCESS TO ELECTRICITY, WATER, AND SANITATION

Variable	World			Low-income countries			SSA		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
% population with electricity	71.8%	96.5%	84.6%	12.2%	58.7%	24.9%	15.3%	71.9%	35.4%
% population with access to safe water	81.5%	96.5%	89.3%	54.1%	87.1%	63%	52.6%	85.1%	64.4%
% population with improved sanitation	46.4%	79.3%	63.6%	22.1%	39.1%	27.1%	22.6%	40.7%	29.6%

Source: World Development Indicators (electricity, sanitation, and water World Bank WDI 2012; mobile and fixed-line telephone subscriptions World Bank WDI 2014). Note: SSA=Africa south of the Sahara.

al. (2010) evaluate the potential for further irrigation in Africa, and find that both small-scale and large-scale, dam-based irrigation programs could be expanded significantly, particularly if costs are offset by hydropower revenues or other sources. However, Foster (2008) notes that the high proportion of large-scale irrigation infrastructure currently in need of rehabilitation demonstrates the difficulties of maintaining such programs.

Table 8.4 shows the results of the latest enterprise survey done by the World Bank. As expected, SSA performs poorly in many of the indicators, with particular problems with energy, access to electricity, and transportation costs.

Finally, it is important to mention that while overall access trends are not encouraging, some African countries are doing relatively well at expanding

TABLE 8.4—ENTERPRISE SURVEY AVERAGES BY REGION (INFRASTRUCTURE)

Survey question	East Asia and Pacific	Eastern Europe and Central Asia	High income, non-OECD	High income, OECD	Latin America and Caribbean	Middle East and North Africa	South Asia	Africa south of the Sahara
Number of electrical outages in a typical month	3.5	2.0	1.3	0.4	2.8	17.6	25.5	8.3
Duration of a typical electrical outage (hours)	2.0	1.2	0.9	0.4	1.5	6.5	3.0	4.6
If there were outages, average duration of a typical electrical outage (hours)	3.8	3.5	2.8	2.9	2.7	9.7	4.5	6.3
Losses due to electrical outages (% of annual sales)	1.6	1.2	0.3	0.1	1.3	4.7	6.5	4.4
If there were outages, average losses due to electrical outages (% of annual sales)	3.0	2.9	0.8	0.9	3.4	6.9	11.0	7.3
Percentage of firms owning or sharing a generator	36.1	21.3	22.4	13.1	26.8	41.0	46.6	48.0
Proportion of electricity from a generator (%)	7.2	2.5	1.6	0.4	4.8	15.9	12.4	14.2
If a generator is used, average proportion of electricity from a generator (%)	20.6	11.9	9.4	4.7	20.2	34.8	23.8	26.8
Days to obtain an electrical connection (upon application)	31.1	26.6	30.7	42.8	22.2	41.1	54.2	29.0
Percentage of firms identifying electricity as a major constraint	22.6	17.9	31.1	21.8	37.9	40.5	45.0	43.6
Number of water insufficiencies in a typical month	0.9	0.4	0.3	0.0	0.7	2.7	1.5	2.0
Proportion of products lost to breakage or spoilage during shipping to domestic markets (%)	1.1	0.8	0.6	0.7	1	1.6	1.2	1.6
Percentage of firms identifying transportation as a major constraint	13.9	8.5	17.4	11.8	24.2	21.2	21.5	28.1

Source: World Bank Enterprise Surveys conducted between 2009 and 2015.

Notes: OECD = Organisation for Economic Co-operation and Development.

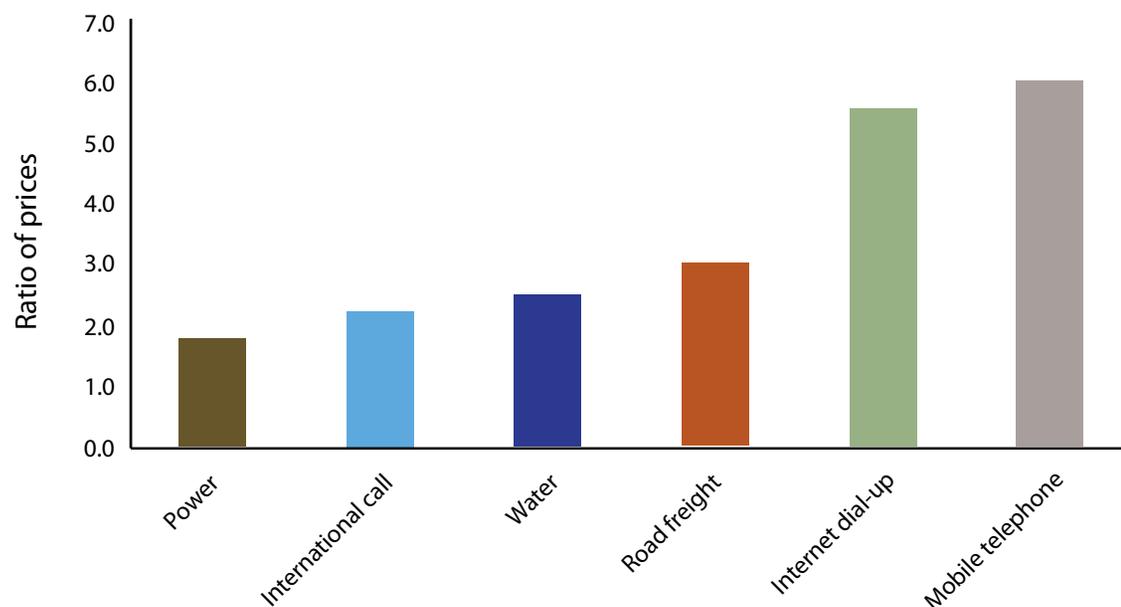
access to improved water sources. With the exceptions of Ethiopia and Uganda, these stronger performers tend to be francophone countries. There does not appear to be any unique set of factors that explains the better performance of these more successful countries.

Costs of Access to Infrastructure

Whether one looks at power, water, road freight, mobile telephones, or Internet services, the tariffs paid in Africa are several multiples of those paid in other parts of the developing world, as shown in Figure 8.6. The explanation for Africa's higher prices sometimes lies in genuinely higher costs; at other times it reflects relatively high profits. The policy prescriptions are, of course, radically different in each case.

Although rural areas are generally characterized by poor access to infrastructure, poor households within those rural areas have the least access. In Papua New Guinea, the poor travel 75 percent longer than others to reach the closest mode of transportation and more than three times longer to reach the closest road (Gibson and Rozelle 2003, p.167). Although there might be a relationship between the choice of a location with respect to its infrastructure and a household's poverty status, implying that a nonpoor household might select a location with good infrastructure and a poor household might

FIGURE 8.6—COSTS OF ACCESS TO INFRASTRUCTURE SERVICES, SSA RELATIVE TO OTHER COUNTRIES IN THE WORLD



Source: Foster (2008). Note: SSA=Africa south of the Sahara.

select a location with bad infrastructure, availability of infrastructure can influence the poor household's status. In fact, evidence shows that access to infrastructure is a significant factor in a household's poverty status.⁶⁰

The development of an efficient regional transportation infrastructure has remained elusive in most parts of SSA. This hinders regional and international trade and is a major barrier for landlocked countries. For example, importers in the Central African Republic and Chad pay cost, insurance, and freight (c.i.f.) prices that are 1.3 to 1.8 times the cost of the

⁶⁰ See, for instance, Gibson and Rozelle (2003, p.177), who showed the strong impact of access to roads on household poverty in rural areas of Papua New Guinea.

products when they left the exporting countries. Similarly, c.i.f. prices for coffee exported from the Central African Republic and Chad, on arrival in Europe, are 2.8 times the production cost (OED 1995).

According to Reinikka and Svensson (1999), poor infrastructure services are partly responsible for disappointing domestic private

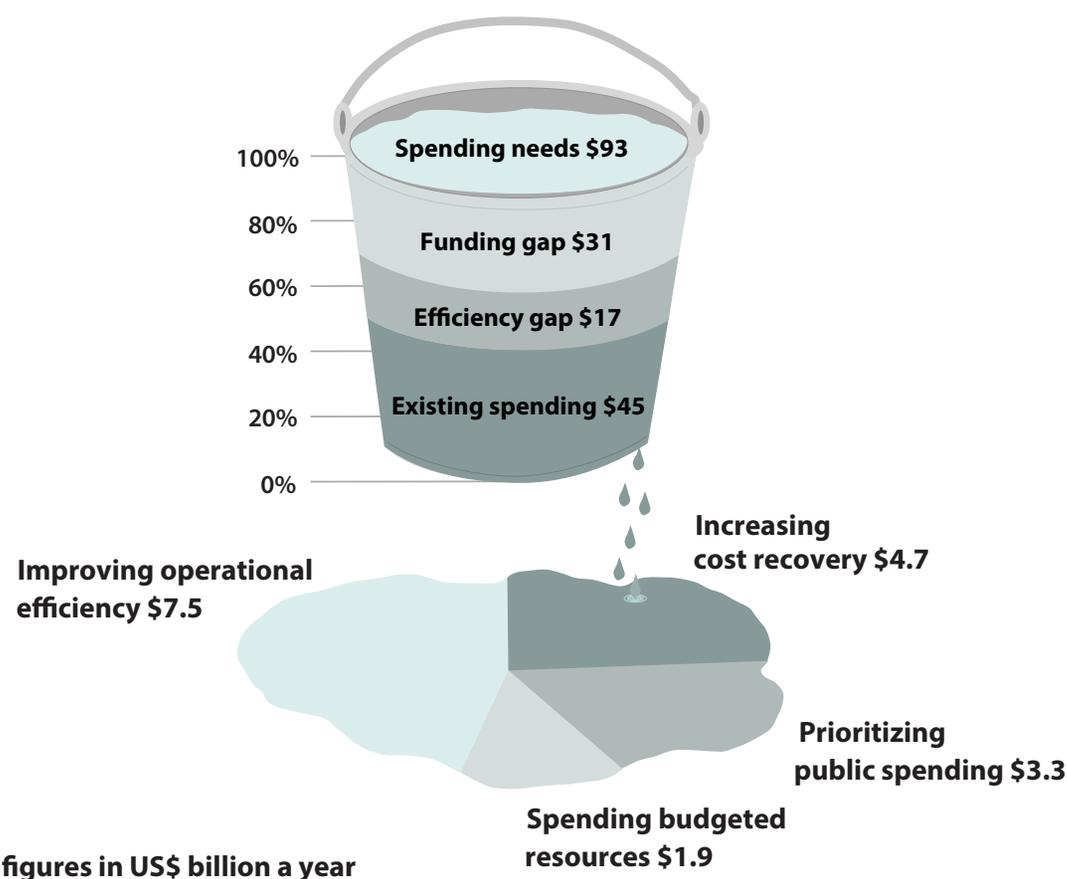
investment and foreign direct investment response in SSA. Although firms can substitute for deficient infrastructure services by investing privately, such substitutions impose additional costs. Moreover, some types of infrastructure services—such as transport infrastructure—cannot be easily substituted.

Investment Gap

The cost of addressing the significant infrastructure gaps previously mentioned has been estimated at about US\$100 billion per year (US\$93 billion per year according to the Africa Infrastructure Country Diagnostic [AICD] report, Africon 2008, see Figure 8.7). The existing spending is US\$45 billion per year, and efficiency gains can garner around US\$17 billion per year, which means there is a need for an additional US\$31 billion of investment to arrive at the US\$93 billion per year. In addition, a further US\$37 billion per year will be needed in operations and maintenance.

The largest investments are for the power sector, where regional projects represent an important share of the total. The next important items are water and sanitation, and transport, respectively, which together add up to about the same financial requirements as the power sector (Estache and Wodon 2014). In total, this

FIGURE 8.7—DECOMPOSITION OF INVESTMENT NEEDS



Source: Briceño-Garmendia, Smits, and Foster (2008) and Africon (2008). Presentation designed by World Bank.

requirement is estimated to be between 12 and 15 percent of the GDP (Briceño-Garmendia, Smits, and Foster 2008; Estache and Wodon 2014, respectively). The needs imply on average doubling investment trends and even tripling them if maintenance is included.

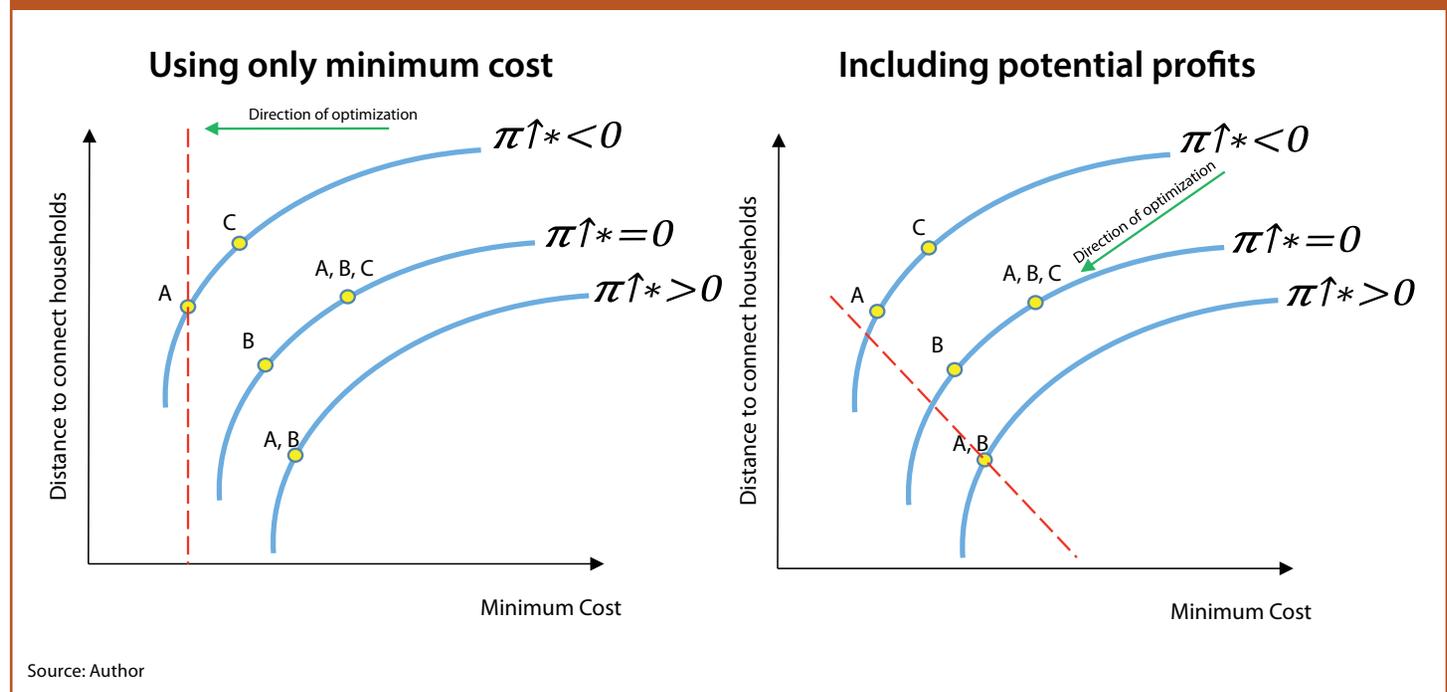
Prospects and Policy Recommendations

There is a growing consensus that providing adequate infrastructure is crucial to poverty alleviation and income inequality reduction. SSA is a special case; it is characterized by adverse geography and low population density relative to other developing regions. There exist several estimates for the investments needed in Africa's infrastructure sector. The main consensus is that there is a need to invest around US\$100 billion (+/- US\$93 billion) a year to reduce the infrastructure gaps and meet the needs imposed by the growth targets underlying the Millennium Development Goals; this is double what is currently being spent. Even after accounting for the existing investments and potential gains in efficiency, there will still be a gap of

around US\$31 billion a year. Moreover, if we add investment, operation, and maintenance requirements at the country level, this number represents a minimum of 9 percent and as much as 15 percent of the GDP in many countries. In other words, we will need to triple the average expenditure in Africa's infrastructure sectors (Estache and Wodon 2014).

How investments are financed matters and is directly linked to the institutional development of each country. We need to develop an appropriate strategy of prioritization linked to the capacity of governments to absorb and properly monitor this investment

FIGURE 8.8—OPTIMIZATION OF ELECTRIC GRID USING MINIMUM COST AND INCLUDING POTENTIAL PROFITS



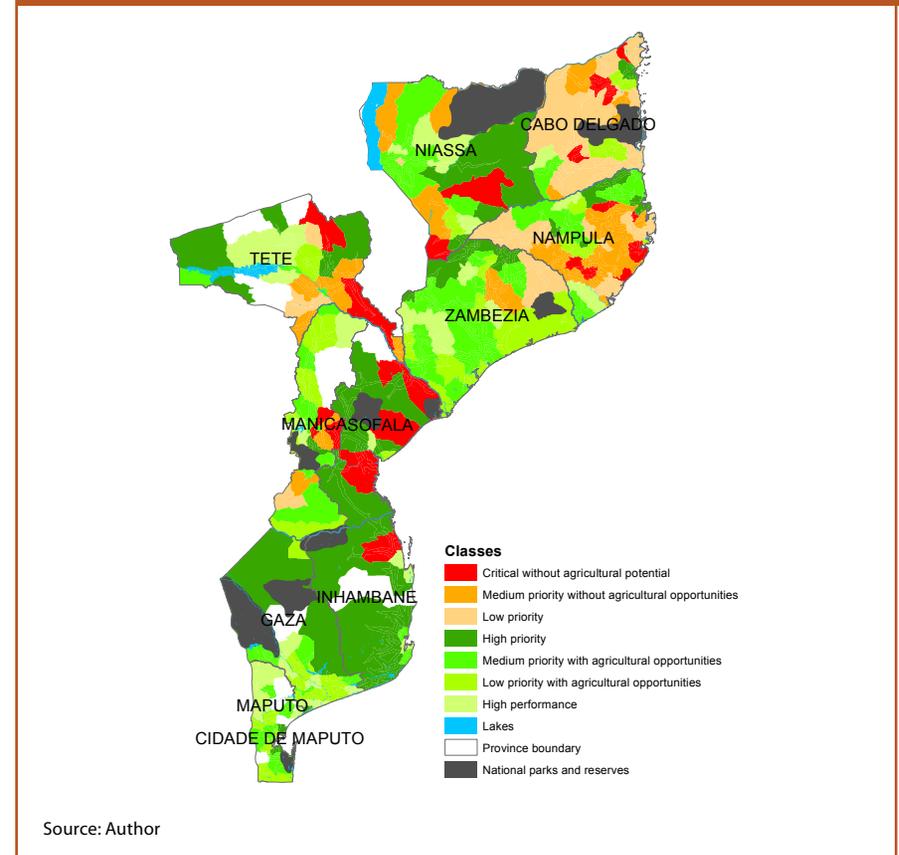
How to Prioritize

Given the significant budget and absorption constraints faced, it is essential that African governments carefully assess and prioritize their needed investments. The evidence suggests that policymakers and program designers normally solve a cost minimization problem when deciding where to extend an existing electric grid or invest in a road. Little attention seems to be paid to profit maximization—that is, taking into account that more remote (and thus more expensive) areas might have high productive potential that would be realized by new access to roads or electrification, thus making the investment ex post profitable. The duality of cost minimization and profit maximization depends on the quasi-concavity of the production function and complete markets, situations that are not characteristic of the electricity, road, ICT, and water sectors. This implies that different decisions would result from using cost functions versus profit functions as objective functions.

To illustrate the point, suppose that we have three households, A, B, and C, that we want to connect to the electric grid. As shown in Figure 8.8, if we connect household A at minimum cost, we obtain negative profits and connect only household A and adjacent households. If we include the potential profits that can be obtained from connecting A to B and C, we would arrive at a different conclusion, finding allocation that maximizes profit at a minimum cost. We arrive at point (A, B), where profits are positive and households A, B, and those adjacent are connected to the grid. Note that it is not always profitable to connect all households, as evidenced by the position of point (A, B, C) at the zero isoprofit curve.

Potential profits can be included by using the agricultural potential to proxy for potential profits (see Torero 2014). Rural areas, as shown in green in Figure 8.9 for Mozambique, are areas that have agricultural production

FIGURE 8.9—AGRICULTURAL TYPOLOGY AREAS TO IDENTIFY MAXIMUM PROFITS



potential and consequently could see higher returns from being connected to an electrical grid or better roads. Under this framework, we would prioritize the areas that have high potential (dark green) to maximize profits. While we do not assert that there are no merits to connecting households with low productive potential (those in red), this framework provides us with some idea of expected outcomes in these areas in terms of projects' cost effectiveness and sustainability.

The African Union's Program for Infrastructure Development in Africa (PIDA) and the NEPAD/AU Presidential Infrastructure Championing Initiative (PICl) will need to be re-evaluated taking into account the optimization criteria described above.⁶¹

We must also increase coordination among different infrastructures in order to maximize the complementarities of the investments. Large projects can provide an opportunity to explore complementarities with other infrastructure programs, such as mobile telephony, road access, and improved water and sanitation access; these projects can help in determining the most welfare-enhancing policy options in rural areas, especially for poor rural households (see Escobal and Torero 2005).

How to Finance the Infrastructure Gap

Forging private-public partnerships seems to be the most efficient way of closing the access gap in all services covered. Public intervention alone is usually not cost effective, and isolated private initiatives often fail to deliver all services.

In both the telecommunications and electric service sectors, the best method seems to be an international bidding process to allocate the service in each geographical area using output-based contracting financed through ad hoc public funds. In this process, the state agency defines service standards and sets price caps for a target area. Private companies compete for the contract by offering the lowest financing requirement from the government. The regulatory office supervises contract obligations and fines the private firm if it fails to deliver quality service in due time. However, it is important to mention that

the remoteness and small scale of individual connections have made it hard to implement an effective monitoring system to measure performance against output targets.

Another core issue is that funding has usually been centrally administered. In addition, utilities have found it hard to move away from using "hidden" subsidies. The participation of all institutions involved (private operators, consumers, the central government, and regional governments) is essential, not only to better assign and supervise projects but also to clearly identify the needs and demands of rural areas.

At present, the estimation of rural infrastructure investment is generally based on the needs assessed for each sector at the national level, with little or no assessment of demand and coordination at the local level. More often than not, such investment assessments do not reflect the preferences of users and the contingencies of services. For instance, demand for secondary schooling may be contingent on access roads, and failing to coordinate these two needs may result in a mismatch between the availability of a service and its actual use. On the other hand, it is important for communities to choose the technology they want to use and the service level they require, and to have a clear understanding of long-term costs and maintenance implications so they can choose what is most appropriate for them under their budget constraints. There is evidence that if provided with appropriate information and technical support, communities can make informed choices about service options, as well as clearly identify their willingness to pay, thereby assuming ownership and responsibility for the infrastructure.

⁶¹ African Heads of State and Government adopted PIDA at the 18th AU Summit held in Addis Ababa, Ethiopia in January 2012. PIDA and the NEPAD/ AU Presidential Infrastructure Championing Initiative (PICl) are initiatives in support of closing the infrastructure gap vital for Africa's transformation. PIDA is a continental initiative aimed at establishing a common agenda for mobilizing resources for the effective expansion and maintenance of infrastructure in Africa.

A successful private-public partnership mechanism requires that a regulatory office be established and that some reforms have already taken place. This could be an important constraint in countries that lack the required legal and institutional framework. In such cases, other mechanisms could be deemed an adequate second-best solution. In the case of rural road maintenance, the use of specific road funds to secure resources for maintenance, and the use of output-based, lump-sum, and multiyear contracts are the best practices. This could be a complementary strategy although, depending on the legal framework, contracts could be enough to both secure funds and ensure efficient rehabilitation and maintenance of low-traffic roads.

Infrastructure Should Be Integrated at the Regional Level

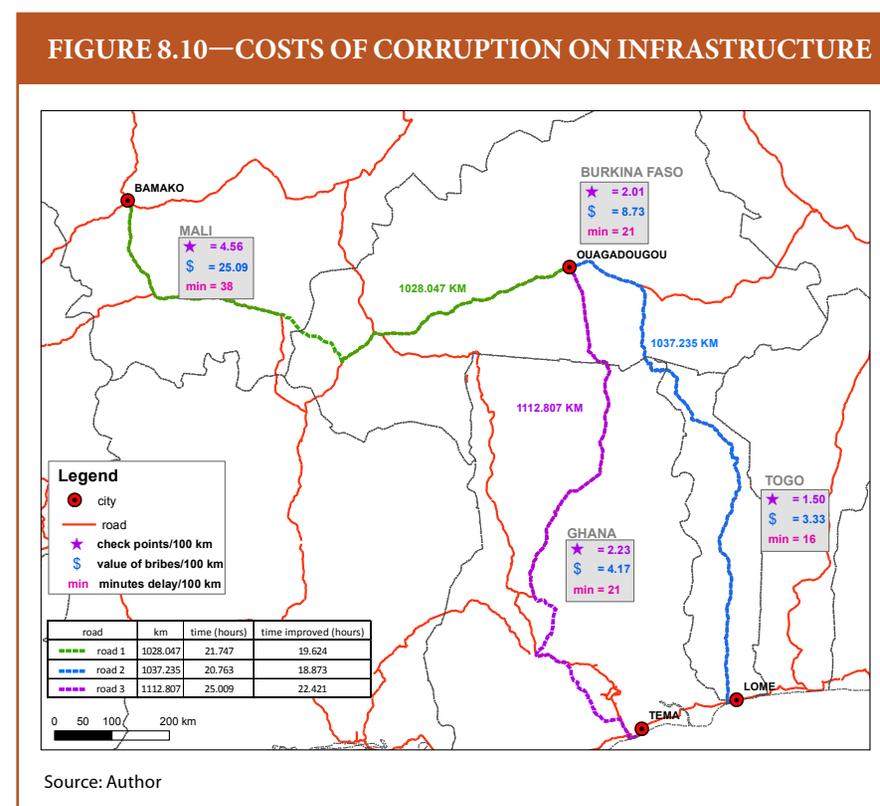
Finally, infrastructure in SSA is a regional problem, and therefore an integrated regional approach is needed. For example, improvement of roads and ports in Tanzania can help landlocked countries such as Uganda and Malawi to transit their trade more efficiently. Therefore, Uganda and Malawi have a direct stake in the improvements of roads and ports in Tanzania, and reforms need to be addressed together. It is essential that economies of scale and externalities be assessed collectively for key infrastructures. Some initial initiatives are currently underway, like the West Africa power pool and the Zambia-Tanzania-Kenya power interconnector, but many more are needed.

There is also a lack of coordination at the country, regional, and donor levels, where the linkages and complementarities of infrastructure investment have not been realized. In many cases, access to infrastructure has not been linked to poverty alleviation strategies or to countries' general development goals. It is necessary to take an integrated approach even if the actual design may vary from country to country.

Governance and Accountability

Resources are needed from official development assistance (ODA), the private sector, and governments, but nothing will work if the appropriate governance and accountability is not in place. First is the need to reduce bribes and tolls that could siphon off all the benefits of a road improvement, as shown in Figure 8.10. There is also a pressing need to reduce corruption and offer incentives for proper work.

Second, monitoring systems and institutional designs for basic accounting and regulation are all needed, and SSA needs to learn from other regions' best practices at all levels.





CHAPTER 9

Tracking Key CAADP Indicators and Implementation

Godfrey Bahigwa, Samuel Benin, Wondwosen Tefera, and Samson Jemaneh

Introduction and Progress in the CAADP Implementation Process

In June 2014, heads of state and government of the African Union (AU) adopted the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods, during the Twenty-Third Ordinary Session of the AU Assembly, in Malabo, Equatorial Guinea. In the Malabo Declaration, African leaders recommitted themselves to the principles and values of the Comprehensive Africa Agriculture Development Program (CAADP) process. Specifically, they committed themselves to mutual accountability for actions and results through a systematic regular review process using the CAADP Results Framework (AUC and NPCA 2015). The revised Results Framework, with 40 prioritized indicators, builds on the previous CAADP monitoring and evaluation framework (see Benin, Johnson, and Omilola 2010). Since 2008, the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) has been supporting the African Union Commission (AUC) and the NEPAD Planning and Coordinating Agency (NPCA) in tracking and reporting on more than 30 CAADP indicators in its Annual Trends and Outlook Report (ATOR), which is produced at continental and regional levels. Established by the CAADP Partnership Platform and later endorsed by the AU's Conference of African Ministers of Agriculture, ReSAKSS maintains an interactive website (www.resakss.org), where the indicators can be freely accessed in the form of maps and charts, and their data can be downloaded in Microsoft Excel. The revised CAADP Results Framework has new indicators related to areas that were previously not tracked, including resilience, private sector, climate change, natural resource

management, and some CAADP support processes. As such, ReSAKSS is expanding the database to include the new indicators. The annex of the ATOR, starting with the 2014 ATOR, will include data and analyses of the indicators in the revised CAADP Results Framework.

The revised CAADP Results Framework outlines 40 indicators for tracking progress across three levels of outcomes, outputs, and inputs. Level 1 includes the high level outcomes and impacts to which agriculture contributes, including wealth creation; food and nutrition security; economic opportunities, poverty alleviation, and shared prosperity; and resilience and sustainability. Level 2 presents the outputs from interventions intended to transform the agriculture sector and achieve inclusive growth: agricultural production and productivity; increased intra-African regional trade and functional markets; expanded local agro-industry and value-chain development, inclusive of women and youth; increased resilience of livelihoods and improved management of risks in agriculture; and improved management of natural resources for sustainable agriculture. Level 3 presents inputs and processes required to strengthen systemic capacity to deliver CAADP results and create an enabling environment for agricultural transformation to take place: effective and inclusive policy processes; effective and accountable institutions, including assessing implementation of policies and commitments; strengthened capacity for evidence-based planning, implementation, and review; improved multisectoral coordination, partnerships, and mutual accountability in sectors related to agriculture; increased public and private investments in agriculture; and increased capacity to generate, analyze, and use data, information, knowledge, and innovations.

The key indicators of progress in the CAADP implementation process include signing CAADP compacts, developing CAADP national agricultural investment plans, accessing the Global Agriculture and Food Security Support Program (GAFSP), undertaking agriculture Joint Sector Review (JSR) assessments, and membership in the New Alliance for Food Security and Nutrition and Grow Africa partnerships. This progress is summarized in Table L3.1.1. As of July 2015, 42 out of 54 AU member states had signed CAADP compacts, and 30 of them had developed related national agriculture and food security investment plans (NAFSIPs). The NAFSIPs provide detailed implementation plans for achieving the goals and targets in the CAADP compacts. Following the signing of the compact and the development of a NAFSIP, countries hold a business meeting to discuss, among other things, the financing of the plan. The governments lead the process by presenting priorities in the NAFSIP, their own resources to finance the plan, and the financing gap that needs to be filled. By July 2015, 26 countries had held business meetings. To help countries finance the gaps in their NAFSIPs and achieve their targeted outcomes, GAFSP was created in 2010. To date, 17 countries in Africa have been approved for grants totaling more than \$611.5 million. In addition to GAFSP, other CAADP supporting initiatives are aimed at improving the pace and quality of implementation at the country level. For example, 10 African countries have signed cooperation agreements under the New Alliance for Food Security and Nutrition, which define commitments by various partners, including government, the private sector, and development partners. Another example is Grow Africa, which arose from the World Economic Forum to attract and support private sector investment in Africa's agriculture sector; 12 countries to date are participating in the partnership. Even after signing

CAADP compacts and developing NAFSIPs, countries still face questions about implementation that need to be answered. Countries need to track and report to their stakeholders progress made in implementation of their NAFSIPs. Yet, several governments' capacity for analysis and M&E is weak. To fill this gap, ReSAKSS has been working to support countries to establish country SAKSS platforms that are aimed at improving the quality of policy analysis, review, and dialogue, with the ultimate goal of improving the quality of NAFSIP implementation. Nine country SAKSS platforms have been established in the last three years, and at least another 3 SAKSS platforms are expected to be established before the end of March 2016.

A key CAADP principle guiding the implementation of NAFSIPs is creating strong partnerships and accountability. The Malabo Declaration specifically calls for strengthening mutual accountability for actions and results during the second phase of CAADP implementation. Agricultural JSRs are one way of operationalizing mutual accountability. JSRs provide an inclusive, evidence-based platform for multiple stakeholders to jointly review progress; hold each other accountable for actions, results, and commitments; and, based on gaps identified, agree on future implementation actions. To strengthen mutual accountability, as called for in the Malabo Declaration, ReSAKSS was tasked by AUC and NPCA to assist countries in enhancing existing review processes. In collaboration with Africa Lead, ReSAKSS initiated and completed agricultural JSR assessments in 7 countries in 2014. These assessments were aimed at examining existing agricultural review mechanisms (at the country level) against best JSR practices, and identifying areas that need strengthening in order to help countries achieve JSR processes that are technically robust, more comprehensive in terms of thematic coverage, and more inclusive of

non-state actors. In 2015, 11 more countries were added, bringing the total to 18 countries that will have undertaken JSR assessments by the end of the year. The experiences and lessons learned during the JSR assessments will be used in supporting AUC and NPCA in the Malabo Declaration biennial review process, leading to the production of the first continental report, which will be presented at the Summit of heads of state and government of the African Union in January 2018.

The following sections assess Africa's performance on 15 of the 40 indicators of the CAADP Results Framework for which data are readily available. The other indicators will be added gradually in subsequent ATORs and on the ReSAKSS website as data becomes available. ReSAKSS will also continue to present data for indicators that were reported on previously and which remain of interest to stakeholders, especially on the ReSAKSS website. The indicators are presented in five different breakdowns: (1) for Africa as a whole; (2) by AU's five geographic regions (central, eastern, northern, southern, and western); (3) by four economic categories (countries with less favorable agricultural conditions, countries with more favorable agricultural conditions, mineral-rich countries, and middle-income countries); (4) by the eight regional economic communities (CEN-SAD, COMESA, EAC, ECCAS, ECOWAS, IGAD, SADC, and UMA);⁶² and (5) by the period during which countries signed the CAADP compact (CAADP 2009, CAADP 2011, CAADP 2014, and non-CAADP).⁶³ For most indicators, post-CAADP levels

(average levels from 2003–2008 and 2008–2014) are compared with levels of the pre- CAADP base period of 1995–2003.

Wealth Creation

Africa as a whole has experienced robust economic growth in the last 20 years. Gross domestic product (GDP) per capita increased from an annual average of US\$987 in 1995–2003, to \$1,154 in 2003–2008, and even higher in 2008–2014, reaching an annual average of \$1,289.⁶⁴ As Table L1.1.1 shows, all regional classifications had increasing rates of growth in GDP per capita, especially in eastern, southern, and western Africa. However, during 2008–2014, the rates of growth slowed, especially in southern Africa, which grew by less than 1 percent per year. The slowdown in economic growth is attributed to broader developments in the global economy, notably the ripple effects of the fuel and financial crises of 2007 and 2008. Overall, CAADP countries grew faster than non-CAADP countries.

Food and Nutrition Security

Measures of hunger and malnutrition (undernourishment, underweight, stunting, and wasting) are improving across Africa, albeit very slowly.

The prevalence of undernourished population showed continuous decline across Africa, geographic regions, economic regions, and all regional economic communities (RECs) over the last 20 years, although the rates of decline were lower during 2008–2014 than during 2003–2008 (Table

⁶² CEN-SAD, the Community of Sahel-Saharan States; CEMAC, the Economic and Monetary Community of Central Africa; COMESA, the Common Market for Eastern and Southern Africa; EAC, the East African Community; ECCAS, the Economic Community of Central African States; ECOWAS, the Economic Community of West African States; IGAD, the Intergovernmental Authority for Development; SACU, the Southern African Customs Union; SADC, the Southern African Development Community; and UMA, the Arab Maghreb Union.

⁶³ CAADP 2009 are countries that signed the compact by December 2009, CAADP 2011 countries signed between January 2010 and December 2011, CAADP 2014 countries signed between January 2013 and December 2014, and non-CAADP countries are those that have not yet signed a CAADP compact.

⁶⁴ All dollars in this chapter are US dollars.

L1.2.1). While all classifications experienced declining levels in recent years, high levels of undernourishment are still present, especially in eastern Africa, countries with more favorable agriculture conditions, mineral-rich countries, EAC, and IGAD.

The prevalence of *underweight* children under five years of age has been declining across Africa as a whole, from 24.6 percent recorded in 1995–2003 to 22.2 percent in 2003–2008, and further down to 20.6 percent in 2008–2014. The extent of decline was relatively higher in 2003–2008, at an average decline of 1.66 percent compared with the 0.7 percent average decrease recorded in 2008–2014. The northern region not only had the least prevalence of underweight children, it also registered the highest decline among all regions in both 2003–2008 and 2008–2014. The western region had the highest prevalence of underweight children, at 25.9 percent in 2003–2008, and experienced a slight decrease of 0.12 percent per year in 2008–2014 (Table L1.2.2A).

Stunting levels are still very high in Africa, at more than 35 percent for children under five years of age. However, levels are declining across the continent at an annual average of 1.0 percent (Table L1.2.2B). The prevalence of *wasting* among children under five years of age showed similar trends, declining across the continent from 10.9 percent in 1995–2003 to 10 percent and 9.4 percent in 2003–2008 and 2008–2014, respectively. The one exception is the northern region, which showed the prevalence of wasting unchanged at 6.2 percent in 2003–2008 and 2008–2014; in all the other regions, the incidence of wasting among children consistently decreased (Table L1.2.2C). The western region had the highest incidence of wasting throughout the review period, while the southern region had the lowest incidence.

Poverty

In Africa as a whole, the incidence of poverty has been declining, along with its depth, as measured by the *poverty gap index* (PGI), which declined from 15.5 percent in 1995–2003 to 12.5 percent in 2008–2014 (Table L1.3.3). Despite the slowdown in GDP per capita growth during 2008–2014 (Table L1.1.1), poverty fell faster during this period, at an annual rate of 2.64 percent, than during 2003–2008, at 1.46 percent per year. The PGI indicates the resources that would be needed to bring the poor out of extreme poverty and up to the poverty line, with southern Africa needing the most and northern Africa needing the least resources among the geographic regions. This pattern is also reflected among the RECs, where SADC needs more resources to bring its poor people out of poverty than other regions, relative to its population and poverty line.

In Africa as a whole, the *headcount poverty rate* at the international poverty line of \$1.25/day has dropped moderately but consistently, from 45.5 percent in 1995–2003 to 42.0 percent in 2003–2008, and to 38.2 percent in 2008–2014 (Table L1.3.4). All regions, economic classifications, and RECs showed the same consistent reduction in poverty. All regions, except the western region, mineral-rich countries, ECOWAS, and CAADP 2009 countries, had poverty levels below 50 percent during 2008–2014, with the northern region registering the lowest poverty incidence, at 3.3 percent of its population. However, poverty reduction appears to be accelerating. The average annual percentage reduction in poverty during 2008–2014 was greater than the annual average reduction during 1995–2003 for Africa as a whole, with varied performances among regions and economic groups.

Agricultural Production and Productivity

Agriculture sector growth in Africa increased remarkably between 1995–2003 and 2003–2008, expanding at an annual rate of 3.77 percent, although this was still lower than the CAADP target of 6 percent (Table L2.1.1). The rate of growth decreased to 2.61 percent during 2008–2014, largely because of poor performance in the western region, whose *agriculture value-added* declined at an annual average rate of 1.48 percent during that period. The central region realized significant growth in 2003–2008, at 7.95 percent per year, and was the only region that achieved the CAADP target during that period. During 2008–2014, that distinction went to the eastern region which achieved a growth rate of 6.63 percent. Similar variations are observed across economic classifications and RECs, with countries with more favorable agricultural conditions, EAC, and IGAD experiencing agricultural growth rates of more than 6 percent in 2008–2014. In general, all CAADP countries experienced robust growth during 2003–2008 and 2008–2014, except the CAADP 2009 countries in the latter period, which experienced an annual decline of 0.52 percent in their agriculture value-added, largely due to the influence of Nigeria; most of the other CAADP 2009 countries experienced moderate to rapid agricultural growth.

The total volume of agricultural production has been rising across the continent, regardless of geographical location, economic classification, or adoption of the CAADP framework. The *agricultural production index* (2004–2006=100) for Africa as a whole rose from 80.68 in 1995–2003, to 100.83 in 2003–2008, and to 117.51 in 2008–2014 (Table L2.1.2). However, the rates of increase in agricultural production were higher in CAADP countries than in non-CAADP countries.

Labor productivity (measured as agriculture value-added per agricultural worker) and *land productivity* (measured as agriculture value-added per hectare of arable land) have risen over the last 20 years across Africa as a whole, with variations among regions and economic classifications (Tables L2.1.3 and L2.1.4). Labor productivity grew faster during 2003–2008, at 1.61 percent per year, than during 2008–2014, when it grew by 0.61 percent per year. Among geographic regions, the highest labor productivity was recorded in the northern region and lowest in the eastern region, largely because of higher rates of mechanization in the former region. Among the RECs, labor productivity is highest in UMA and lowest in EAC, consistent with geographical observations. Land productivity exhibits trends similar to labor productivity, with the northern region having the highest rates and eastern and southern Africa having the lowest rates, largely explained by the higher rates of fertilizer consumption in northern Africa.

Cereal yields, measured in kilograms per hectare (kg/ha), represent another measure of agricultural productivity. They consistently increased across Africa as a whole, from 1,261 kg/ha during 1995–2003 to 1,540 kg/ha during 2008–2014 (Table L2.1.5). Cereal yields increased most in eastern and western Africa during 2003–2008, and least in northern Africa, although the northern region had the highest annual average cereals yield of 2,667 kg/ha in that period. During 2008–2014, eastern and southern Africa had the highest rates of growth in cereal yields, but still their yields are less than half of those in the northern region. Among the RECs, COMESA had the highest cereal yield in 2008–2014, with 1,898 kg/ha, followed by SADC, with 1,729 kg/ha; ECCAS had the lowest cereal yield during the period. Cereal yields improved during 1995–2003 and 2008–2014 for all economic communities.

These variations across the continent indicate that most parts of Africa still have great potential to double or even triple cereal yields.

Agriculture Sector Expenditure

The volume of public resources invested in agriculture has increased tremendously over the last 20 years. The country average in Africa increased from \$128.55 million in 1995–2003 to \$186.4 million in 2003–2008, and to \$219.62 million in 2008–2014 (Table L3.5.1). The highest growth in public expenditure for Africa as a whole was recorded in 2003–2008, at 6.6 percent per year, but slowed down to 2.32 percent per year during 2008–2014. The northern region has the highest country average expenditure levels, and the central region has the lowest. CAADP countries increased their expenditure in agriculture faster during 2003–2008 than during 2008–2014, when both

fiscal revenues and official development assistance experienced significant declines resulting from the global food and financial crises.

While the volume of resources spent in agriculture has increased across all regions and economic groupings, the *share of public agriculture expenditure* in total public expenditure has been less than 4 percent for Africa as a whole, thus failing to reach the CAADP target of 10 percent (Table L3.5.2). None of the regions or economic groups met the CAADP expenditure target during 2003–2008 or 2008–2014, although some member countries met the target.

The *share of agriculture sector expenditure* in total agricultural GDP rose from 5.14 percent in 1995–2003 to 6.11 in 2003–2008, but declined slightly to 5.79 percent during 2008–2014—still higher than the pre-CAADP period (Table L3.5.3). During the next phase of CAADP, it is important to maintain the momentum if the Malabo targets are to be achieved.

CHAPTER 10

Summary and Policy Implications



Africa is now one of the fastest-growing regions in the world. Economic growth on the continent has been strong over the last 15 to 20 years. The growth comes after decades of weak economic performance; therefore, it is critical to ensure that it is sustained and accelerated. This is particularly important as the current growth has not been sufficiently broad based nor has it lasted long enough to lift the majority of the poor out of poverty. And although more African countries have attained middle-income status, a considerably large share of the population in these countries still faces extreme poverty.

Hence, it is imperative that countries design policies and programs that will not only enable them to sustain and accelerate the current recovery process but also generate high economic growth that is inclusive and creates significant employment opportunities in order to lift millions out of poverty. Africa's ability to sustain and accelerate its current growth will be determined by the effectiveness of its response to the challenges and opportunities it faces resulting from a deepening globalization, a rapid pace of urbanization, a rising middle class, a growing young population, rapidly transforming food systems, a changing climate, and more volatile global food and energy prices.

The 2014 Annual Trends and Outlook Report (ATOR) examines in depth the above developments and current and future trends that are likely to shape the course of African economies, as well as the key drivers of Africa's recent growth recovery. The report also assesses the nature and pattern of Africa's structural transformation process, past and future strategies for industrialization, changes occurring in agrifood systems, and the prospects for closing Africa's significant infrastructure gap to boost future economic growth.

Chapter 2 and Chapter 3 examine current and future trends that are likely to shape the trajectory of African economies. Chapter 2 uses IFPRI's International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) to project out to 2030 and 2050 expected trends in Africa's economic growth and agricultural supply and demand, as well as the impacts of climate change on these trends. The projection shows that Africa will see more sustained economic growth in gross domestic product (GDP) per capita between now and 2030 and now and 2050. Agricultural production and supply are both projected to continue to grow strongly between now and 2050. By 2050, Africa south of the Sahara is projected to be a net importer of half of all net exports from the world. Climate change is projected to reduce the production of cereals and fruits and vegetables, slightly increase the production of oilseeds, and have a weak impact on the production of pulses and on Africa's net trade. However, climate change is expected to result in higher agricultural prices, especially cereals.

Chapter 3 investigates megatrends that are currently shaping and likely to continue to shape African economies. The chapter identifies some of the following megatrends: more volatile food and energy prices; rapid urbanization, increasing incomes, and the rise of a middle class; rapid increase in a young population entering the labor force; greater climate variability; rising nonfarm jobs, but with agriculture likely to remain the largest source of employment; and the rapid rise in medium-scale farms.

Policy implications: To ensure that Africa's economic growth continues strong into the future as projected by IMPACT, there is need to put in place measures that can help to sustain and also accelerate the growth. These measures should include raising the level of investments necessary to increase agricultural productivity growth, such as in crop variety

improvement and improved soil and nutrient management. Infrastructure investments in irrigation, roads, and information and communication technologies (ICTs) can play an important role in improving market access for farmers and raising their competitiveness and incomes. These investments are all in line with the Malabo Declaration's goals of enhancing investments in agriculture, markets, and trade infrastructure and at of least doubling productivity and facilitating effective water management systems through agriculture.

As long-term projections show, the expected impacts of climate change on agricultural prices and production vary but can be significant and negative. Increasing investments to build the resilience of production systems and among the poor should be a high priority. Investments include those in climate-smart technologies to improve crop resistance to various stresses, such as drought, and in improved land and water management practices. Policies and programs to support the establishment of early-warning systems and response mechanisms, as well as to build the asset base of the poor through access to credit, markets, and safety nets, will also be key.

Many of the megatrends identified in chapter 3 are amenable to policy and public action. Governments, the private sector, and other development practitioners can boost agricultural productivity and competitiveness and modernize agriculture through investments in vocational and professional training to upgrade skills along agribusiness value chains, particularly the skills of young people entering the labor force, as well as through investments in technologies, such as biotechnology, to close current yield gaps. They can also respond to megatrends by increasing investments in infrastructure, such as roads and ports. Finally, in anticipation of a

sustained pace of rapid urbanization, governments can invest in improved housing, sanitation, and health facilities.

Chapter 4 examines changes that are taking place in African agrifood systems, such as rapid urbanization, the rise of a middle class, and rapid changes in the post-farmgate (midstream and downstream) segments of the supply chain—processing, transporting, wholesaling, and retailing. The chapter shows how the emergence of a middle class, urbanization, and increasing incomes have led to dietary changes that are reflected in the growing share of processed food and diversification beyond grains into horticulture, dairy, livestock, fish, and pulses. In turn, the dietary changes have led to a transformation of the post-farmgate segments of the supply chain, led mainly by rural and urban small and medium agribusinesses, which have experienced tremendous increases in their supply volumes and marketed volumes over the last 40 years. These changes have allowed farmers to increase their incomes and have increased opportunities for rural nonfarm employment. They also highlight the growing importance of midstream segments for Africa's food security.

Policy implications: Given the increasingly important role played by small and medium agribusiness enterprises along agrifood supply chains, it is important to raise their potential through public and private investments in roads, energy, and storage facilities, to improve their access to market and competitiveness through regulatory and policy reforms to create an enabling operating environment. These investments would also allow local farmers to capture a larger share of the rapidly expanding urban demand and raise their incomes. Farmers and agribusiness enterprises will also benefit from investments in innovative approaches, such as modern ICTs to

expand access to credit, inputs, agricultural extension, and other services to help them actively participate in supplying the growing markets.

Chapter 5 analyzes the characteristics and drivers of Africa's recent growth recovery. The chapter also reviews Africa's current performance against its long-term trajectory from the 1960s, and evaluates the evolution of growth strategies and policies on the continent. The analysis shows that although Africa's recent growth recovery over the last decade and a half has been strong, it has not been enough to put countries back on their growth trajectories of the 1960s. The key drivers of Africa's recent growth recovery were found to include greater macroeconomic stability, improved sector policies, increases in financing through foreign direct investment and development assistance, improvements in human resources as reflected in advances in schooling and life expectancy, and better governance, in particular improvements in rule of law and control of corruption.

Policy implications: Despite the recent growth recovery, overall economic and agriculture sector growth is still far below what it would have been, had countries maintained their growth trajectory of the 1960s. Moreover, the growth has not been inclusive enough to halve extreme poverty for the continent as a whole. Therefore, policies and investments are needed to help raise agricultural labor productivity in order to accelerate and broaden the current growth and make a greater contribution to poverty reduction.

Chapter 6 investigates the nature and pattern of structural transformation in Africa and the role played by the emerging informal goods and services sector. The sector is characterized by small and medium enterprises engaged in metal, wood, and textile works and by agribusiness enterprises engaged in processing, distribution, wholesaling,

and retailing of agricultural products for the growing middle class. The analysis demonstrates that despite being delayed, structural transformation has made a turnaround and is now contributing to growth in overall labor productivity. The chapter also shows how much of the labor exiting agriculture is entering a rapidly growing informal goods and services sector (in-between sector), and makes a case for greater attention to modernization through enterprise growth and development of this sector in future growth strategies.

Policy implications: Public and private action to help sustain and speed up Africa's recent growth are essential to deepening structural transformation on the continent. This can be achieved through investments to increase agricultural productivity and boost growth in the nonagriculture sector—not just manufacturing, but also in the informal goods and services sector, with its large and rapidly growing pool of low-productivity labor. Africa's industrial policies and strategies should promote modernization and growth of the latter sector.

Recent and expected future trends discussed in chapters 2, 3, and 4, including the growing middle class, urbanization, and diversification of diets, are all generating greater demand for domestically produced household goods and food. Therefore, strategies, policies, and investments are needed help to build the managerial and technical skills of entrepreneurs to promote product innovations, raise profitability, and stimulate enterprise growth and maturation. Investments in infrastructure (e.g., roads, energy, and communications) and regulatory and policy reforms to allow for better access to credit and address intellectual property rights will all help to lower operating costs and allow enterprises to grow

and generate more employment opportunities and incomes, and thus help contribute to poverty reduction.

Chapter 7 reviews Africa's past industrialization strategies and the current state of the industrial sector on the continent, and discusses key issues that need to be considered in any new industrialization strategies in Africa. The chapter shows that past industrialization strategies have been weak and inconsistent to make a meaningful contribution to Africa's growth and development, because of inadequate and poor infrastructure, weak institutional capacity, a shortage of managerial and technical skills, and weak business and regulatory environments. The chapter makes a case for a new industrialization strategy in Africa to help deepen structural transformation and generate more inclusive growth. The new industrialization strategy will need to address numerous factors that have led to the inadequacy of past strategies.

Policy implications: Investments in infrastructure—especially energy, transport, and water supply—can help promote sustainable industrialization. Governments will need to create an enabling business environment by ensuring sound policies and regulations to maintain macroeconomic stability and secure property rights to promote investment and innovation by the private sector. Having an enabling business environment is also key to creating industrial partnerships that help finance industrialization. To actively participate in the production of high-value-chain goods, Africa will need to invest in science, technology, and industrial training, including research and development. This investment will need to be supplemented by policies and strategies that support the development of skills in manufacturing and promote innovation.

Chapter 8 examines the infrastructure challenges faced by Africa, evaluates literature on the impact of access to infrastructure, and discusses what is required to address the infrastructure gaps and challenges in terms of investments, institutional reforms, and strategies. The chapter reveals the huge infrastructure gap still faced by Africa, especially in comparison with other developing regions, for example, in the areas of having adequate access to paved roads, electricity, and mobile phones, despite the significant increase in penetration of cellular phones in the region. The chapter points to the growing empirical evidence that shows the strong impact access to different types of infrastructure has on increasing rural incomes, particularly for smallholder farmers. According to the chapter, closing Africa's infrastructure gap will require approximately \$93 billion per year, which represents a doubling of the current infrastructure expenditures.⁶⁵

Policy implications: As governments are faced with scarce resources, closing the infrastructure gap will require them to carefully assess and prioritize investments. Government and policy planners should decide on where to invest by considering the productive potential to be unlocked and potential profits to be generated from better access to infrastructure in different geographical areas and for various value chains. The formation and strengthening of public-private partnerships can go a long way in creating the most efficient and effective opportunities and ways of funding and delivering infrastructure services, compared with independent private or public initiatives.

Governments need to create an enabling environment for public-private partnerships and markets for infrastructure services to thrive by strengthening or reforming legal and regulatory institutions.

⁶⁵ All currency is in US dollars unless specified otherwise.

Having well-functioning institutions and governance mechanisms for infrastructure development has significant impacts in terms of reducing transaction costs and increasing productivity and competitiveness for African businesses, including those in the farming and agribusiness sectors. Infrastructure investments need to be regionally coordinated to maximize on economies of scale and regional complementarities and synergies. Moreover, increased infrastructure investments, especially in market and trade infrastructure, are critical to helping realize several Comprehensive Africa Agriculture Development Programme (CAADP) goals, including halving post-harvest losses, creating job opportunities, and increasing agricultural productivity and competitiveness.

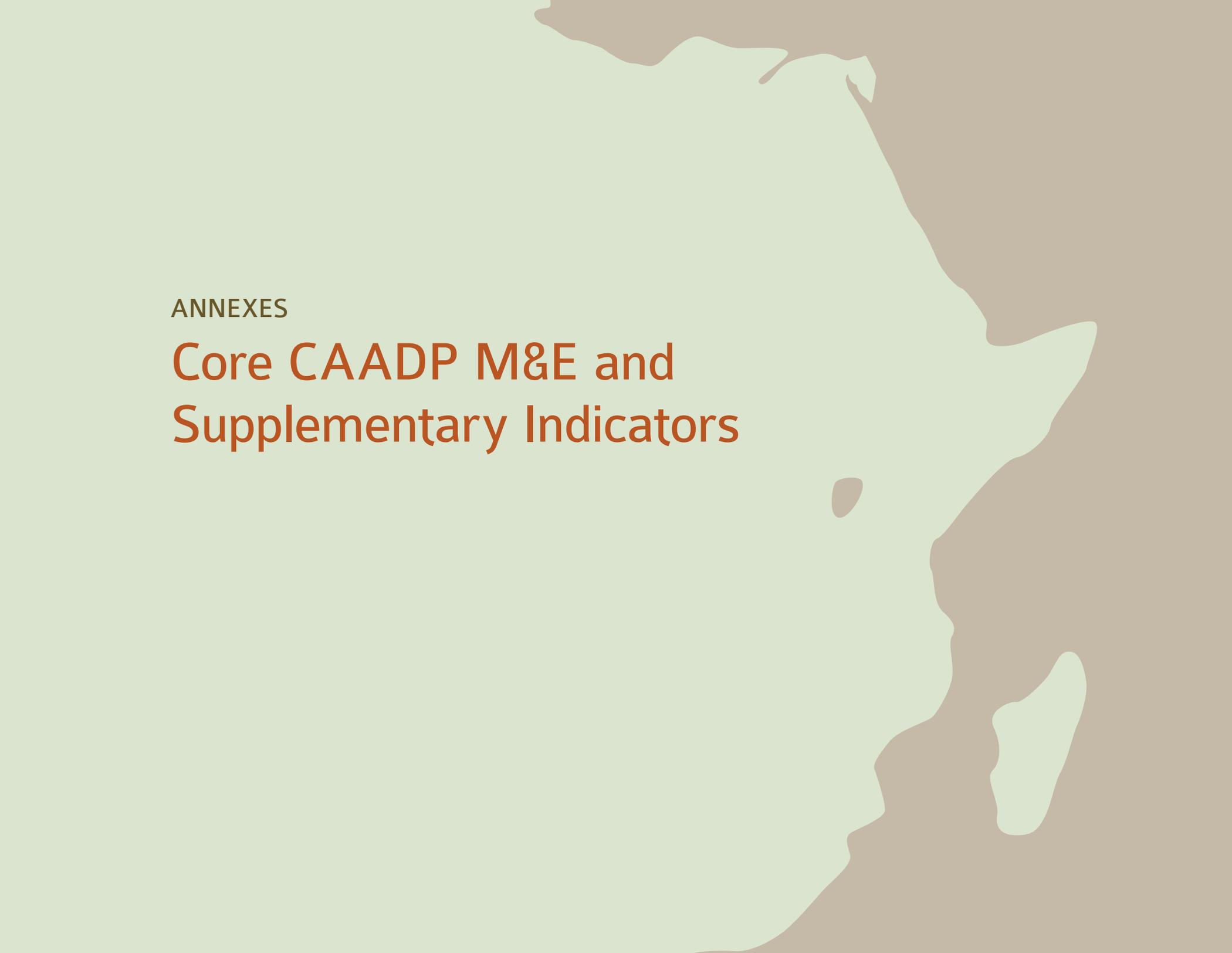
Chapter 9 of the 2014 ATOR assesses trends and progress on 15 indicators across the three levels of the CAADP Results Framework. The chapter shows that Africa's economic growth has been robust over the last 20 years: continentwide GDP per capita increased from an annual average of \$987 in 1995–2003 to \$1,289 in 2008–2014. The agriculture sector also experienced strong growth, with rates close to 4 percent during 2003–2008, before falling to less than 3 percent between 2008 and 2014, in the aftermath of the global food and financial crises. Despite this strong performance, Africa as a whole, failed to meet the 6 percent CAADP growth target for the agriculture sector.

Public agriculture expenditures, which are critical to enhancing growth in the sector, have increased remarkably over the last 20 years,

growing at an annual average rate of nearly 7 percent in 2003–2008. Average expenditures per country nearly doubled between 1995–2003 and 2008–2014, rising from around \$130 million to \$220 million. Nevertheless, the share of agriculture in total public expenditure has fallen short of the CAADP 10 percent target. It fell from an average of nearly 4 percent in 2003 to nearly 3 percent in 2014.

Indicators of the prevalence of poverty and undernourishment in the population and the prevalence of underweight, stunted, and wasted children under five years of age have all improved, albeit slowly. For example, the prevalence of underweight children declined across Africa as a whole, from 24.6 percent in 1995–2003 down to 20.3 percent in 2008–2014. The depth of poverty for Africa as a whole, measured by the poverty gap index, also declined, falling from 15.5 percent in 1995–2003 to 12.5 percent in 2008–2014.

Increased investments in the agriculture sector from both public and private sources are required to raise agricultural productivity and deepen progress toward poverty reduction and improving nutritional status in the short to medium term. Continued improvements in economic policies and governance, as well as increased investments in infrastructure and technology, not only will help sustain and broaden the current growth recovery, but will also create the conditions for achieving middle-income levels with higher employment and incomes for the majority of Africa's citizens.



ANNEXES

Core CAADP M&E and Supplementary Indicators

Annexes:

Core CAADP M&E and Supplementary Indicators

This section presents data and trends across three levels of the CAADP Results Framework (AUC and NPCA 2015) as well as supplementary data and trends.⁶⁶ The trend data are organized as follows:

Level 1—Agriculture’s Contribution to Economic Growth and Inclusive Development:

Indicator 1.1.1, GDP Per Capita (constant 2005 US\$)

Indicator 1.2.1, Prevalence of Undernourishment (% of population)

Indicator 1.2.2A, Prevalence of Underweight, Weight for Age (% of children under five)

Indicator 1.2.2B, Prevalence of Stunting, Height for Age (% of children under five)

Indicator 1.2.2C, Prevalence of Wasting, Weight for Height (% of children under five)

Indicator 1.3.3, Poverty Gap at National Poverty Lines (%)

Indicator 1.3.4, Poverty Headcount Ratio (US\$1.25/day, purchasing power parity)

Level 2—Agricultural Transformation and Sustained Inclusive Agricultural Growth:

Indicator 2.1.1, Agriculture Value-Added (billion, constant 2005 US\$)

Indicator 2.1.2, Agricultural Production Index (API, 2004–2006=100)

Indicator 2.1.3, Labor Productivity (agriculture value-added per agricultural worker, constant 2005 US\$)

Indicator 2.1.4, Land Productivity (agriculture value-added per hectare of arable land, constant 2005 US\$)

Indicator 2.1.5, Cereal Yield (kilograms per hectare)

Level 3— Strengthening Systemic Capacity to Deliver Results:

Indicator 3.5.1, Public Agriculture Expenditure (million, constant 2005 US\$)

Indicator 3.5.2, Share Of Agriculture Expenditure in Total Public Expenditure (%)

Indicator 3.5.3, Public Agriculture Expenditure as a Share of Agricultural GDP (%)

Indicator 3.1.1, Progress in the CAADP Implementation Process as of July 2015

Supplementary Data Tables

A1—Sectoral Contributions to Productivity Growth in the Total Economy, 2000–2010 (%)

A2—Percentage of Workers (Age 25+) in Agriculture, DHS Africa Sample

A3—Growth Rate in Per Capita GDP and Share of Nonmanufacturing Industry and Services in GDP (%)

A4—Growth in Trade at Current and Constant Prices for the 17 Fast-growth African Countries (2000–2012 annual average, %) and Share of Net Exports in GDP (2000 and 2012, %)

⁶⁶ Future Annual Trends and Outlook Reports (ATORs) will report on more of the CAADP Results Framework indicators as more data becomes available.

The data are presented at the aggregate level for the entire continent (Africa); the five geographic regions of the African Union (central, eastern, northern, southern, and western); eight Regional Economic Communities (CEN-SAD, COMESA, EAC, ECCAS, ECOWAS, IGAD, SADC, and UMA);⁶⁷ four economic categories that are classified according agricultural production potential, alternative nonagricultural sources of growth, and income level; and four CAADP groups representing the period during which countries signed a CAADP compact (CAADP 2009, CAADP 2011, CAADP 2014, and non-CAADP). Data for individual countries and regional groupings can be observed at www.resakss.org.

Technical Notes to Annex Tables

1. To control for year-to-year fluctuations, point estimates are avoided. Therefore, the values under the column “2003” are averages over the years 2002 to 2004 and the values under the column “2014” are averages over the years 2013 to 2014.
2. Annual average level and annual average change for 2003–2014 include data from 2003 up to the most recent year that is measured and available.
3. Annual average level is simple average over the years shown, inclusive of the years shown.
4. Annual average change for all indicators is annual average percent change, the beginning to the end years shown by fitting an exponential growth function to the data points (i.e., “LOGEST” function in excel).
5. For indicators in which there are only a few measured data points over the years specified in the range (such as poverty, which is measured once every three to five years or so), a straight-line method was used to obtain missing values for the individual years between any two measured data points. Otherwise, estimated annual average change based on the measured values is used to obtain missing values either preceding or following the measured data point. In cases where the missing values could not be interpolated, the data is reported as missing and excluded from the calculations for that time period. Any weights used for these indicators are adjusted to account for the missing data in the series of the indicator.
6. Values for Africa, the regional aggregations (central, eastern, northern, southern, and western), economic aggregations (Less favorable agriculture conditions, More favorable agriculture conditions, Mineral-rich countries, and Middle income countries), Regional Economic Communities (CEN-SAD, COMESA, EAC, ECCAS, ECOWAS, IGAD, SADC, and UMA), and CAADP groups (CAADP 2009, CAADP 2011, CAADP 2014, and non-CAADP) are calculated by weighted summation. The weights vary by indicator and weights are based on each country’s proportion in the total value of the indicator used for the weighing measured at the respective aggregate level. Each country i’s weight in region j (w_{ij}) is then multiplied by the country’s data point (x_i) and then summed up for the relevant countries in the region to obtain the regional value (y_j) according to: $y_j = \sum_i w_{ij}x_i$.

⁶⁷ CEN-SAD is the Community of Sahel-Saharan States; COMESA is the Common Market for Eastern and Southern Africa; EAC is the East African Community; ECCAS is the Economic Community of Central African States; ECOWAS is the Economic Community of West African States; IGAD is the Intergovernmental Authority for Development; SADC is the Southern Africa Development Community; and UMA is the Union du Maghreb Arabe.

ANNEX 1a: Level 1—Agriculture's Contribution to Economic Growth and Inclusive Development, Indicator 1.1.1

TABLE L1.1.1—GDP PER CAPITA (constant 2005 US\$)								
Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	987	1.24	1,057	1,154	3.54	1,289	1.27	1,331
Central	905	1.67	992	1,059	1.95	1,113	1.05	1,141
Eastern	356	1.48	380	420	4.49	498	2.21	526
Northern	1,622	2.67	1,806	1,963	3.24	2,230	1.47	2,307
Southern	2,309	0.72	2,411	2,635	4.02	2,890	0.63	2,943
Western	530	1.06	590	677	4.80	807	2.73	862
Less favorable agriculture conditions	311	1.04	336	370	3.16	412	1.99	432
More favorable agriculture conditions	306	0.68	313	371	3.22	401	3.66	437
Mineral-rich countries	392	1.54	423	509	3.47	555	3.50	599
Middle-income countries	1,500	1.57	1,629	1,909	3.85	2,013	1.15	2,072
CEN-SAD	753	1.72	825	918	4.11	1,066	1.74	1,110
COMESA	546	1.44	571	616	3.74	716	1.52	740
EAC	355	0.97	376	409	3.52	481	2.93	515
ECCAS	893	1.82	990	1,158	6.77	1,378	1.31	1,430
ECOWAS	530	1.06	590	677	4.80	807	2.73	862
IGAD	336	1.44	357	398	5.04	480	2.18	506
SADC	1,739	0.71	1,811	1,969	3.75	2,145	0.61	2,183
UMA	2,109	2.63	2,373	2,742	2.87	2,883	1.63	3,000
CAADP 2009	392	1.20	447	527	5.99	659	3.42	713
CAADP 2011	456	0.81	472	540	2.65	572	2.52	609
CAADP 2014	828	1.95	901	1,117	5.97	1,202	0.90	1,234
non-CAADP	2,410	1.84	2,616	3,000	3.35	3,147	1.08	3,232

Source: ReSAKSS based on World Development Indicators (World Bank 2015).

ANNEX 1b: Level 1—Agriculture's Contribution to Economic Growth and Inclusive Development, Indicator 1.2.1

TABLE L1.2.1—PREVALENCE OF UNDERNOURISHMENT (% of population)								
Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	24.3	-2.15	22.1	20.3	-3.56	17.6	-1.96	17.0
Central	37.0	-4.02	31.4	29.1	-2.95	24.4	-4.15	21.8
Eastern	44.2	-2.14	40.1	36.8	-3.49	32.4	-1.89	31.1
Northern	6.3	-0.76	5.9	5.7	-1.68	5.2	-1.49	5.0
Southern	28.0	-2.31	25.7	24.3	-2.26	21.3	-2.74	20.1
Western	16.0	-2.84	14.2	12.2	-6.48	9.7	-1.42	9.6
Less favorable agriculture conditions	32.4	-4.59	26.3	24.6	-2.71	20.5	-3.82	18.6
More favorable agriculture conditions	41.2	-2.18	37.7	32.5	-3.47	30.3	-2.18	28.8
Mineral-rich countries	36.1	1.97	38.4	36.1	-1.12	34.5	-1.98	33.2
Middle-income countries	12.3	-3.02	10.7	8.5	-5.55	7.6	-1.55	7.5
CEN-SAD	15.4	-2.03	14.3	12.8	-5.06	10.8	-1.30	10.6
COMESA	33.9	-2.08	31.1	29.0	-2.89	25.6	-2.07	24.6
EAC	34.9	0.02	33.9	31.4	-3.06	29.3	-0.60	29.0
ECCAS	44.2	-4.00	36.4	32.6	-4.27	25.3	-5.00	22.6
ECOWAS	16.0	-2.84	14.2	12.2	-6.48	9.7	-1.42	9.6
IGAD	47.0	-3.23	41.0	37.1	-3.94	31.7	-2.49	30.3
SADC	30.1	-0.93	29.1	27.6	-2.40	25.1	-1.51	24.2
UMA	7.4	-1.20	6.8	5.8	-2.87	5.3	-2.77	5.1
CAADP 2009	27.6	-4.27	23.0	20.4	-4.92	16.4	-2.99	15.5
CAADP 2011	31.5	-0.11	31.1	27.9	-2.77	26.7	-0.99	26.2
CAADP 2014	39.9	-2.67	35.7	29.0	-4.60	25.7	-3.89	23.4
non-CAADP	6.5	-0.89	6.1	5.8	-1.08	5.6	-0.91	5.5

Source: ReSAKSS based on World Development Indicators (World Bank 2015).

ANNEX 1c: Level 1—Agriculture's Contribution to Economic Growth and Inclusive Development, Indicator 1.2.2A

TABLE L1.2.2A—PREVALENCE OF UNDERWEIGHT, WEIGHT FOR AGE (% of children under 5)								
Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	24.6	-1.24	23.2	22.2	-1.66	20.6	-0.70	20.5
Central	28.4	-0.95	26.6	25.6	-1.36	23.4	-1.04	22.8
Eastern	29.1	-1.69	26.7	25.6	-1.82	23.8	-0.84	23.3
Northern	8.5	-2.58	8.1	6.7	-5.84	5.0	-5.54	4.4
Southern	18.3	-2.04	16.7	15.4	-3.49	13.0	-1.97	12.4
Western	28.2	-1.39	26.7	25.9	-1.01	25.0	0.12	25.8
Less favorable agriculture conditions	32.3	-1.09	31.3	31.0	-0.51	31.0	0.45	31.3
More favorable agriculture conditions	27.4	-2.04	24.8	22.4	-1.99	21.3	-1.36	20.6
Mineral-rich countries	28.6	-1.08	26.5	23.8	-1.69	22.6	-1.59	21.6
Middle-income countries	20.5	-0.86	19.8	18.2	-1.80	17.6	-0.30	18.0
CEN-SAD	23.8	-0.82	23.1	22.3	-1.17	21.7	0.41	22.4
COMESA	26.1	-1.35	24.2	23.1	-1.91	21.1	-1.09	20.5
EAC	21.3	-2.73	18.8	17.8	-1.97	16.4	-0.83	16.2
ECCAS	28.2	-2.06	25.5	24.1	-2.15	21.1	-1.85	20.1
ECOWAS	28.2	-1.39	26.7	25.9	-1.01	25.0	0.12	25.8
IGAD	30.3	-1.47	28.0	26.8	-1.92	25.0	-0.74	24.5
SADC	23.9	-1.50	21.9	20.8	-2.04	18.5	-1.58	17.8
UMA	8.7	-0.83	8.5	5.5	-8.12	4.5	-7.19	3.6
CAADP 2009	31.9	-2.08	29.3	28.0	-1.73	26.2	-0.73	26.2
CAADP 2011	23.8	-1.55	21.8	19.8	-1.52	18.9	-0.91	18.7
CAADP 2014	26.9	-1.21	25.2	23.3	-1.88	22.5	-0.57	22.2
non-CAADP	10.8	2.16	12.0	11.0	-2.14	10.6	-0.69	10.5

Source: ReSAKSS based on World Development Indicators (World Bank 2015) and children population data (US Census Bureau 2015).

ANNEX 1d: Level 1—Agriculture's Contribution to Economic Growth and Inclusive Development, Indicator 1.2.2B

TABLE L1.2.2B—PREVALENCE OF STUNTING, HEIGHT FOR AGE (% of children under 5)								
Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	42.0	-1.10	40.2	39.1	-0.96	36.6	-1.02	35.9
Central	45.6	-1.03	44.3	43.3	-0.83	41.4	-0.40	41.0
Eastern	48.3	-1.58	45.1	43.5	-1.59	41.1	-0.40	40.9
Northern	25.8	-2.77	23.5	22.5	1.20	19.5	-4.58	17.6
Southern	43.4	-1.33	41.0	39.2	-2.42	35.2	-1.86	33.3
Western	40.9	-0.62	39.7	39.3	-0.38	36.9	-0.98	36.3
Less favorable agriculture conditions	45.4	-0.24	45.0	45.1	-0.11	45.4	0.50	46.2
More favorable agriculture conditions	48.5	-1.60	45.3	42.1	-1.60	40.6	-1.00	39.7
Mineral-rich countries	47.4	-1.12	45.7	43.8	-0.85	42.9	-0.55	42.3
Middle-income countries	35.8	-0.99	34.4	31.7	-0.71	30.4	-1.69	29.4
CEN-SAD	37.9	-0.81	36.7	36.2	-0.13	34.6	-0.66	34.3
COMESA	45.8	-1.60	42.9	41.8	-0.85	39.4	-0.92	38.6
EAC	45.5	-1.49	42.6	41.1	-1.59	39.0	-0.36	39.1
ECCAS	47.0	-1.79	44.2	42.6	-1.48	39.4	-1.03	38.5
ECOWAS	40.9	-0.62	39.7	39.3	-0.38	36.9	-0.98	36.3
IGAD	48.1	-1.59	44.5	42.9	-1.74	40.3	-0.41	39.9
SADC	45.9	-1.27	43.8	42.4	-1.52	39.5	-1.07	38.5
UMA	23.8	-1.07	22.4	17.2	-4.64	15.0	-5.22	13.0
CAADP 2009	47.1	-1.38	44.5	43.3	-1.04	40.0	-1.33	38.8
CAADP 2011	44.3	-1.13	42.3	40.1	-1.07	39.1	-0.58	38.8
CAADP 2014	43.4	-1.29	41.0	38.1	-1.77	36.9	-0.38	36.5
non-CAADP	27.8	-0.83	27.2	25.3	0.10	24.4	-2.11	23.3

Source: ReSAKSS based on World Development Indicators (World Bank 2015) and children population data (US Census Bureau 2015).

ANNEX 1e: Level 1—Agriculture’s Contribution to Economic Growth and Inclusive Development, Indicator 1.2.2C

TABLE L1.2.2C—PREVALENCE OF WASTING, WEIGHT FOR HEIGHT (% of children under 5)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	10.9	-1.26	10.2	10.0	-0.31	9.4	-0.15	9.6
Central	12.7	0.40	11.5	11.1	-1.32	9.3	-1.96	8.8
Eastern	10.5	-0.99	9.9	9.7	-1.19	9.2	-0.29	9.1
Northern	5.9	0.32	6.5	6.2	0.55	6.2	-0.66	6.2
Southern	6.5	-1.56	6.3	6.1	-2.92	5.6	0.60	5.5
Western	14.4	-2.75	13.0	12.8	0.93	12.4	0.37	13.3
Less favorable agriculture conditions	15.7	-3.84	14.0	13.1	-2.23	12.4	-0.59	12.0
More favorable agriculture conditions	9.2	-1.71	8.6	8.0	-1.50	7.7	-0.27	7.5
Mineral-rich countries	13.1	0.09	11.5	9.8	-1.73	8.8	-2.97	8.0
Middle-income countries	10.6	-0.79	10.4	10.3	1.25	10.3	0.62	11.1
CEN-SAD	12.6	-1.74	11.8	11.6	0.50	11.4	0.62	12.0
COMESA	10.2	0.00	9.8	9.7	-0.45	9.0	-0.72	8.8
EAC	6.7	-2.94	5.9	5.8	-0.01	5.6	0.66	5.6
ECCAS	11.9	-0.17	10.7	10.3	-1.30	8.7	-1.88	8.3
ECOWAS	14.4	-2.75	13.0	12.8	0.93	12.4	0.37	13.3
IGAD	11.4	-0.75	10.9	10.7	-1.27	10.1	-0.44	10.0
SADC	9.3	-0.34	8.5	8.2	-1.83	7.1	-0.97	6.8
UMA	6.3	2.24	7.2	5.5	-6.11	5.0	-1.74	4.9
CAADP 2009	13.8	-2.95	12.2	12.1	0.53	11.6	-0.21	12.2
CAADP 2011	9.8	-1.12	8.8	8.0	-1.16	7.4	-0.68	7.2
CAADP 2014	11.0	-0.11	11.0	10.7	-1.02	10.5	0.43	10.7
non-CAADP	7.2	2.14	8.2	7.9	-0.71	7.8	0.01	7.9

Source: ReSAKSS based on World Development Indicators (World Bank 2015) and children population data (US Census Bureau 2015).

ANNEX 1f: Level 1—Agriculture’s Contribution to Economic Growth and Inclusive Development, Indicator 1.3.3

TABLE L1.3.3—POVERTY GAP AT NATIONAL POVERTY LINES (%)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	15.5	-1.79	14.3	14.0	-1.46	12.5	-2.64	11.4
Central	18.6	-2.80	16.8	16.4	-0.29	14.8	-2.91	12.2
Eastern	16.8	-2.65	14.7	13.4	-3.56	10.8	-6.10	9.2
Northern	4.1	-0.54	4.0	3.9	-0.44	3.8	-0.57	3.8
Southern	24.9	-3.13	21.6	22.0	-2.77	18.7	-2.76	16.6
Western	18.7	-1.47	17.6	17.0	-1.62	15.6	-1.70	14.8
Less favorable agriculture conditions	26.3	-3.13	22.7	20.4	-4.42	15.3	-6.10	12.8
More favorable agriculture conditions	17.3	-2.46	15.4	13.4	-2.46	12.5	-3.85	11.3
Mineral-rich countries	25.8	-3.70	22.0	19.8	-1.70	18.6	-5.85	14.2
Middle-income countries	13.1	-1.08	12.5	12.1	-0.45	11.5	-1.63	11.1
CEN-SAD	14.0	-1.11	13.4	13.1	-1.01	12.3	-1.81	11.7
COMESA	12.3	-1.51	11.3	10.9	-2.14	10.3	-3.25	8.5
EAC	18.9	-4.08	15.7	13.4	-7.65	7.5	-13.32	4.8
ECCAS	22.8	-3.10	19.9	18.2	-3.75	14.7	-4.18	11.7
ECOWAS	18.7	-1.47	17.6	17.0	-1.62	15.6	-1.70	14.8
IGAD	11.8	-3.69	9.8	9.0	-4.81	6.8	-9.51	5.2
SADC	28.2	-2.07	25.6	25.3	-2.37	22.6	-1.58	21.7
UMA	6.2	-4.75	4.9	3.2	-6.89	2.5	-12.58	1.7
CAADP 2009	17.6	-2.00	16.0	15.2	-2.20	13.2	-2.88	12.2
CAADP 2011	18.5	-2.38	16.7	15.1	-2.05	14.3	-3.36	12.6
CAADP 2014	25.0	-1.61	23.5	21.4	-2.81	20.5	0.03	19.8
non-CAADP	4.1	-0.89	4.0	4.6	1.90	3.8	-3.55	3.5

Source: ReSAKSS based on World Development Indicators (World Bank 2015).

ANNEX 1g: Level 1—Agriculture's Contribution to Economic Growth and Inclusive Development, Indicator 1.3.4

TABLE L1.3.4—POVERTY HEADCOUNT RATIO AT \$1.25/DAY (PPP, % of population)								
Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	45.5	-1.34	42.9	42.0	-1.36	38.2	-1.42	36.9
Central	58.9	-3.50	52.0	51.1	-4.45	38.3	-3.84	34.6
Eastern	58.8	-2.01	53.7	51.2	-1.64	45.1	-1.51	43.6
Northern	4.4	-2.11	4.0	3.7	-3.21	3.3	-2.72	3.1
Southern	47.5	-1.47	44.0	42.4	-1.37	38.7	-1.72	37.1
Western	57.6	-1.01	55.0	53.8	-0.82	50.9	-1.21	49.3
Less favorable agriculture conditions	71.7	-3.60	62.2	57.4	-3.33	48.3	-3.25	44.4
More favorable agriculture conditions	60.1	-1.78	55.4	49.8	-1.61	47.3	-1.98	45.2
Mineral-rich countries	63.8	-0.92	60.9	59.0	-1.46	55.9	-1.59	53.3
Middle-income countries	32.7	-0.68	31.7	30.5	-0.54	29.8	-0.74	29.2
CEN-SAD	40.9	-0.65	39.7	39.2	-0.58	37.4	-0.71	36.6
COMESA	43.0	-1.32	40.7	40.6	-1.73	36.3	-1.07	35.2
EAC	61.1	-1.35	57.1	55.2	-1.34	48.8	-1.91	47.2
ECCAS	62.2	-3.51	54.7	53.2	-3.75	42.1	-3.23	38.7
ECOWAS	57.6	-1.01	55.0	53.8	-0.82	50.9	-1.21	49.3
IGAD	50.5	-2.37	45.7	42.7	-2.40	36.9	-1.66	35.2
SADC	56.1	-1.18	52.5	52.6	-1.32	46.8	-1.64	45.4
UMA	6.1	-1.10	5.7	5.3	-2.25	5.2	-1.29	5.1
CAADP 2009	60.4	-1.71	56.2	54.1	-1.30	50.0	-1.63	47.9
CAADP 2011	57.8	-1.22	54.4	50.4	-1.61	47.6	-1.79	45.7
CAADP 2014	58.9	-1.95	55.0	48.6	-1.90	45.5	-0.58	44.4
non-CAADP	8.5	-2.59	7.3	6.0	-3.89	5.4	-3.78	5.0

Source: ReSAKSS based on World Development Indicators (World Bank 2015).

ANNEX 2a: Level 2—Agricultural Transformation and Sustained Inclusive Agricultural Growth, Indicator 2.1.1

TABLE L2.1.1—AGRICULTURE VALUE-ADDED (billion, constant 2005 US\$)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	2.36	2.83	2.70	2.91	3.77	3.59	2.61	3.88
Central	1.31	-3.13	1.15	1.39	7.95	1.83	4.24	2.01
Eastern	2.05	1.67	2.15	2.38	4.61	3.35	6.63	3.88
Northern	5.21	2.43	5.72	5.79	0.09	7.17	4.70	8.00
Southern	1.38	2.10	1.53	1.63	4.80	2.10	2.80	2.32
Western	2.61	5.72	3.46	3.76	4.60	4.20	-1.48	4.15
Less favorable agriculture conditions	0.73	3.17	0.78	1.07	11.72	1.47	5.01	1.64
More favorable agriculture conditions	1.72	0.42	1.79	2.07	6.45	3.10	6.98	3.61
Mineral-rich countries	1.21	-3.64	1.04	1.11	3.86	1.39	3.17	1.50
Middle-income countries	3.50	3.99	4.21	4.39	2.57	5.10	1.10	5.35
CEN-SAD	2.94	4.35	3.55	3.82	3.66	4.49	1.22	4.70
COMESA	2.24	1.04	2.26	2.40	3.31	3.18	5.27	3.57
EAC	2.29	0.29	2.39	2.63	3.61	3.85	7.69	4.51
ECCAS	1.26	-1.47	1.21	1.48	8.19	2.10	5.62	2.42
ECOWAS	2.61	5.72	3.46	3.76	4.60	4.20	-1.48	4.15
IGAD	3.03	2.01	3.13	3.44	4.87	4.92	6.89	5.72
SADC	1.59	-0.79	1.61	1.73	4.39	2.27	3.82	2.53
UMA	4.03	1.61	4.39	4.36	-1.29	5.30	4.82	6.00
CAADP 2009	2.86	5.67	3.83	4.31	6.15	5.09	-0.52	5.15
CAADP 2011	1.62	-0.66	1.60	1.70	2.70	2.28	5.64	2.58
CAADP 2014	1.55	4.09	1.73	1.95	5.32	2.58	5.35	2.97
non-CAADP	3.56	1.99	3.85	3.89	0.76	4.67	3.40	5.08

Source: ReSAKSS based on World Development Indicators (World Bank 2015) and national sources.

ANNEX 2b: Level 2—Agricultural Transformation and Sustained Inclusive Agricultural Growth, Indicator 2.1.2

TABLE L2.1.2—AGRICULTURE PRODUCTION INDEX (API) (2004-2006=100)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	80.68	3.26	92.14	100.83	3.17	117.51	3.09	127.00
Central	88.80	1.11	93.33	100.98	3.26	119.40	3.84	131.26
Eastern	78.47	3.68	91.93	100.77	3.44	119.76	3.65	129.21
Northern	80.04	3.14	91.76	101.23	3.00	118.21	2.81	126.97
Southern	86.06	3.19	95.25	103.11	3.83	129.92	3.58	141.75
Western	79.14	3.57	91.19	99.79	2.83	110.81	2.55	119.50
Less favorable agriculture conditions	80.98	4.12	94.21	102.89	3.73	124.65	3.14	133.75
More favorable agriculture conditions	80.24	3.43	92.35	101.48	3.94	125.44	4.18	135.81
Mineral-rich countries	89.26	0.92	94.28	100.74	2.21	120.33	4.36	130.47
Middle-income countries	80.15	3.32	91.69	100.41	2.92	113.85	2.59	123.02
CEN-SAD	79.79	3.52	91.74	100.52	2.90	112.23	2.20	119.76
COMESA	82.14	3.25	92.97	101.84	3.55	117.93	2.39	124.75
EAC	78.88	3.72	93.04	100.77	3.70	121.78	4.08	132.91
ECCAS	83.52	2.46	92.65	101.74	4.02	129.48	4.93	146.58
ECOWAS	79.14	3.57	91.19	99.79	2.83	110.81	2.55	119.50
IGAD	78.40	4.05	92.34	100.88	2.95	115.94	2.69	123.51
SADC	86.09	2.26	94.20	101.99	3.78	127.00	4.13	138.86
UMA	79.27	2.81	91.56	99.22	0.94	121.62	5.27	136.77
CAADP 2009	77.12	3.89	90.76	99.99	3.24	113.91	3.07	123.62
CAADP 2011	83.75	2.77	93.34	101.21	3.34	121.72	3.91	132.24
CAADP 2014	80.64	3.59	91.80	101.09	3.17	119.57	3.43	131.14
non-CAADP	82.46	2.86	92.95	101.41	2.97	117.57	2.35	125.12

Source: ReSAKSS based on FAOStat (FAO 2015).

ANNEX 2c: Level 2—Agricultural Transformation and Sustained Inclusive Agricultural Growth, Indicator 2.1.3

TABLE L2.1.3—LABOR PRODUCTIVITY (agriculture value-added per agricultural worker, constant 2005 US\$)								
Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	699.35	0.76	739.89	755.33	1.61	832.45	0.61	857.00
Central	485.45	-4.57	396.90	456.18	5.92	545.88	2.55	577.24
Eastern	343.19	-1.14	323.14	332.67	1.86	408.79	4.55	454.89
Northern	2,285.08	1.80	2,446.96	2,447.14	-0.24	3,007.20	4.77	3,366.02
Southern	615.63	0.17	634.88	640.08	2.59	727.47	0.39	757.46
Western	947.95	4.13	1,188.99	1,239.66	2.84	1,254.74	-3.38	1,180.74
Less favorable agriculture conditions	379.89	-0.35	358.87	449.20	8.47	530.75	2.22	558.50
More favorable agriculture conditions	260.61	-2.18	242.63	261.62	3.65	341.27	4.88	382.08
Mineral-rich countries	366.82	-5.12	295.61	299.57	1.91	336.35	1.19	347.30
Middle-income countries	1,572.73	3.02	1,825.76	1,861.39	1.60	2,045.62	0.08	2,091.46
CEN-SAD	1,051.28	2.81	1,199.24	1,239.93	2.08	1,336.84	-0.41	1,343.70
COMESA	473.83	-1.41	432.82	431.02	0.78	503.20	3.31	543.58
EAC	302.61	-2.29	284.34	294.06	1.04	372.95	4.99	412.45
ECCAS	436.84	-3.66	382.56	439.60	5.83	557.65	3.52	613.33
ECOWAS	947.95	4.13	1,188.99	1,239.66	2.84	1,254.74	-3.38	1,180.74
IGAD	365.30	-0.82	336.94	345.48	2.07	426.14	4.24	468.12
SADC	449.03	-2.64	419.40	424.18	2.06	496.90	2.17	536.48
UMA	2,691.40	0.70	2,842.97	2,780.38	-1.69	3,322.86	4.58	3,743.89
CAADP 2009	656.29	3.09	802.51	849.59	3.66	884.41	-2.75	844.99
CAADP 2011	358.68	-2.64	324.94	326.54	0.47	385.58	3.15	412.90
CAADP 2014	679.15	1.96	696.29	737.15	2.97	878.84	4.12	994.90
non-CAADP	2,373.34	1.37	2,505.31	2,500.62	0.42	2,973.99	3.39	3,238.96

Source: ReSAKSS based on World Development Indicators (World Bank 2015) and FAOStat (FAO 2015).

ANNEX 2d: Level 2—Agricultural Transformation and Sustained Inclusive Agricultural Growth, Indicator 2.1.4

TABLE L2.1.4—LAND PRODUCTIVITY (agriculture value-added per hectare of arable land, constant 2005 US\$)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	595.49	2.20	658.10	684.08	2.26	783.04	0.88	812.08
Central	521.76	-3.37	449.55	538.09	7.59	671.30	2.72	713.51
Eastern	484.79	0.60	470.30	485.87	2.03	602.09	3.60	657.03
Northern	1,285.28	2.91	1,448.75	1,500.52	0.38	1,839.83	4.37	2,039.99
Southern	445.13	1.34	482.60	508.14	3.76	596.34	0.74	622.74
Western	522.58	4.95	669.69	694.10	2.85	733.60	-2.49	709.19
Less favorable agriculture conditions	230.12	1.86	234.04	306.54	9.76	378.94	2.51	402.23
More favorable agriculture conditions	426.81	-1.16	406.41	438.90	3.29	560.43	3.96	614.27
Mineral-rich countries	489.68	-4.16	403.63	417.45	2.95	472.24	0.35	477.14
Middle-income countries	771.23	3.95	918.44	938.54	1.87	1,067.98	0.51	1,105.80
CEN-SAD	642.74	3.74	750.09	780.39	2.39	871.72	-0.05	886.59
COMESA	672.07	0.00	635.26	645.68	1.45	781.69	3.35	845.30
EAC	542.84	-0.72	531.21	549.59	0.96	666.50	3.03	704.64
ECCAS	522.56	-2.06	486.93	583.17	7.34	752.25	3.04	817.27
ECOWAS	522.58	4.95	669.69	694.10	2.85	733.60	-2.49	709.19
IGAD	480.74	0.79	453.19	470.48	2.70	609.87	4.19	671.52
SADC	480.66	-1.28	473.75	492.14	2.64	571.83	1.33	602.73
UMA	939.48	2.23	1,050.50	1,065.45	-0.99	1,292.97	4.50	1,456.22
CAADP 2009	501.02	4.89	643.47	684.17	4.31	757.52	-2.02	741.05
CAADP 2011	511.87	-1.63	477.13	481.51	0.18	560.42	2.71	592.22
CAADP 2014	462.44	3.22	484.46	528.62	4.06	643.22	3.23	713.96
non-CAADP	996.43	2.28	1,101.20	1,141.79	1.19	1,389.78	3.67	1,520.35

Source: ReSAKSS based on World Development Indicators (World Bank 2015) and FAOStat (FAO 2015).

ANNEX 2e: Level 2—Agricultural Transformation and Sustained Inclusive Agricultural Growth, Indicator 2.1.5

TABLE L2.1.5—CEREAL YIELD (kilograms per hectare)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	1,261.01	1.39	1,341.04	1,385.57	1.56	1,540.08	1.60	1,620.75
Central	893.91	1.39	942.21	980.03	1.45	1,062.82	0.97	1,119.15
Eastern	1,060.07	1.09	1,130.22	1,171.69	3.86	1,403.67	4.93	1,517.34
Northern	2,365.97	2.82	2,690.26	2,667.29	0.14	2,880.43	0.74	3,097.05
Southern	1,531.38	2.25	1,545.68	1,587.28	2.24	1,909.76	1.44	1,946.57
Western	1,005.05	0.81	1,051.16	1,141.65	2.48	1,208.09	-0.07	1,265.74
Less favorable agriculture conditions	562.28	2.53	585.23	654.72	3.85	783.70	1.70	815.38
More favorable agriculture conditions	1,232.79	0.35	1,228.11	1,290.58	3.40	1,531.74	4.62	1,679.45
Mineral-rich countries	1,115.34	0.12	1,135.20	1,215.10	2.30	1,415.37	2.88	1,449.32
Middle-income countries	1,482.09	2.29	1,661.26	1,693.45	0.94	1,846.71	0.19	1,885.43
CEN-SAD	1,207.56	1.41	1,317.63	1,353.57	0.54	1,420.14	0.58	1,481.47
COMESA	1,553.98	1.37	1,641.84	1,689.53	2.15	1,898.59	3.55	1,984.07
EAC	1,474.86	-0.29	1,441.40	1,395.05	3.59	1,534.91	2.54	1,621.61
ECCAS	852.98	1.15	877.47	903.38	1.50	1,023.74	2.06	1,104.51
ECOWAS	1,005.05	0.81	1,051.16	1,141.65	2.48	1,208.09	-0.07	1,265.74
IGAD	933.65	1.70	1,010.24	1,068.02	2.93	1,308.43	6.74	1,467.10
SADC	1,476.07	1.19	1,468.31	1,494.48	3.27	1,729.34	0.74	1,731.85
UMA	997.06	3.18	1,295.55	1,217.26	-7.27	1,478.86	5.30	1,755.29
CAADP 2009	1,027.47	0.56	1,064.31	1,169.53	3.65	1,334.80	1.67	1,445.32
CAADP 2011	1,191.52	0.63	1,202.36	1,236.14	2.60	1,393.83	3.11	1,474.20
CAADP 2014	805.69	1.36	854.91	876.72	0.09	919.51	2.29	935.99
non-CAADP	2,233.68	3.57	2,543.98	2,630.91	2.04	2,957.51	-0.10	3,089.03

Source: ReSAKSS based on FAOStat (FAO 2015).

ANNEX 3a: Level 3—Strengthening Systemic Capacity to Deliver Results, Indicator 3.5.1

TABLE L3.5.1—PUBLIC AGRICULTURE EXPENDITURE (million, constant 2005 US\$)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	128.55	6.07	159.42	186.47	6.60	219.62	2.32	238.99
Central	20.76	-0.01	21.02	27.46	9.89	62.99	19.79	93.28
Eastern	77.98	3.39	103.84	126.27	6.53	135.35	-1.96	127.95
Northern	557.78	5.98	652.22	626.14	-1.36	689.53	4.67	791.42
Southern	128.75	11.75	187.00	261.39	13.14	324.03	1.41	348.05
Western	71.37	4.82	83.97	113.32	14.07	135.24	-0.31	138.84
Less favorable agriculture conditions	40.62	2.63	48.22	57.05	3.37	61.40	6.11	70.31
More favorable agriculture conditions	72.10	1.96	89.16	109.91	8.68	154.56	3.00	173.12
Mineral-rich countries	27.52	1.86	26.07	40.95	19.82	89.55	12.55	128.45
Middle-income countries	213.95	7.57	269.50	309.10	5.87	340.93	1.21	358.74
CEN-SAD	149.96	3.14	162.09	171.25	3.30	170.82	-0.33	173.25
COMESA	127.75	2.43	135.65	150.40	4.57	167.38	2.61	186.03
EAC	66.91	5.22	88.35	84.79	-1.57	131.85	5.83	142.96
ECCAS	24.85	0.59	25.48	50.47	26.55	92.71	9.82	123.69
ECOWAS	71.37	4.82	83.97	113.32	14.07	135.24	-0.31	138.84
IGAD	104.16	3.71	142.05	180.86	8.23	169.00	-2.70	156.18
SADC	103.35	8.77	141.38	190.36	11.49	249.93	2.04	272.02
UMA	422.21	7.09	550.28	561.39	1.14	678.19	5.01	777.34
CAADP 2009	66.68	12.39	96.48	135.07	14.63	146.91	-2.55	144.55
CAADP 2011	62.71	-0.58	67.19	79.52	7.87	134.39	9.55	172.37
CAADP 2014	49.55	-1.99	57.72	95.89	19.60	97.05	-5.99	88.89
non-CAADP	412.89	7.93	516.02	541.45	1.91	598.74	2.81	643.92

Source: ReSAKSS based on SPEED Database (IFPRI 2015), AUC 2008, World Development Indicators (World Bank 2015), and national sources.

ANNEX 3b: Level 3—Strengthening Systemic Capacity to Deliver Results, Indicator 3.5.2

TABLE L3.5.2—SHARE OF AGRICULTURE EXPENDITURE IN TOTAL PUBLIC EXPENDITURE (%)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	3.31	2.99	3.63	3.54	-2.04	2.97	-1.38	2.93
Central	2.54	1.48	2.32	2.65	4.42	3.74	6.29	4.23
Eastern	5.65	-0.51	6.00	6.23	-0.44	5.26	-6.05	4.44
Northern	4.45	1.39	4.32	3.64	-8.60	2.71	0.67	2.88
Southern	1.68	10.30	2.32	2.54	2.46	2.18	-3.35	2.04
Western	4.05	-3.61	3.84	4.25	4.86	4.50	2.16	4.61
Less favorable agriculture conditions	8.49	-2.40	8.46	8.90	-1.22	7.05	-1.14	6.83
More favorable agriculture conditions	6.77	-3.47	6.65	7.23	3.08	7.23	-4.45	6.75
Mineral-rich countries	4.66	6.93	3.93	4.60	10.82	5.71	0.04	6.19
Middle-income countries	2.89	4.42	3.26	3.11	-3.05	2.46	-1.79	2.38
CEN-SAD	4.99	-1.82	4.51	3.96	-5.14	2.98	-1.99	2.84
COMESA	5.62	1.13	5.25	4.79	-4.09	3.67	-2.01	3.59
EAC	4.79	0.14	5.05	4.40	-6.78	4.56	-2.68	4.07
ECCAS	1.70	-2.73	1.47	2.13	12.32	2.32	-2.84	2.12
ECOWAS	4.05	-3.61	3.84	4.25	4.86	4.50	2.16	4.61
IGAD	6.01	-0.02	6.47	6.91	0.48	5.21	-5.68	4.45
SADC	1.91	8.39	2.50	2.66	1.28	2.38	-3.33	2.22
UMA	3.84	1.77	4.02	3.68	-5.30	3.06	0.70	3.27
CAADP 2009	3.66	0.89	4.20	4.84	5.12	4.70	0.41	4.69
CAADP 2011	5.33	-1.42	5.11	5.15	1.64	5.74	0.53	6.02
CAADP 2014	2.44	-2.51	2.65	3.34	6.35	2.42	-12.51	1.68
non-CAADP	3.05	5.24	3.42	3.04	-6.18	2.33	-0.69	2.33

Source: ReSAKSS based on SPEED Database (IFPRI 2015), AUC 2008, World Development Indicators (World Bank 2015), and national sources.

ANNEX 3c: Level 3—Strengthening Systemic Capacity to Deliver Results, Indicator 3.5.3

TABLE L3.5.3—PUBLIC AGRICULTURE EXPENDITURE AS SHARE OF AGRICULTURE GDP (%)

Region	Annual avg. level (1995–2003)	Annual avg. percentage change (1995–2003)	2003	Annual avg. level (2003–2008)	Annual avg. percentage change (2003–2008)	Annual avg. level (2008–2014)	Annual avg. percentage change (2008–2014)	2014
Africa	5.14	3.95	5.67	6.11	2.56	5.79	-0.66	5.76
Central	1.82	3.83	2.11	2.10	-1.05	3.14	11.22	3.87
Eastern	3.03	6.88	4.42	4.89	1.83	3.78	-8.66	2.95
Northern	9.50	3.08	9.98	9.35	-1.67	8.20	-0.58	8.33
Southern	9.25	9.45	12.20	15.88	7.96	15.45	-1.35	15.01
Western	2.78	-0.84	2.43	2.99	9.06	3.22	1.19	3.34
Less favorable agriculture conditions	5.01	-0.51	5.55	4.93	-7.64	3.71	0.97	3.79
More favorable agriculture conditions	4.19	1.56	4.98	5.29	2.09	5.00	-4.36	4.65
Mineral-rich countries	2.23	7.07	2.49	3.61	15.37	6.07	6.47	7.47
Middle-income countries	5.66	4.14	6.03	6.58	3.01	6.23	-0.02	6.23
CEN-SAD	4.71	-0.25	4.29	4.20	-0.47	3.55	-1.70	3.42
COMESA	4.97	4.02	5.56	5.76	0.94	4.73	-3.87	4.42
EAC	2.93	4.92	3.69	3.24	-5.00	3.44	-1.73	3.17
ECCAS	2.15	2.57	2.29	3.29	13.91	4.09	2.51	4.49
ECOWAS	2.78	-0.84	2.43	2.99	9.06	3.22	1.19	3.34
IGAD	2.79	9.29	4.51	5.24	3.20	3.52	-8.97	2.73
SADC	6.47	10.51	8.77	10.94	6.80	10.83	-2.87	10.07
UMA	9.30	4.84	10.85	10.95	2.19	10.62	-0.71	10.56
CAADP 2009	2.32	6.36	2.51	3.10	7.99	2.89	-2.04	2.81
CAADP 2011	3.81	0.77	4.20	4.67	5.03	5.78	3.13	6.43
CAADP 2014	2.46	2.06	3.29	4.64	12.12	3.65	-11.15	2.80
non-CAADP	9.98	5.54	11.43	11.78	0.95	10.74	-1.00	10.50

Source: ReSAKSS based on SPEED Database (IFPRI 2015), AUC 2008, World Development Indicators (World Bank 2015), and national sources.

ANNEX 3d: Level 3—Strengthening Systemic Capacity to Deliver Results, Indicator 3.1.1

TABLE L 3.1.1—PROGRESS IN CAADP IMPLEMENTATION PROCESS AS OF JULY 2015								
Country/region	Roundtable held and compact signed	Investment plan drafted, reviewed, and validated	Business meeting held	Country SAKSS established	GAFSP funding approved (million US\$)	Grow Africa first wave	JSR assessment conducted	New Alliance Cooperation Framework launched
AFRICA*	42	30	26	9	17	12	18	10
Central Africa*	9	5	3	1	1		2	
Burundi	August 25, 2009	August 31, 2011	March 15, 2012		Burundi (\$30)		yes ⁺	
Cameroon	July 17, 2013	August 22, 2014						
Central African Republic	April 15, 2011	May 21, 2012	December 21, 2013					
Chad	December 16, 2013							
Congo, Dem. Republic	March 18, 2011	May 21, 2013	November 8, 2013	yes			yes ⁺⁺	
Congo, Republic	December 10, 2013							
Equatorial Guinea	December 5, 2013							
Gabon	May 10, 2013							
São Tomé and Príncipe	October 17, 2013	September 2, 2014						
Eastern Africa*	10	6	5	4	4	4	4	2
Comoros, The								
Djibouti	April 19, 2012	November 22, 2012						
Eritrea								
Ethiopia	September 28, 2009	September 25, 2010	December 7, 2010	yes	Ethiopia (\$51.5)	Ethiopia	yes	yes
Kenya	July 24, 2010	September 14, 2010	September 27, 2010		Kenya (\$24)	Kenya	yes ⁺	
Madagascar	October 21, 2013							
Mauritius	July 23, 2015							
Rwanda	March 31, 2007	December 8, 2009	December 9, 2009	yes	Rwanda (\$50)	Rwanda		
Seychelles	September 16, 2011							
Somalia								
Sudan	July 29, 2013							
Tanzania	July 8, 2010	May 31, 2011	November 10, 2011	yes	Tanzania (\$22.9)	Tanzania	yes	yes
Uganda	March 31, 2010	September 10, 2010	September 17, 2010	yes	Uganda (\$27.6)		yes ⁺⁺	

ANNEX 3d: Level 3—Strengthening Systemic Capacity to Deliver Results, Indicator 3.1.1 *continued*

TABLE L 3.1.1—PROGRESS IN CAADP IMPLEMENTATION PROCESS AS OF JULY 2015 <i>continued</i>								
Country/region	Roundtable held and compact signed	Investment plan drafted, reviewed, and validated	Business meeting held	Country SAKSS established	GAFSP funding approved (million US\$)	Grow Africa first wave	JSR assessment conducted	New Alliance Cooperation Framework launched
Northern Africa*	1	1	1					
Algeria								
Egypt								
Libya								
Mauritania	July 28, 2011	February 16, 2012	March 21, 2012					
Morocco								
Tunisia								
Southern Africa*	7	3	3	1	2	2	4	2
Angola	August 5, 2014							
Botswana								
Lesotho	September 4, 2013							
Malawi	April 19, 2010	September 16, 2010	September 29, 2011		Malawi (\$39.6)	Malawi	yes	yes
Mozambique	December 9, 2011	December 13, 2012	April 12, 2013	yes		Mozambique	yes	yes
Namibia								
South Africa								
Swaziland	March 4, 2010						yes ⁺⁺	
Zambia	January 18, 2011	March 15, 2013	May 30, 2013		Zambia (\$31.1)		yes ⁺⁺	
Zimbabwe	November 22, 2013							
Western Africa*	15	15	14	3	8	6	8	6
Benin	October 16, 2009	September 25, 2010	June 7, 2011	yes	Benin (\$24)	Benin	yes ⁺	yes
Burkina Faso	July 22, 2010	January 17, 2012	March 26, 2012		Burkina Faso (\$37.1)	Burkina Faso	yes	yes
Cape Verde	December 11, 2009	September 25, 2010	November 17, 2010					
Côte d'Ivoire	July 27, 2010	June 20, 2012	September 14, 2012			Côte d'Ivoire	yes ⁺	yes
Gambia, The	October 28, 2009	September 25, 2010	November 5, 2010		Gambia, The (\$28)			
Ghana	October 28, 2009	June 9, 2010	June 17, 2010	yes		Ghana	yes	yes
Guinea	April 7, 2010	September 25, 2010	June 5, 2013					
Guinea Bissau	January 18, 2011	June 3, 2011						

ANNEX 3d: Level 3—Strengthening Systemic Capacity to Deliver Results, Indicator 3.1.1 *continued*

TABLE L 3.1.1—PROGRESS IN CAADP IMPLEMENTATION PROCESS AS OF JULY 2015 *continued*

Country/region	Roundtable held and compact signed	Investment plan drafted, reviewed, and validated	Business meeting held	Country SAKSS established	GAFSP funding approved (million US\$)	Grow Africa first wave	JSR assessment conducted	New Alliance Cooperation Framework launched
Western Africa* cont'd	15	15	13	2	8	2	3	6
Liberia	October 6, 2009	June 9, 2010	June 17, 2010		Liberia (\$46.5)			
Mali	October 13, 2009	September 25, 2010	November 5, 2010		Mali (\$37.2)		yes ⁺	
Niger	September 30, 2009	September 25, 2010	December 15, 2010		Niger (\$33)		yes ⁺	
Nigeria	October 30, 2009	June 9, 2010	June 17, 2010			Nigeria		yes
Senegal	February 10, 2010	June 9, 2010	June 17, 2010		Senegal (\$40)	Senegal	yes	yes
Sierra Leone	September 18, 2009	June 9, 2010	June 17, 2010		Sierra Leone (\$50)			
Togo	July 30, 2009	June 9, 2010	June 17, 2010	yes	Togo (\$39)		yes ⁺	
RECS**	4	2	1					
CEN-SAD								
COMESA	November 14, 2014							
EAC	In progress							
ECCAS	July 10, 2013	September 5, 2013						
ECOWAS	November 12, 2009	June 9, 2010	June 17, 2010					
IGAD	October 30, 2013							
SADC	In progress							
UMA								

Sources: Authors' compilation based on African Union Commission (March 2014) and ReSAKSS (2015).

Notes. * The items in this row are the number of countries in Africa or the subregion that have achieved the milestone.

** The items in this row are the number of RECs that have achieved the milestone.

⁺ The countries in this row have undertaken JSR assessment in 2015 and the reports are being finalized.

⁺⁺ The countries in this row have undertaken JSR assessment in 2015 and the reports are completed.

SAKSS=Strategic Analysis and Knowledge Support System; GAFSP=Global Agriculture and Food Security Program; JSR=Joint Sector Review; New Alliance=New Alliance for Food Security and Nutrition.

ReSAKSS-ECA		ReSAKSS-SA	ReSAKSS-WA
Burundi (COMESA, EAC, ECCAS)	Gabon (ECCAS)	Angola (ECCAS, SADC)	Benin (CEN-SAD, ECOWAS)
Central African Rep. (Cen-SAD, ECCAS)	Kenya (Cen-SAD, COMESA, EAC, IGAD)	Botswana (SADC)	Burkina Faso (CEN-SAD, ECOWAS)
Comoros (CEN-SAD, COMESA)	Libya (CEN-SAD, COMESA, UMA)	Lesotho (SADC)	Cameroon (ECCAS)
Congo, D.R. (COMESA, ECCAS, SADC)	Rwanda (COMESA, EAC, ECCAS)	Madagascar (COMESA, SADC)	Cape Verde (ECOWAS)
Congo, R. (ECCAS)	Seychelles (COMESA, SADC)	Malawi (COMESA, SADC)	Chad (CEN-SAD, ECCAS)
Djibouti (CEN-SAD, COMESA, IGAD)	South Sudan (IGAD)	Mauritius (COMESA, SADC)	Côte d'Ivoire (CEN-SAD, ECOWAS)
Egypt (CEN-SAD, COMESA)	Sudan (CEN-SAD, COMESA, IGAD)	Mozambique (SADC)	Gambia (CEN-SAD, ECOWAS)
Eritrea (COMESA, IGAD)	Tanzania (SADC)	Namibia (SADC)	Ghana (CEN-SAD, ECOWAS)
Ethiopia (COMESA, IGAD)	Uganda (COMESA, EAC, IGAD)	Swaziland (COMESA, SADC)	Guinea (CEN-SAD, ECOWAS)
		Zambia (COMESA, SADC)	Guinea-Bissau (CEN-SAD, ECOWAS)
		Zimbabwe (COMESA, SADC)	Liberia (CEN-SAD, ECOWAS)
			Mali (CEN-SAD, ECOWAS)
			Mauritania (CEN-SAD, UMA)
			Niger (CEN-SAD, ECOWAS)
			Nigeria (CEN-SAD, ECOWAS)
			Senegal (CEN-SAD, ECOWAS)
			Sierra Leone (CEN-SAD, ECOWAS)
			Togo (CEN-SAD, ECOWAS)

ANNEX 4a: Supplementary Data Tables

TABLE A1—SECTORAL CONTRIBUTIONS TO PRODUCTIVITY GROWTH IN THE TOTAL ECONOMY, 2000–2010 (%)

Sector categories	Agriculture	Mining	Manufacturing	Utilities	Construction	Trade services	Transport services	Business services	Government services	Personal services	Total economy
From within-sector productivity growth—Channel B											
Botswana	1.5	39.7	3.5	1.2	25.6	-4.5	2.4	-0.1	14.3	23.9	107.5
Ethiopia	38.4	-0.1	-2.7	0.4	-4.8	-1.0	3.7	-2.5	12.7	2.6	46.7
Ghana	44.8	6.6	1.6	1.4	14.0	-1.2	8.0	-4.6	3.5	-1.3	72.9
Kenya	21.4	-0.5	-27.2	15.5	-2.1	-10.9	92.4	44.5	0.9	-13.1	121.0
Malawi	32.8	4.1	-7.1	-1.3	-7.2	-25.4	-10.8	13.5	-26.2	-10.7	-38.1
Mauritius	9.9	1.1	29.2	0.8	7.4	4.6	14.7	-10.5	7.7	5.3	70.1
Nigeria	68.1	14.7	8.6	0.0	-0.3	12.0	-0.2	-12.0	-0.4	0.4	90.8
Senegal	11.0	-5.0	-26.9	39.2	0.2	-26.9	19.9	-22.1	-1.1	2.9	-8.8
South Africa	3.7	12.8	17.5	2.1	3.5	15.9	14.1	8.2	1.8	4.7	84.2
Tanzania	22.7	9.5	1.3	-4.2	-6.2	-1.0	3.3	12.8	-2.2	-0.1	36.1
Zambia	-5.8	0.6	-0.8	4.9	34.4	-24.9	13.3	6.1	3.5	2.6	34.0
From sector labor mobility (structural change)—Channel C											
Botswana	-0.2	-23.7	1.6	-0.7	-18.4	26.9	3.2	17.2	-4.8	-8.7	-7.5
Ethiopia	-9.7	0.6	7.0	0.9	12.9	22.3	3.2	19.1	-2.2	-0.7	53.3
Ghana	-26.8	-3.6	0.6	0.8	2.9	13.4	11.6	14.3	7.9	6.0	27.1
Kenya	-52.4	1.5	40.6	-9.8	11.7	51.9	-9.0	-47.7	-20.3	12.5	-21.0
Malawi	-29.0	6.0	18.7	4.3	16.3	54.5	31.2	2.6	17.7	15.9	138.1
Mauritius	-6.5	0.8	-20.4	1.4	1.3	10.7	6.9	30.4	5.0	0.3	29.9
Nigeria	-32.9	-24.8	-2.7	0.2	4.0	34.3	6.5	21.1	1.5	2.0	9.2
Senegal	-18.0	5.1	28.7	-27.1	11.4	27.1	42.2	36.5	4.6	-1.6	108.8
South Africa	-1.6	-13.7	-4.6	-0.3	3.2	-0.9	0.5	27.0	5.4	0.7	15.8
Tanzania	-9.7	-3.6	9.7	6.8	20.2	17.6	6.2	-0.5	17.1	0.2	63.9
Zambia	0.6	7.1	6.9	-4.2	4.0	37.6	0.6	2.7	12.1	-1.2	66.0
From each sector's total—Channels B + C											
Botswana	1.4	15.9	5.1	0.5	7.3	22.4	5.6	17.1	9.4	15.2	100
Ethiopia	28.6	0.5	4.3	1.3	8.1	21.3	6.9	16.6	10.5	1.8	100
Ghana	18.0	3.0	2.2	2.2	16.9	12.1	19.6	9.8	11.4	4.8	100
Kenya	-31.0	1.0	13.4	5.7	9.6	41.0	83.4	-3.1	-19.5	-0.5	100
Malawi	3.9	10.1	11.6	3.0	9.1	29.0	20.4	16.2	-8.5	5.2	100
Mauritius	3.4	1.8	8.8	2.2	8.7	15.2	21.6	19.8	12.8	5.6	100
Nigeria	35.2	-10.1	5.9	0.2	3.7	46.3	6.3	9.1	1.0	2.3	100
Senegal	-7.0	0.1	1.8	12.1	11.5	0.3	62.1	14.4	3.5	1.3	100
South Africa	2.2	-0.9	12.9	1.7	6.8	15.0	14.6	35.2	7.2	5.4	100
Tanzania	13.0	6.0	11.0	2.6	14.0	16.6	9.5	12.3	14.9	0.0	100
Zambia	-5.3	7.8	6.0	0.7	38.4	12.7	13.9	8.8	15.6	1.3	100

Source: Authors' calculations using demographic and health survey (DHS) data.

Notes: 1. Sample includes all African countries in DHS (excludes D. R. Congo). 2. Numbers shown are for a subsample of people who reported to be currently working and not attending school. 3. Average I is the average for countries that have data for both genders for all three periods. 4. Average II is the column average for all countries.

ANNEX 4a: Supplementary Data Tables

TABLE A2—PERCENTAGE OF WORKERS (age 25+) IN AGRICULTURE, DHS AFRICA SAMPLE

Country name	Female			Male			Combined		
	1990s	2000-2005	2006-2012	1990s	2000-2005	2006-2012	1990s	2000-2005	2006-2012
Benin	29.6	34.7	38.4	67.1	61.4	55.4	48.3	48.1	46.9
Burkina Faso	32.4	76.6	60.4	77.7	76.2		55.0	76.4	30.2
Cameroon	62.0	53.6	40.9	54.2	47.5		58.1	50.5	20.5
Chad	47.4	75.4		79.1	71.8		63.3	73.6	
Côte d'Ivoire	49.8	44.4	35.9	51.6		51.7	50.7		43.8
Ethiopia		57.9	46.9		84.5	74.8		71.2	60.9
Gabon		23.5	9.7		19.2	7.4		21.4	8.5
Ghana	41.4	39.7	32.9	55.4	52.2	44.4	48.4	46.0	38.7
Guinea	64.4	60.3		62.3	60.7		63.4	60.5	
Kenya	48.2	53.6	42.3	44.3	44.1	36.1	46.2	48.8	39.2
Lesotho		35.2	22.3		30.1	43.0		32.7	32.6
Madagascar	63.6	69.5	71.6		66.8	73.9		68.2	72.8
Malawi	23.8	67.6	55.9	60.0	57.0	46.8	41.9	62.3	51.4
Mali	40.1	45.1	0.0	64.8	66.2	56.1	52.5	55.6	28.0
Mozambique	78.0	80.9	66.8	56.2	65.2	45.2	67.1	73.0	56.0
Namibia	1.9	11.1	16.9		17.0			14.1	8.4
Niger	34.8		38.1	76.1		51.6	55.4		44.8
Nigeria	21.7	20.8	24.0	43.2	39.2	39.9	32.5	30.0	32.0
Rwanda	94.5	89.6	84.4	88.8	68.6	68.8	91.7	79.1	76.6
Senegal	37.4	25.4	20.6	43.1	29.7	25.7	40.3	27.6	23.2
Tanzania	78.5	78.8	69.9	72.1	70.5	61.3	75.3	74.7	65.6
Uganda	73.3	77.6	71.0	71.6	66.9	63.2	72.5	72.3	67.1
Zambia	56.0	63.0	47.7	49.1	58.1	50.4	52.5	60.5	49.1
Zimbabwe	40.9		32.6	26.2		32.9	33.5		32.8
Average I	51.9	56.4	46.2	59.6	56.6	50.0	55.8	56.5	47.7
Average II	49.1	53.8	42.2	60.2	54.9	49.3	54.6	54.6	49.3

Source: Authors' calculations using demographic and health survey (DHS) data.

Notes: 1. Sample includes all African countries in DHS (excludes D. R. Congo). 2. Numbers shown are for a subsample of people who reported to be currently working and not attending school. 3. Average I is the average for countries that have data for both genders for all three periods. 4. Average II is the column average for all countries.

ANNEX 4a: Supplementary Data Tables

TABLE A3—GROWTH RATE IN PER CAPITA GDP AND SHARE OF NONMANUFACTURING INDUSTRY AND SERVICES IN GDP (%)										
Country categories	Growth rate per capita						Share of GDP in current prices			
	GDP	AgrGDP	MfgGDP	MiningGDP	IndGDP	SersGDP	Mining		Services	
							2000	2012	2000	2012
Best-growth performers										
Angola	8.0	8.4	11.7	5.5	6.5	8.6	67.0	49.2	21.4	27.5
Ethiopia	6.4	4.5	5.7	7.6	7.6	7.1	2.6	2.5	39.8	10.0
Nigeria	6.2	6.0	6.0	-0.3	0.5	9.4	47.9	37.4	21.8	26.3
Good-growth performers										
Rwanda	5.4	2.2	4.6	-1.8	6.8	7.9	1.0	1.2	45.6	48.0
Mozambique	4.8	4.7	3.9	4.1	4.8	5.2	3.3	6.0	52.3	47.6
Sierra Leone	4.8	5.5	2.2	1.2	7.1	2.4	3.8	23.3	42.2	36.0
Chad	4.4	0.4	1.5	-4.4	11.3	4.0	0.6	44.1	46.4	29.0
Tanzania	4.0	1.3	5.6	5.3	6.0	4.8	4.2	6.1	47.9	47.6
Ghana	3.8	1.8	1.6	8.9	6.1	4.3	4.6	10.0	48.1	50.0
Uganda	3.6	-1.3	2.9	1.4	4.8	4.5	3.8	4.2	49.1	49.7
Other fast-growth countries										
Namibia	3.3	-2.2	3.7	1.5	3.3	3.9	12.7	14.9	60.9	61.2
Lesotho	3.3	-0.6	3.7	6.8	4.5	3.2	5.0	12.3	57.7	58.3
Burundi	3.2	1.3	-0.3	10.1	1.6	6.1	1.1	2.0	40.7	39.5
Botswana	3.1	2.6	4.3	-4.6	-1.2	5.7	38.9	21.0	46.4	62.2
Zambia	3.0	0.3	1.6	5.0	6.0	2.6	7.8	5.2	55.2	42.6
Burkina Faso	2.8	5.2	-0.9	9.7	3.2	4.7	1.8	8.7	45.6	43.6
Congo, Dem. Rep.	2.7	-0.1	1.5	6.3	5.2	4.0	11.1	13.3	30.2	32.6

ANNEX 4a: Supplementary Data Tables

TABLE A3—GROWTH RATE IN PER CAPITA GDP AND SHARE OF NONMANUFACTURING INDUSTRY AND SERVICES IN GDP (%) <i>continued</i>										
Country categories	Growth rate per capita						Share of GDP in current prices			
	GDP	AgrGDP	MfgGDP	MiningGDP	IndGDP	SersGDP	Mining		Services	
							2000	2012	2000	2012
Slow-growth countries										
Benin	0.6	0.3	-1.0	-0.9	0.2	1.2	1.1	1.4	48.2	50.2
Cameroon	0.7	1.4	-0.8	-7.0	-2.2	3.2	12.4	8.8	42.3	47.6
Central African Republic	-0.1	-0.1	1.2	-1.6	0.4	-0.7	5.0	2.8	33.3	32.0
Congo, Rep.	2.0	1.9	6.1	0.1	0.7	3.1	67.8	70.5	20.7	0.0
Côte d'Ivoire	-0.5	-0.7	-3.6	2.5	-3.6	-2.2	1.9	5.2	47.8	0.0
Eritrea	-2.8	-0.2	-8.3	26.7	-1.8	-3.9	1.3	1.7	61.9	0.0
Gabon	-0.1	0.7	6.9	-2.6	-1.5	1.2	54.0	62.4	36.0	26.9
Gambia, The	0.2	-1.4	-0.5	8.5	0.2	-0.4	1.2	4.4	61.7	61.8
Guinea	0.1	-1.8	0.8	0.4	0.5	0.9	18.5	19.4	44.6	41.0
Kenya	1.7	-0.7	1.4	2.5	1.9	1.9	2.7	2.3	49.9	53.2
Liberia	0.3	-2.7	8.2	43.8	12.5	1.3	0.2	3.0	28.8	17.9
Madagascar	0.1	-0.7	-0.5	-4.8	1.2	0.4	1.9	1.9	55.2	51.2
Malawi	1.5	-4.0	10.8	23.2	8.7	0.0	2.3	2.4	45.0	51.9
Mali	1.6	2.6	-2.7	0.9	-0.7	1.8	8.0	11.0	42.9	35.8
Mauritania	2.3	-0.7	-5.4	4.7	2.3	4.6	12.9	23.4	36.7	38.9
Senegal	1.2	-0.3	-0.3	0.7	0.7	2.0	3.9	4.8	57.6	58.7
Sudan	1.4	1.3	3.1	-5.1	2.3	1.8	8.1	2.5	45.6	41.6
Swaziland	1.0	-0.3	-0.7	-15.8	-0.7	2.9	1.4	1.4	44.9	47.2
Togo	0.1	-1.1	0.6	-4.6	0.4	0.4	7.4	7.8	42.4	35.7
Zimbabwe	-0.7	-4.8	-0.9	1.3	0.6	-1.2	3.4	15.8	58.3	48.1

Source: Diao and McMillan (2014), based on data from UNSD.

Notes: Agr = agriculture; Mfg = manufacturing; Ind = industry; Sers = services. The 17 fast-growth African countries are ranked according to growth rate in gross domestic product (GDP) per capita. Guinea-Bissau and Niger are in the slow-growth group, and are excluded from this table due to unavailable sector data. The mining GDP includes the utility subsector, as the data are reported in that way.

ANNEX 4a: Supplementary Data Tables

TABLE A4—GROWTH IN TRADE AT CURRENT AND CONSTANT PRICES FOR THE 17 FAST-GROWTH AFRICAN COUNTRIES (2000–2012 annual average, %) AND SHARE OF NET EXPORTS IN GDP (2000 and 2012, %)									
Country categories	Growth rate							Share of net exports in GDP, current price	
	GDP pc	GDP		Total exports		Total imports		2000	2012
	Constant price	Current price	Constant price	Current price	Constant price	Current price	Constant price		
Best-growth performers									
Angola	8.0	27.3	11.7	24.3	41.5	22.4	39.3	27.6	17.6
Ethiopia	6.4	16.2	9.4	17.1	10.2	18.8	11.8	-12.2	-18.1
Nigeria	6.2	17.5	8.2	18.3	na	18.6	na	32.1	32.6
Good-growth performers									
Rwanda	5.4	14.7	8.1	20.7	13.4	18.1	12.9	-18.2	-20.4
Mozambique	4.8	11.4	7.7	14.7	13.7	15.2	8.3	-20.5	-40.5
Sierra Leone	4.8	11.1	8.1	15.9	10.5	13.7	10.2	-15.7	-37.4
Chad	4.4	18.9	8.0	30.8	42.5	17.7	5.2	-17.8	-12.1
Tanzania	4.0	9.3	7.0	16.1	13.3	18.4	17.1	-6.8	-17.8
Ghana	3.8	15.5	6.5	19.1	na	18.6	na	-11.5	-10.4
Uganda	3.6	12.1	7.2	20.3	14.0	17.1	10.8	-11.6	-14.4
Other fast-growth countries									
Namibia	3.3	12.0	4.8	13.0	5.0	13.9	8.0	-3.7	-10.1
Lesotho	3.3	12.0	4.1	11.1	7.3	9.3	3.9	-99.9	-61.6
Burundi	3.2	13.9	6.7	15.9	10.2	20.7	19.5	-12.5	-31.2
Botswana	3.1	9.0	4.2	6.9	1.0	11.6	5.7	11.7	-5.5
Zambia	3.0	18.7	5.9	24.2	10.3	17.2	9.3	-13.9	3.1
Burkina Faso	2.8	13.1	5.8	22.4	15.5	15.8	9.3	-16.0	-6.8
Congo, Dem. Rep.	2.7	11.7	5.7	25.8	5.2	27.4	7.0	1.4	-10.8

Source: Diao and McMillan (2014), based on data from UNSD and World Bank.

Notes: GDP = gross domestic product; pc = per capita; na = not available. Given that for two countries trade data in constant value are not available, we report trade growth rate in both current and constant prices. For the purpose of comparison, we also report growth rate in GDP in current and constant prices.

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