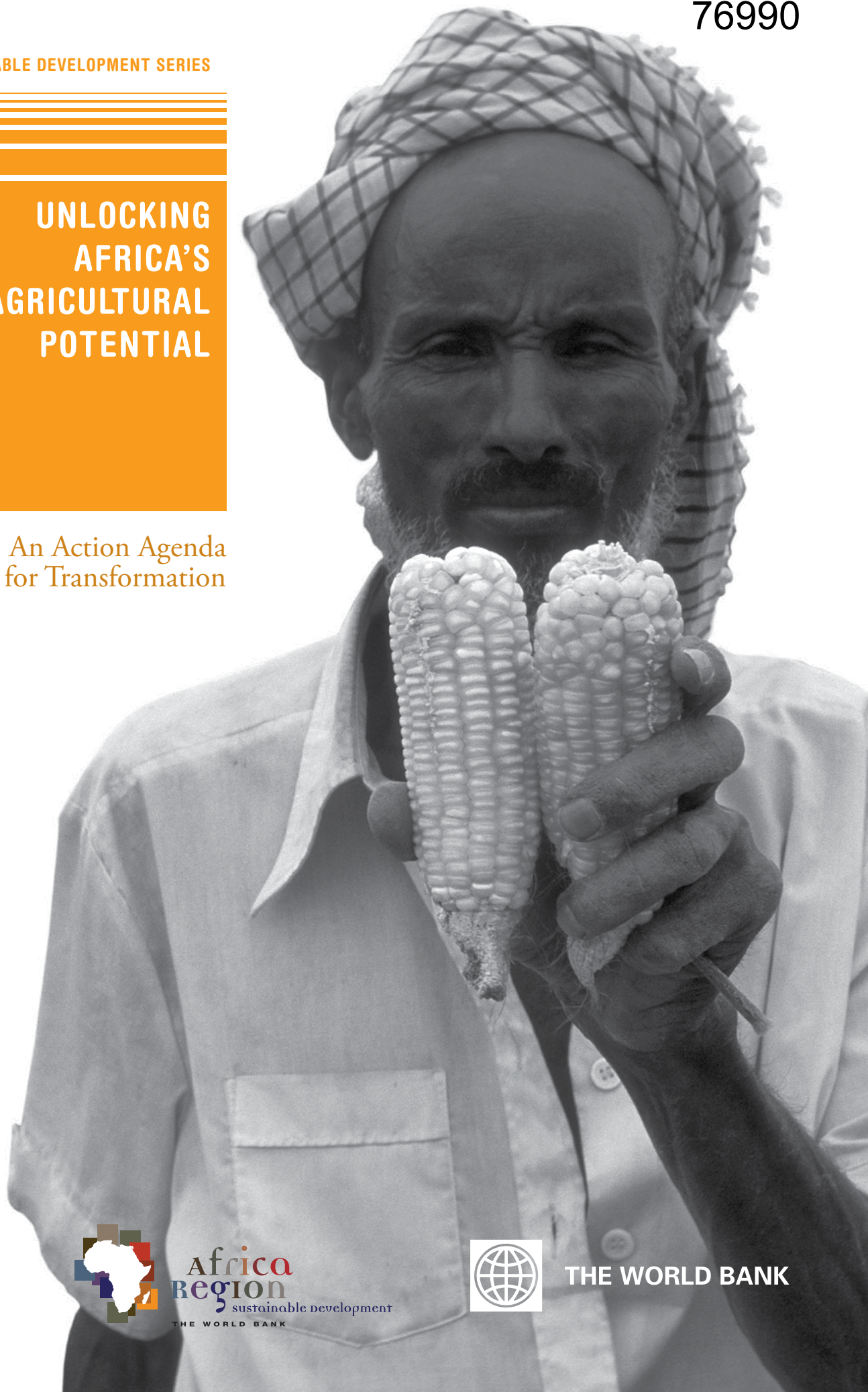




**UNLOCKING
AFRICA'S
AGRICULTURAL
POTENTIAL**

*An Action Agenda
for Transformation*



**Africa
Region**
sustainable development
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SUSTAINABLE DEVELOPMENT SERIES

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Foreword

This new Africa Region Sustainable Development Series aims to focus international attention on a range of topics, spur debate, and use robust, evidence-based, informed approaches to advance policy dialogue and policy-making. This new Series synthesizes a large body of work from disparate sources, and uses simple language to convey the findings in an easily-digestible format. Ultimately, we want to seed solutions that can help accelerate the fight to end poverty in Africa.

Across Africa, south of the Sahara, agriculture is the predominant sector in the economies of most countries, accounting for between 30 to 40 percent of gross domestic product, and the sector is a leading source of jobs for over two-thirds of Africa's population.

A country's economic, environmental and social well-being is intricately linked to a healthy, well-performing agricultural sector. Increasing investments in the farm economy can deliver high-impact development returns such as increasing rural incomes, boosting food security, making cheap and more nutritious food available to Africa's bustling cities and protecting the environment through innovations such as climate smart agriculture.

This is the overarching message of this publication, which explores how the World Bank can help Africa take advantage of a unique confluence of factors that creates a great opportunity for the region to make agriculture the engine of development that it rightfully should be. By publishing the Sustainable Development Series ahead of the Spring Meetings of the World Bank and International Monetary Fund, we seek to inform, indeed persuade, the international community about the significant development challenges confronting Africa, and the new opportunities to overcome them for a better future for all.

We want to galvanize action and forge new partnerships that can help Africa to achieve a vibrant farm economy that contributes to more growth, more jobs, better food and an overall improvement in the quality of livelihoods, particularly for poor people.

Jamal Saghir

Director, Sustainable Development
Africa Region
The World Bank
Washington, DC
April 2013



Fisherman on the White Nile (Morada). Khartoum, Sudan.
Photo: Arne Hoel / World Bank

Acronyms and Abbreviations

AgDPOs	Agricultural Development Policy Operations
AGRA	Alliance for a Green Revolution in Africa
AfDB	African Development Bank
AgWA	New Partnership for Agricultural Water in Africa
AICD	Africa Infrastructure Country Diagnostic
ASCBS	Africa Statistical Capacity Building Strategy
AU	African Union
AWM	Agricultural Water Management
CAADP	The Comprehensive Africa Agriculture Development Programme
CGIAR	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
CIWA	Cooperation in International Waters in Africa
CSA	Climate-smart agriculture
CSO	Civil Society Organizations
DPO	Development Policy Operations
DUS	Distinctness, Uniformity and Stability
EIRR	Economic internal rate of return
EMBRAPA	Brazilian Agricultural Research Corporation
FAO	Food and Agricultural Organization
GAFSP	Global Agriculture and Food Security Program
GHG	greenhouse gas emissions
ha	hectare
ICT	Information and communications technology
IDA	International Development Association
IFC	International Finance Corporation
IFDC	International Fertilizer Development Center

IFPRI	International Food Policy Research Institute
JSR	Joint Sector Reviews
M&E	Monitoring & Evaluation
NEPAD	New Partnership for Africa's Development
NPCA	New Partnership for Africa's Development Planning and Coordinating Agency
OECD	Organization for Economic Cooperation and Development
PPF	project preparation facility
PPP	Public Private Partnership
PREM	Poverty Reduction and Economic Management
REC	regional economic commission
SLWM	sustainable land and water management
SSA	Sub-Saharan Africa
SWAp	Sector Wide Approach
TFP	Total Factor Productivity
TIGA	Technology in Government in Africa
VCS	Verified Carbon Standard
WAAPP	West African Agricultural Productivity Project
WB	World Bank
WEF	World Economic Forum



THANDI FARM Worker pruning fruit trees. South Africa.
Photo: Trevor Samson / World Bank

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Mali. Photo: © Curt Carnemark / World Bank

Executive Summary

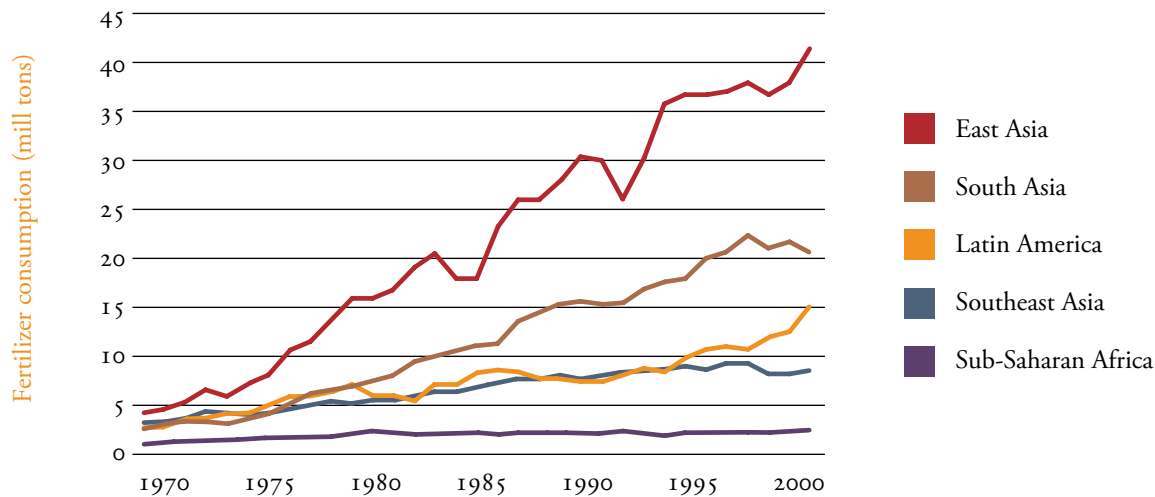
Reducing poverty in Africa is the world's supreme development challenge, and growing the agricultural sector is key to achieving a transformational impact. The agricultural economy employs 65–70 percent of Africa's labor force and typically accounts for 30–40 percent of GDP. More than 70 percent of the continent's poor live in rural areas, and agriculture is their most important economic activity.

With an abundance of labor, land and untapped water, Africa has the resources necessary for a massive expansion of agricultural production. Of the world's surface area suitable for sustainable production expansion—that is, non-protected, non-forested land, with low population density—Africa has the largest share by far, accounting for roughly 45 percent of the global total. While some large areas of the continent are arid or semi-arid, water resources are, on average, greatly underutilized. Only 2 to 3 percent of renewable water resources in Africa are being used, compared to 5 percent worldwide. Furthermore, relative to other regions, Africa has low labor costs, which should encourage the production of labor-intensive farming-related products and services. One recent study found that minimum wages in Thailand were two to three times costlier than those in Ghana and 1.6 to 2.2 times those in Senegal.

Notwithstanding these advantages, over the last 40 years Africa has been steadily losing its share of the global agricultural market. Today, Thailand exports more food products than all of Sub-Saharan Africa combined. The structural reforms of the 1990s succeeded in moderating the rate of decline, but the share overall has slowly continued its downward trend. Even as exports have fallen, imports have skyrocketed, as intra-African regional market opportunities were consistently missed time and again. This occurred because the “Green Revolution” that transformed tropical agriculture in Asia and Latin America largely bypassed Africa, with total factor productivity growth in agriculture lagging behind that of other regions. In Africa, increases in production were largely the result of increasing area under cultivation. Africa is the only developing region in which the percentage of area expansion exceeded growth in yield over the period 1990–2007. Two main factors are responsible. First, little land on the continent is actually irrigated. Of the 183 million hectares of cultivated land in Sub-Saharan Africa (SSA), 95 percent is rain-fed and less than 5 percent benefits from some sort of agricultural water management practice—by far the lowest irrigation development rate of any region in the world. Moreover, of the 7.1 million hectares equipped with irrigation equipment, only 5.3 million hectares can be considered usable. Second, modern inputs are grossly underutilized. Africa has, by far, the lowest rate of improved seed and fertilizer use of any region, a

rate that has remained constant for the last 40 years, in spite of considerable efforts by governments and donors to raise it (Figure A). The situation with other yield-enhancing inputs is similar. To some extent, this scenario can be attributed to the high cost of inputs on the continent, which will need to decrease in order for productivity to rise.

Figure A: Fertilizer Use Lags Badly in Africa



Source: Calculated from FAOSTAT.

Inadequate use of purchased inputs, along with low private sector investment in general, has been exacerbated by an unfavorable policy environment that has reduced the profitability of investments. While all developing regions taxed agricultural production from the 1960s through the 1980s, only Africa maintained net taxation of this sector—albeit at lower levels than in the past—well into the mid-2000s. Public investment in the sector was low in quantity and quality, and much of the policy towards the sector was driven by ineffective state-owned enterprises.

Recently, however, a confluence of factors has changed the farming environment for the better, presenting a golden opportunity for African agriculture to realize its full potential.

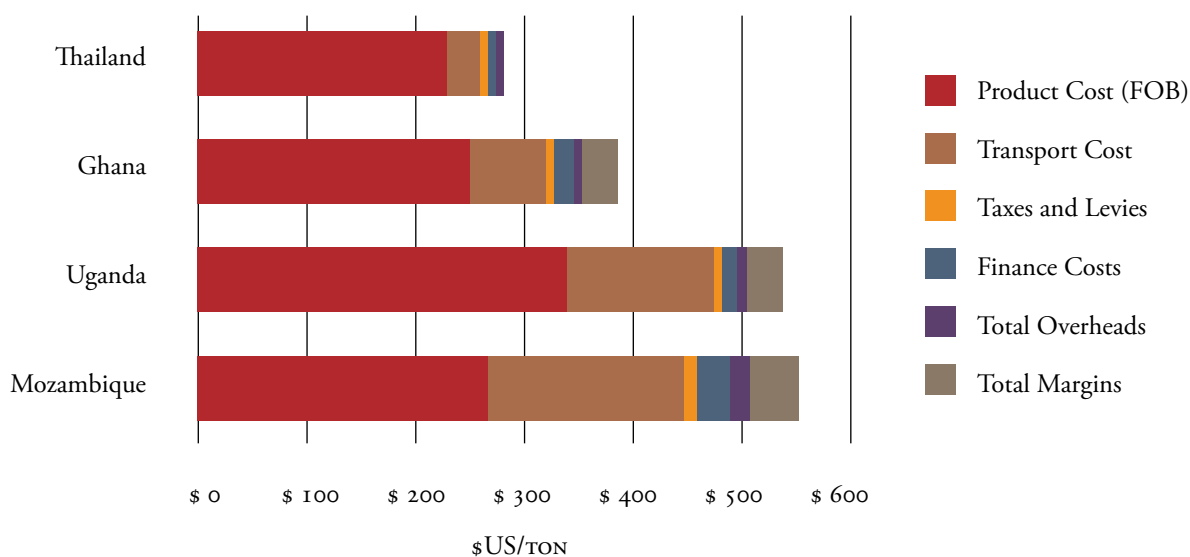
- Prices of all major African agricultural products increased dramatically in the decade beginning in 2000 and are generally forecast to remain for many years at levels higher than in the 1990s.
- Urban food markets are booming in Africa, creating a potential trillion-dollar regional market for African producers by 2030, more than triple its current size.
- Many opportunities for profitably expanding irrigated areas and increasing the use of modern technology have been identified, and the fact that African farmers are far from the technological frontier means that there is significant potential for catch-up.

- There is a much higher level of development partner interest and activity in the agricultural sector today than there was in the 2000s, with pledges of increased resources for financing and many initiatives being undertaken in collaboration with the African Union’s New Partnership for Africa’s Development Planning and Coordinating Agency (NPCA) and the Comprehensive Africa Agricultural Development Programme (CAADP) to build the policy-making and technical capacity of African governments.
- The policy environment has greatly improved, as governments have revised macroeconomic policy (including exchange rate policies that discriminated against agricultural exports in the past), reduced or eliminated the overall net taxation of the sector, and—through the Maputo Declaration—adopted a sectoral expenditure target of 10 percent of total expenditure, a figure in line with that of the Asian economies during their Green Revolution.
- Technological innovations have been lowering costs associated with implementing needed reforms, especially in land administration, which will improve security of tenure and help protect vulnerable populations from exploitation, while creating more liquid land markets. Many countries have undertaken pilots, often with World Bank support, which can now be scaled up.
- Private sector interest is on the rise, driven by the factors mentioned above; this new interest has elevated the potential for the sector’s profitability, provided sound policies and access to capital and technology are mobilized to support the sector.
- The groundwork for climate-smart agriculture has been laid, as under CAADP, draft frameworks have been adopted for developing and financing initiatives to mainstream these kinds of approaches into country-level plans, programs, and policies.
- Improved and improving transport and ICT infrastructure have opened access to new markets for produce and greater access to inputs and information.

The stage is set for African agriculture to begin to redress the imbalances of the past and assume its proper place as a major agricultural powerhouse for ending poverty. For this transformation to occur, however, many impediments must yet be overcome. Irrigation and land administration investments are key elements of the transformation, and these have particularly high preparation costs. In the case of irrigation, this fact is partly explained by the need to take full advantage of instruments such as Strategic Environmental and Social Assessments when preparing projects to ensure that they are socially and environmentally benign. Preparation and implementation of investments in land administration are complicated both by concerns over land grabs and by the shortage of professionals working in this field in Africa. For producers to participate fully in the “trillion dollar opportunity” of regional food and beverage markets, existing barriers to trade will need to be addressed. These include formal trade barriers, irregular customs procedures, poor infrastructure, erratic trade policies, and regulatory problems such as inappropriate and inconsistent

testing requirements for agricultural inputs. The African Green Revolution must begin at the farm level, with producers using modern technologies. This will not happen as long as inputs in Africa remain overpriced. This problem is illustrated by a breakdown of the cost of fertilizer in Thailand and in three African countries (Figure B). The delivered cost at the port is similar, but the African countries sampled had higher additional costs of distribution, especially with respect to transport, reflecting poor infrastructure as well as a lack of competition and inappropriate regulations. Subsidy programs have been a common policy response to help farmers overcome this handicap; as one might expect, however, such programs have tended to disproportionately benefit wealthy farmers and have often been managed in ways that crowd out the private sector.

Figure B. Comparison of Fertilizer Value Chain Costs, Thailand and Three African Countries



Source: World Bank 2013, from IFDC and Chemonics.

Climatic risk, which will be amplified by global warming, poses an additional challenge, especially in Africa’s dryland areas. More than any other productive sector, rain-fed agriculture depends crucially on weather, so Africa’s low percentage of irrigated cropland makes it especially vulnerable to droughts. Global circulation models are not always in agreement as to whether a given area is likely to receive more or less rainfall, but there is a virtual consensus that it will come more often in the form of extreme events, with droughts and floods likely to increase in magnitude and frequency in most areas. Since Africa (excluding South Africa) has the world’s lowest water storage capacity—43 cubic meters per person, compared to 6,150 cubic meters per person in North America and 750 in South Africa—it has little ability to control water flow and distribute it from periods of overabundance to seasons of scarcity. Vulnerability to climatic shocks is especially acute in dryland areas, which have a fragile ecology that limits agricultural potential, and where land

has been degraded over time (de-forested, eroded, nutrient depleted), increasing its sensitivity to weather-induced shocks and reducing the resilience of rural populations and ecosystems.

The World Bank's agricultural program in Africa has been scaled up to tackle these challenges, both quantitatively and qualitatively.

- The analytical work program has received an increased focus to ensure that the lending program is informed by the best possible knowledge base. Following the World Development Report of 2008, *Agriculture for Development*, the Africa region has undertaken a series of regional flagship studies and knowledge products that have (i) distilled lessons of experience from other countries that had conditions similar to those of Africa, particularly Brazil and Thailand, which now have successfully led the way to creating a successful, vibrant agribusiness sector; (ii) focused on how to break down the barriers to regional trade in Africa; and (iii) collected best practices to scale up successful experiences in land policy and administration.
- The World Bank is rebalancing partnerships. In addition to hosting the TerrAfrica and CIWA programs, the Bank has formed strong partnerships with many regional institutions, particularly CAADP and Grow Africa, and has aligned Bank lending and analytical activities with the four pillars of the CAADP.
- The Bank lending program is being expanded to respond to new and emerging demands. There has been a very significant scale-up in agricultural lending, from US\$0.4 billion in 2008 to US\$1.2 billion/year in FY11/12, with a changing mix of instruments tailored to meet the new requirements of these challenges, including increased focus on sector budget support, public-private partnerships (PPPs), and larger sub-regional operations that generate economies of scale.

Looking forward, providing the transformational impact to help Africa achieve its own Green Revolution will require delivering simultaneously on productivity growth and market connections, while enhancing resilience to climate change. Given the long-term nature of this agenda and the weight of policy change it entails, the mix of instruments will need to shift towards more policy-oriented and programmatic approaches, with 30 percent of new lending consisting of Development Policy Operations (AgDPOs) and Sector-wide Approaches (SWAs). African countries through CAADP would be in the driver's seat for implementation of sector investment plans, which may be supported with SWAp operations. The medium-term plan is to scale up Bank lending to about US\$3 billion/year, with ambitious targets in five key thematic areas:

Irrigation: doubling irrigated area from the current 20 percent to 40 percent of area by 2030. This goal has a corresponding investment cost roughly estimated at US\$40 billion, of which the Bank could finance one-quarter of the investment needs.

Land administration: moving from modest and fragmented small-scale and pilot projects to bold and systematic projects. Building on the recent major pieces of knowledge work on land

policy and administration and pilot programs in several countries, it is time for a big push to scale up best practices, to improve security of tenure, guard against land grabs, and develop well-functioning land markets. The aim would be to prepare at least two new land administration projects per year for annual lending of at least US\$150m, totaling at least US\$1.5 billion over 10 years. In this span of time, targets would include reducing the time required for registering property from 65 days currently to 30 days.

Access to technology and inputs: reducing the yield gap by half by 2025, while enhancing resilience to climatic shocks through dissemination of climate-smart agricultural technologies.

One key element will be to increase the availability and reduce the cost of productivity-enhancing inputs. Other elements include a deepening relationship with CGIAR Centers and partners in South-South technology transfer (e.g., with EMBRAPA, Brazil's state agricultural technology agency), and expanding to other sub-regions the highly successful model of regional cooperation in technology development embodied in promising projects, such as the West African Agricultural Productivity Program.

A priority in the Bank's support of technology generation and diffusion will be the mainstreaming of climate-smart agriculture, focusing on water management, agricultural risk management, and conservation farming. Climate-smart agriculture (CSA) is about strengthening farmers' resilience to climate change, while at the same time reducing agriculture's climate imprint through curbing greenhouse gas (GHG) emissions by limiting deforestation and increasing carbon storage, including in the soil. Climate-smart agriculture relies on the limitless ingenuity of farmers, and includes proven techniques such as mulching, low- or no-till production techniques, and developing drought- or flood-tolerant crops to meet the demands of a changing climate. But CSA is also about weather forecasting, early warning systems and risk insurance. Finally, CSA seeks to highlight changes in policy that will help farmers adapt to and succeed in combating the ill effects of climate change.

One major pillar of the climate change strategy of the World Bank's Africa Region (World Bank 2009) is to assist African countries in taking advantage of opportunities to "do well while doing good" by reducing net GHG emissions and then selling these reductions in international carbon finance markets. Given the high share of emissions from land and forest degradation and deforestation in the region's emissions profile (over 60 percent of Africa's GHG emissions come from land and forest degradation), it is clear that agriculture will play a key role here. In a significant development, a new, cutting-edge methodology has just been approved by the Verified Carbon Standard (VCS) to measure and value carbon sequestered through the sustainable management of agricultural land. The VCS remains the gold standard in the voluntary carbon market, and this methodology gives project developers the opportunity to account for emission reductions from improved management of land. The quantified carbon can then be sold on the voluntary market on behalf of farmers to generate additional revenues.

Market access: removing trade barriers and improving competitiveness to double trade in 10 years. Through multisectoral efforts, the Bank's Poverty Reduction and Economic Management team

(PREM), the CAADP trust funds, and other partners will support regional economic commissions in their efforts to develop regional standards for food trade and to improve and harmonize regulatory requirements for inputs. Development Policy Operations (DPOs) at the country and regional levels focused on these issues would support the reform agenda. The strategy would also include a push to improve trade and transport infrastructure as well as food safety systems, with a 10-year target of cutting by half the costs related to bringing produce to market.

Access to financial services: unlocking commercial lending and long-term financing. All of the measures above that improve the sector's profitability will make it a more investment-worthy client in the view of financial institutions. Another key to unlocking this access will be reducing the risk, both real and perceived, of lending to the sector by improving insurance and collateral instruments (for example, by improving land security, developing warehouse receipts, and establishing commodity exchanges). Interventions to support the development of value chains will also involve improving access to short- and medium-term finance, for example, through outgrower schemes and contract farming. The enabling environment for these developments lies in the public domain, and for this the Bank will deploy knowledge-based instruments, including DPOs for policy reform. But finance itself is primarily a private sector function, so much of this agenda will need to be tackled in conjunction with the IFC and with civil society organization (CSOs) such as the Gates Foundation, which is sponsoring an initiative to facilitate the wider presence of financial institutions in rural areas.

Moving forward in all of these areas will also require increasing private sector investments in agriculture by facilitating and fostering PPPs. In view of the long gestation periods associated with bringing projects to financial closure, the sector needs a dedicated PPP project preparation facility. Under the New Alliance Initiative adopted by G8 in 2012, efforts led by USAID are ongoing to set up a Fast Track Facility for this purpose. The Bank has been providing advice about the governance structure of this Facility and about ways in which to align it closely with CAADP. To the extent that this Facility would be able to mobilize resources from traditional donors as well as from the private sector, it is of strategic interest that the Bank be a close and constructive partner in this initiative as a pathway for further scale-up of its engagement in African agriculture, while leveraging private sector investments through innovative PPPs.



Preparing for cultivation. Madagascar.
Photo: Yosef Hadar / World Bank

Transforming agriculture in Africa is not simply about helping Africa; it is essential for ensuring global food security. Reducing poverty in Africa is the world's supreme development challenge and growing the agricultural sector is key. This sector employs 65–70 percent of Africa's labor force and typically accounts for 30–40 percent of GDP. More than 70 percent of the continent's poorest populations live in rural areas and agriculture is their most important economic activity. Furthermore, the poverty-reduction elasticity of agricultural growth is up to four times higher than that of non-agricultural growth. As a consequence, improving agricultural performance is essential for Sub-Saharan Africa's growth and for achieving the Millennium Development Goal of halving poverty by 2015.¹

But Africa's agriculture is also of critical importance when it comes to meeting the world's future needs for food and fiber. With the global population expected to exceed 9 billion by 2050, food security—producing enough food of sufficient quality and making it accessible and affordable for consumers around the world—is one of the most important policy objectives of our time. The United Nations estimates that global food demand will double by 2050, with much of that growth driven by developing countries. The world will then need to feed 2.3 billion more people, and given the deep transformation of growth trajectories in low-income countries, these populations will be increasingly affluent and will demand more, different, and better food. But how will the world meet this additional demand? Without large increases in the food supply in world markets, the recent food crisis could be just an omen of continual future crises. Furthermore, this ramp-up of production must be conducted in a sustainable fashion and in the face of a changing global climate. African agriculture could be hit hard by climate change, but it can minimize the impact of such forces with climate-smart production technologies, some of which will have the side benefit of reducing net emissions of greenhouse gases. Given Africa's productive potential, it must be a key contributor to feeding the world in the future. But to fully realize that potential will require overcoming many obstacles through innovative and transformative approaches.

1 WB Africa Agricultural Fact Sheet: <http://go.worldbank.org/GUJ8RVMRL0>.



Gathering corn. Kenya.
Photo: © Curt Carnemark / World Bank

3 The Potential for Increasing Production and Productivity in African Agriculture is Huge

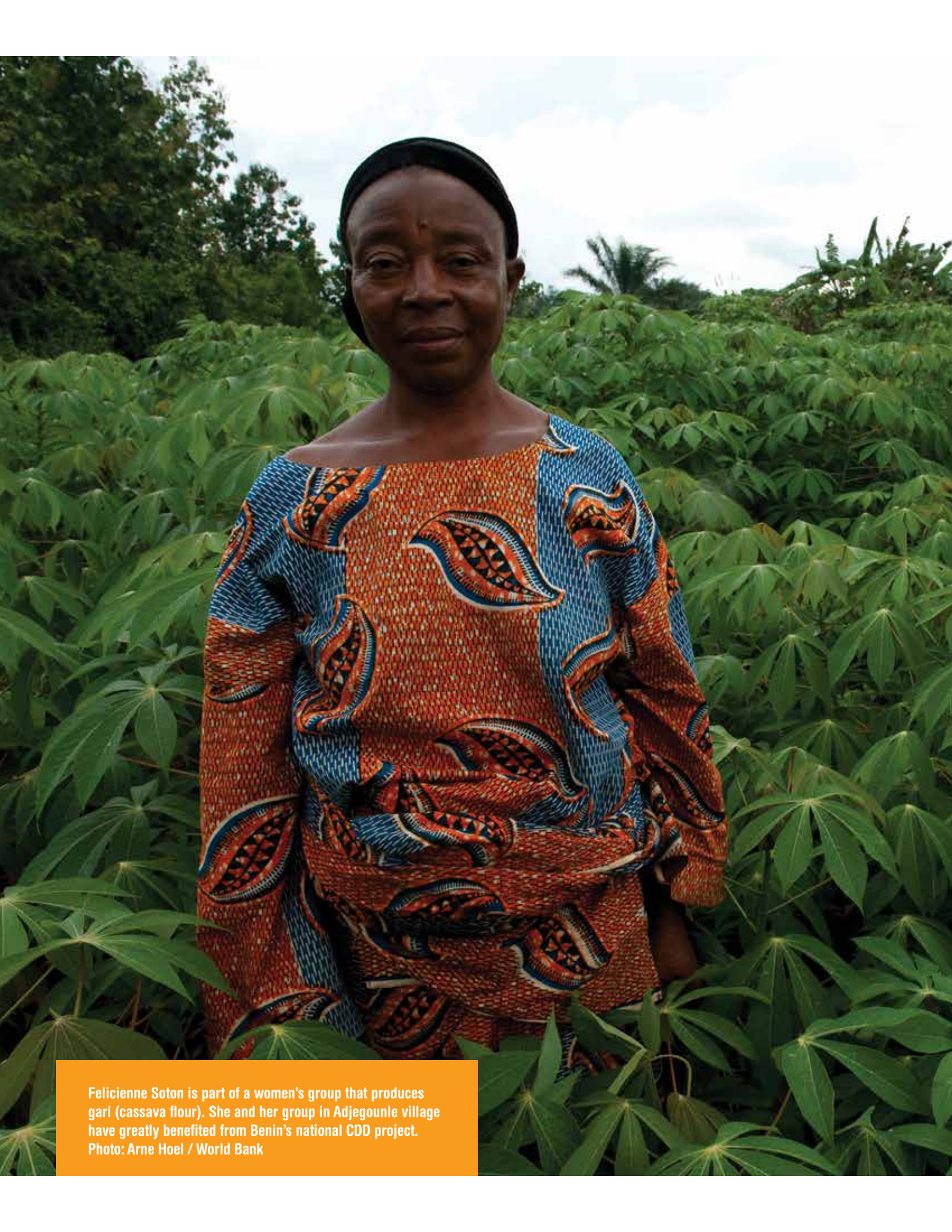
Africa has the natural ingredients needed to greatly expand agricultural production. Relative to much of the rest of the world, it has an abundance of the major natural inputs necessary for growing crops and raising livestock: unused land and water.

- **Abundant land.** Of the world's land area suitable for sustainable production expansion—that is, non-protected, non-forested, and with low population density—Africa has the largest share by far, accounting for about 45 percent of the total.² About two-thirds of this area is spread over eight countries: Angola, the Democratic Republic of Congo (DRC), Madagascar, Mozambique, South Sudan, Sudan, Tanzania, and Zambia (World Bank 2013, Deininger and Byerlee 2011). In contrast, the region in second place, Latin America, accounts for only 28 percent of area suited for production. In Latin America, however, a large majority of this land (73 percent) is accessible, being located within six hours' travel time to the nearest market, compared to only 47 percent in Africa—a result of the generally poor state of infrastructure on the continent, which raises transportation costs and further limits the movement of agricultural products.
- **Abundant untapped water resources.** While some large areas of the continent are arid or semi-arid, on average water resources are greatly underutilized. Only 2–3 percent of renewable water resources are being used in Africa, compared to 5 percent worldwide (World Bank 2013). Although a number of basins are currently experiencing or are approaching water scarcity levels, this is mainly due to a lack of irrigation development or storage capacity, rather than to absolute water scarcity.

Furthermore, relative to comparators, Africa has low labor costs, which should encourage the production of labor-intensive products. African farmers can produce many commodities at farm-level costs competitive with those in other countries, with one factor being the much lower average wage for unskilled workers (World Bank 2009, Morris et al. 2009). Minimum wages in Thailand

² Deininger et al. 2010. Suitable land for expansion is defined as land not forested or protected, and with a low population density. Many other recent studies have identified Africa's huge potential for expansion, including World Bank 2008 and 2009 and Nin-Pratt et al. 2009.

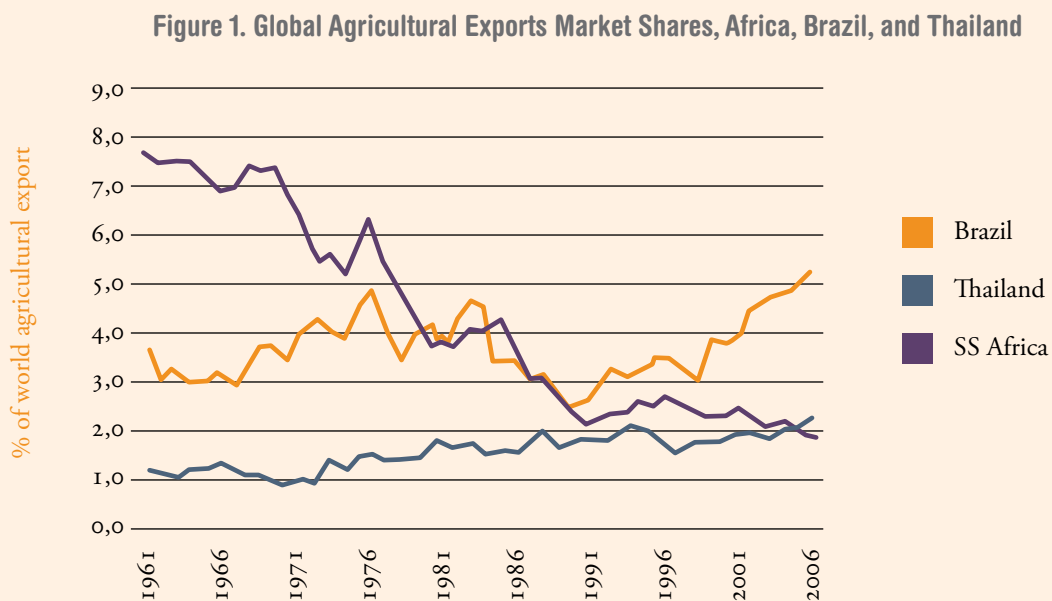
were found to be two to three times those in Ghana and 1.6 to 2.2 times those in Senegal (World Bank 2013). Yet, this competitive advantage of lower wages does not necessarily translate into overall lower production costs. In a study comparing Zambia to Thailand in maize production, Zambia was found to have unskilled labor cost/day less than half Thailand's. However, because yields were so much lower, the labor cost per ton produced was higher in Zambia (World Bank 2013). Low wages alone may not be enough to promote investment and the adoption of higher-yielding production technologies when those improved production methods require better management and a higher level of worker skill. Competitiveness is further undermined by the higher logistics costs in Africa.



Felicienne Soton is part of a women's group that produces gari (cassava flour). She and her group in Adjegounle village have greatly benefited from Benin's national CDD project.
Photo: Arne Hoel / World Bank

4 For Many Reasons the Region Has Not Been Living Up to Its Potential

4.1 Africa's Shares in Global Markets Have been Falling for over 40 years

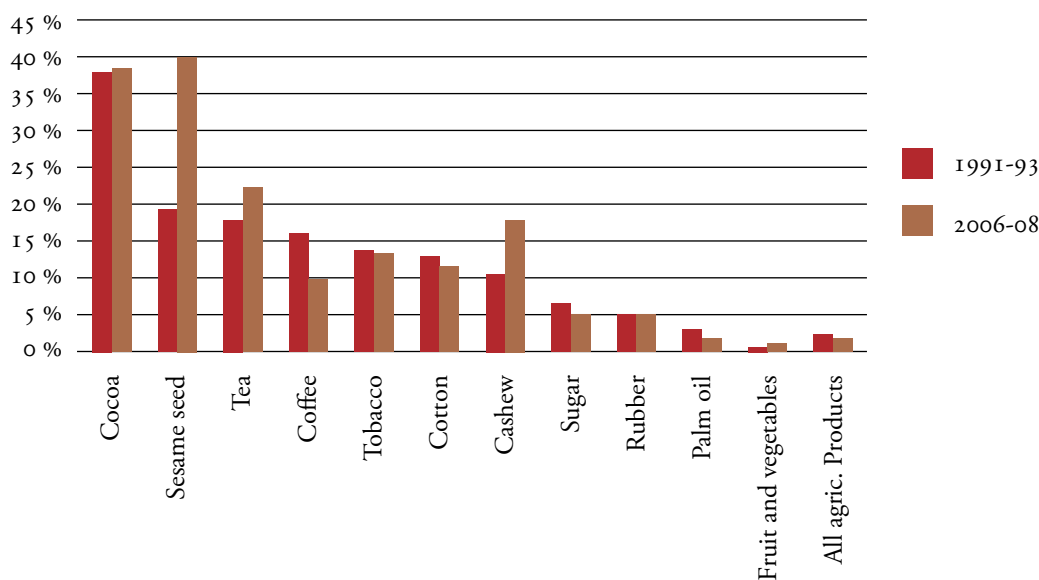


Source: World Bank 2013, from FAOSTAT.

Taking a broad historical perspective, Africa saw a rapid erosion in competitiveness in agricultural products destined for global markets in the three decades leading up to the 1990s. From a share of 7 to 8 percent in the 1960s, Africa's agricultural exports fell to about 2 percent by the beginning of the 1990s, driven by a predominantly poor policy environment (Figure 1). The structural reforms of the 1990s succeeded in moderating the rate of decline, but the share overall has

slowly continued its downward trend. In the meantime, other important agricultural exporters have seized market share, to the extent that Brazil now has several times the share of the entire African continent, and even Thailand — with a tiny fraction of Africa’s land area —has a larger market share. This overall gloomy historical picture notwithstanding, a more recent and more disaggregated view is somewhat mixed. Since the beginning of the 1990s, Africa has held its own in some crops (cocoa, rubber, fruits and vegetables, tobacco) and even gained market share in others (cashew, tea, sesame seed), showing some evidence of its productive potential (Figure 2). On balance, however, Africa’s share of agricultural exports has continued to decline.

Figure 2. Africa’s Global Market Share of Major Exports, 1991-93 and 2006-08



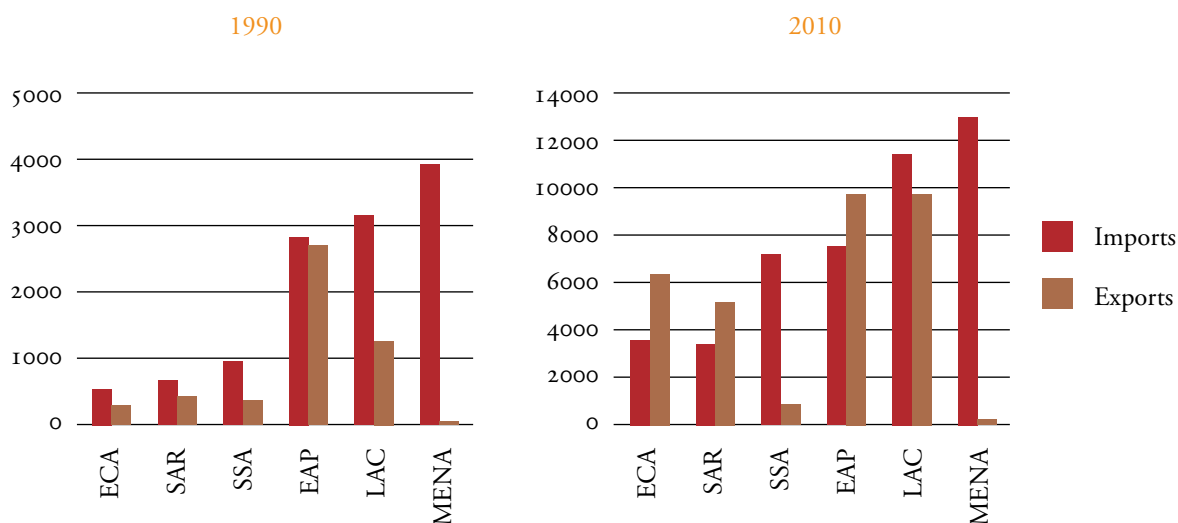
Source: World Bank 2012, from FAOSTAT.

4.2 The Gap between Regional Demand and Supply Has Been Widening

As regional market opportunities were missed, the gap between regional demand and supply has widened, causing imports to skyrocket. While African exports have been on average losing market share, imports—particularly of food staples—have boomed. From the 1990s to the 2000s, the balance of trade in food staples was moving from deficit (imports exceeding exports) to surplus in Europe and Central Asia, South Asia, and East Asia and the Pacific; in Sub-Saharan Africa, however, this gap greatly expanded (Figure 3). Food trade deficits are understandable and even desirable in

a region such as the Middle East and North Africa, which has no comparative advantage in food production. But in Sub-Saharan Africa, where all of the natural ingredients for efficient production are present, deficits of this nature signal that something fundamental is amiss.

Figure 3. Aggregate Food Staple Trade by World Regions, 1990 and 2010 (millions, US\$) 1990 2010

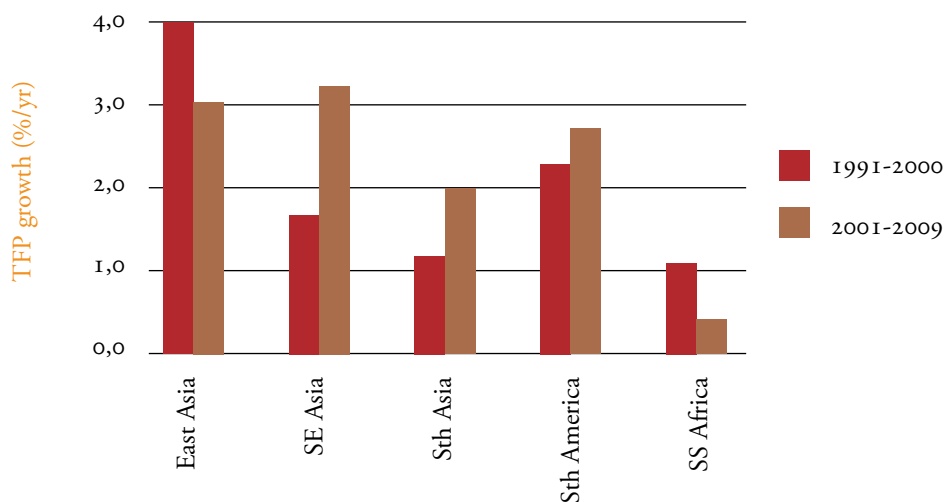


Source: COMTRADE, cited in ACHFA.

4.3 Productivity Growth in Cash and Food Crops Has Been Low Relative to Other Countries

The “Green Revolution” largely bypassed Africa. The continent’s total factor productivity growth (the best measure of overall efficiency in use of all inputs) has lagged behind that of other regions. A comparison of Africa’s performance with that in South America and three subregions of Asia over the course of two decades indicates that Africa began the 1990s with lower total factor productivity (TFP) than its counterparts; while other regions enjoyed higher growth in the 2000s than in the 1990s. Africa’s growth rate fell even lower, further magnifying the TFP gap (Figure 4). Unlike other regions, where production increases were mainly associated with yield growth due to better use of inputs and adoption of improved production technologies, in Africa increases in production were largely the result of expansion of the area under cultivation. It is the only developing region in which the percentage of area expansion exceeded growth in yield over the period 1990- 2007 (Deininger et. al. 2011).

Figure 4. Total Factor Productivity Growth in Africa



Source: World Bank 2013, based on Fuglie 2012.

4.4 There is Great Unexploited Potential for Expanding Irrigation

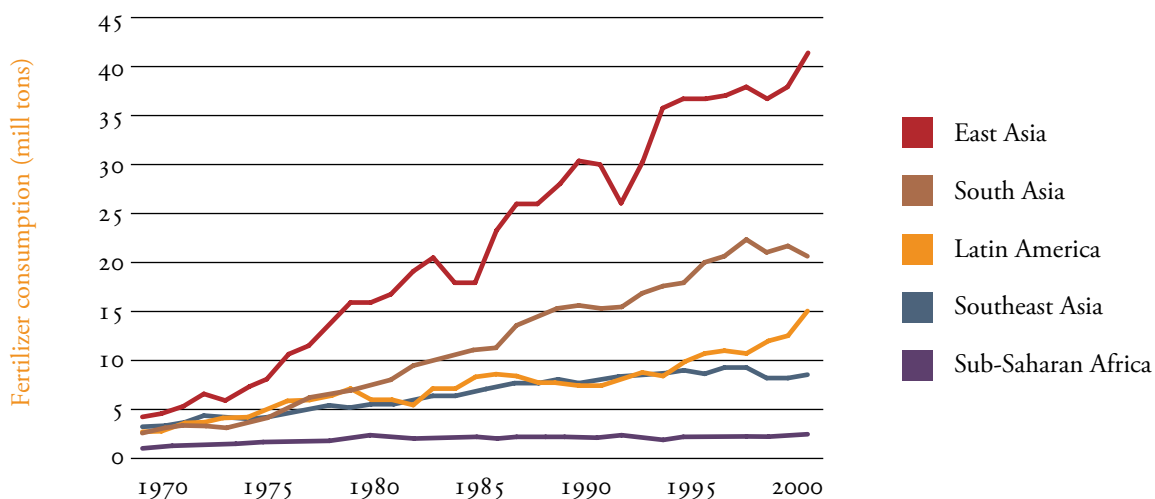
One reason for lagging productivity is unexploited irrigation potential. Of the 183 million hectares (ha) of cultivated land in SSA, 95 percent is rain-fed and less than 5 percent benefits from some type of Agricultural Water Management (AWM)—by far the lowest irrigation development rate of any region in the world. Moreover, of the 7.1 million hectares equipped for irrigation, only 5.3 million are currently operational. Investment in irrigation projects steadily declined in the 1980s and 1990s, partly in response to the many difficulties encountered by large-scale irrigation investments. These included resistance due to fears of adverse environmental and social impacts of large dams, low recovery of operation and maintenance costs, and inadequate maintenance resulting in deterioration of the infrastructure. Other factors included poorer market opportunities, higher investment costs than in other regions and insufficient consideration for upstream and downstream value chain effects.

4.5

Limited Use of Inputs and Adoption of New Technologies Has Also Reduced Productivity

Another root cause of the low productivity levels is the limited use of inputs and the slow adoption of improved production technologies. Africa has by far the lowest rate of fertilizer use of any region, a rate that has virtually remained the same over the last 40 years despite considerable efforts by governments and donors to raise it (Figure 5). This is not entirely surprising, considering fertilizer's high cost in this region. Use of other yield-enhancing inputs—such as improved crop varieties, pesticides (herbicides, insecticides, fungicides), and mechanization—are also limited. Moreover, participation in farmer extension and education programs aimed at increasing knowledge and skills and meant to complement the use of higher-yielding input is low and has been declining (Pardey, Alston, and Piggot 2006). In the absence of proper management techniques, even low yields are not sustainable in the long term on currently cultivated lands, as soils are being depleted of nutrients and, without fertilizer, they are not replenished. Post-harvest losses due to spoilage and pests resulting from improper storage or management also represent a significant problem. In some regions of Mozambique, for example, post-harvest losses for cassava range from 15-40 percent and 12-25 percent for maize (FAO 2010).

Figure 5. Fertilizer Use Lags Badly in Africa



Source: Calculated from FAOSTAT.

4.6

In the Past, the Agricultural Policy Environment Has Been Poor

Inadequate use of purchased inputs, along with low private sector investment in the sector in general, have been driven to a large extent by the unfavorable policy environment. While all developing regions taxed agricultural production in the 1960s through the 1980s, Africa is the only one that maintained net taxation on this sector well into the mid-2000s (Anderson 2009, Anderson and Masters 2009). Taxation was in some countries explicit (e.g., export taxes), but was often implicit through overvalued exchange rates and high protection for industrial production. Public expenditure in the sector was low in both quantity and quality, with much of the spending on unproductive subsidies and on parastatal enterprises, which dominated market channels for inputs and outputs, crowding out private sector investment. These disincentives to private investment, some of which were unique to the agriculture sector, were compounded by a generally poor overall business environment.



Tilling fields. Nigeria. Photo: © Yosef Hadar / World Bank

5 Recently Africa's Agricultural Business Environment Has Greatly Improved

5.1 Prices Are Higher, albeit More Volatile

The cost of all major African agricultural products increased dramatically in the decade since 2000. As with other commodity markets in recent years, global demand and prices for many African crops have been steadily rising. Most have moderated somewhat since 2010, but many of the same factors that caused the run up in the 2000s remain in play, including population and income growth and increasing pressure on land resources for use in biofuels. Consequently, medium-term price forecasts generally call for prices higher than the levels of the 1990s in real terms, albeit lower than the peaks at the end of the 2000s. (Important exceptions are cotton and tobacco.) However, higher price volatility increases commercial risks, thereby attenuating incentives for investments aimed at capturing benefits associated with overall higher price levels.

Table 1. Commodity Prices, Historic and Projected

Unit	Commodity	Price (real 2005 US Dollars)					Forecast (real 2005 US Dollars)		
		1980	1990	2000	2010	2012	2015	2020	2025
¢ / kg	Cocoa	342	131	101	277	198	180	161	144
¢ / kg	Coffee (robusta)	426	122	102	154	188	145	127	111
¢ / kg	Tea	218	213	210	255	240	228	220	212
\$ / kg	Palm oil	766	300	347	798	828	704	607	523
\$ / kg	Maize	164	113	99	165	247	195	172	150
\$ / kg	Rice	539	280	227	433	467	391	350	314
¢ / kg	cotton	271	188	146	202	163	156	160	163

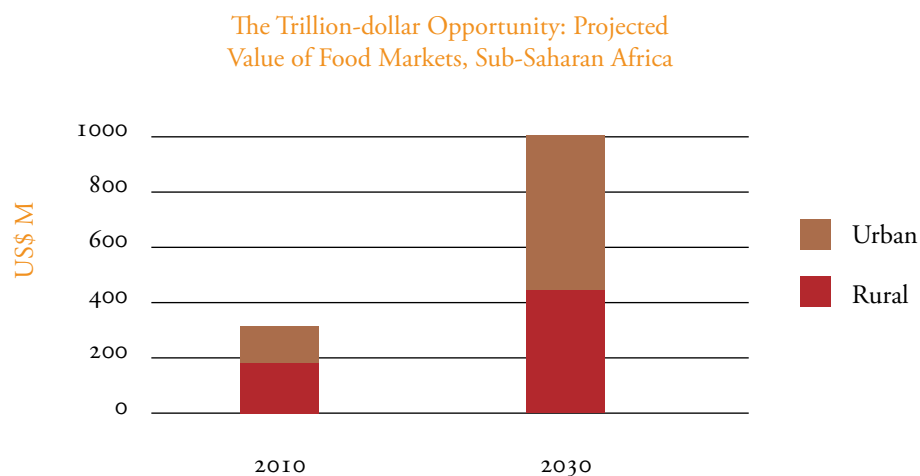
Unit	Commodity	Price (real 2005 US Dollars)					Forecast (real 2005 US Dollars)		
		1980	1990	2000	2010	2012	2015	2020	2025
¢ / kg	Rubber	187	89	75	324	280	250	222	196
\$ / kg	Tobacco	2,986	3,508	3,332	3,837	3,560	3,127	2,897	2,679

Source: World Bank data.

5.2 Urban Food Markets Are Booming in Africa

Population and incomes are growing rapidly in the region, with a consequent increase in food demand, especially for higher-value products. On top of this, Sub-Saharan Africa is undergoing the most rapid urbanization of any region, and urban consumers spend an average of 45–55 percent of their incomes on food (Jayne et al. 2009). If NEPAD’s projections are correct, incomes will grow by 6 percent per year; assuming marginal expenditure on food of 0.5 (compared to the current figure of 0.6), food markets would reach US\$1 trillion by 2030 (compared to the current figure of US\$313 billion), with a large majority of the growth driven by urban demand (World Bank 2013). At the same time, the projected growth of urban food markets implies that these markets will become more formal, with greater emphasis and premium on compliance with food safety standards. African farmers will need to up their game in this arena to capture the opportunities associated with the projected spectacular growth of urban food markets.

Figure 6. Increases in Food Demand will be Driven Largely by Growing Urban Population



Source: World Bank 2013.

5.3

There are Enormous Opportunities to Improve Productivity

There is high technical and economic potential for increasing productivity, and the fact that African farmers are far from the technological frontier means that there is a lot of potential for catch-up. Productivity growth has been low in the past, but this has not been due to an inherent lack of productive potential. Morris et al. (2009) demonstrated that conditions in some parts of Africa compare favorably to those in the Cerrado region of Brazil and in Northeast Thailand, two areas that have exhibited remarkable productivity increases. Productivity can be increased by both irrigating more area and improving production technology.

The low level of development of irrigation mentioned above is not due to a scarcity of viable opportunities. In fact, the Africa Infrastructure Country Diagnostic (AICD) concluded that Africa's "grossly underutilized potential" should be tapped by at least doubling the region's equipped area for irrigation over the next 10 years. IFPRI's background research work for the AICD confirms that the physical potential for irrigation expansion in Africa amounts to 39 million ha. It argues that, if initial investment costs are kept to best-practice levels,³ and if market access, complementary inputs, extension of credit, and a supportive policy and institutional environment are in place, both large-scale irrigation schemes and small-scale irrigation schemes can be economically developed in Africa, with economic internal rates of return in excess of 12 percent. Indeed, according to the AICD, profitable large-scale irrigation appears economically feasible on about 1.3 million hectares. The countries with the greatest potential for such large-scale investments are Ethiopia, Mali, Mozambique, Nigeria, Sudan, Tanzania, Zambia, and Zimbabwe, all with more than 100,000 ha of potential, based on the existence or projected development of water storage reservoirs, which are generally multipurpose (the cost of the dam being essentially paid by the energy production).

The small-scale irrigation potential is much greater because large, existing rain-fed areas could be profitably converted to small-scale irrigation. Again, restricting attention to the economically viable projects, profitable small-scale irrigation could take place on 5.5 million ha. In all regions except southern Africa, small-scale irrigation has a higher internal rate of return than does large-scale irrigation. By far the greatest potential is found in Nigeria, which accounts for more than 2.5 million (or almost half) of the suitable hectares. Countries such as Cameroon, Chad, Ethiopia, Mali, Niger, South Africa, Sudan, Tanzania, Togo, and Uganda each has at least 100,000 hectares of potential.

The AICD demonstrates that these economic rates of return (EIRR > 12 percent) can be realized only if a significant share of the irrigation area is sown with market-oriented, higher-value

³ Best practice would be around \$3,000/ha for the water distribution component of large-scale irrigation, and \$2,000/ha for small-scale. Costs of recent projects have been on average significantly higher than best practice. See Foster and Briceño-Garmendia 2010.

crops. This underscores the need for complementary investments in roads, extension services, and access to markets, as well as increased use of modern inputs and technologies. This need is especially acute in view of the fact that the projected rapid growth of urban food markets will shift demand towards higher-value agriculture products.

With respect to input use, Africa now has the largest productivity gap (the difference between actual current yields per hectare of land and estimated potential yield) of any region in the world (Deininger et. al. 2011). Yields of maize in demonstration plots were two to five times the actual average yields in the country in a sample of six African countries in which this is an important crop (World Bank 2007). New research from the International Maize and Wheat Improvement Center (CIMMYT) and the International Food Policy Research Institute (IFPRI), suggests that rain-fed producers in east and southern Africa may be growing only 10 to 25 percent of the wheat that is both biologically possible and economically profitable.⁴.

Table 2. Current Yield as Percentage of Potential Yield, by Region

Region	Maize	Oil palm	Soybean	Sugarcane
Asia (excluding West Asia)	0.62	0.74	0.47	0.68
Europe	0.81	N.A.	0.84	N.A.
North Africa and West Asia	0.62	N.A.	0.91	0.95
North America	0.89	N.A.	0.77	0.72
Oceania	1.02	0.6	1.05	0.91
South America	0.65	0.87	0.67	0.93
Sub-Saharan Africa	0.2	0.32	0.32	0.54

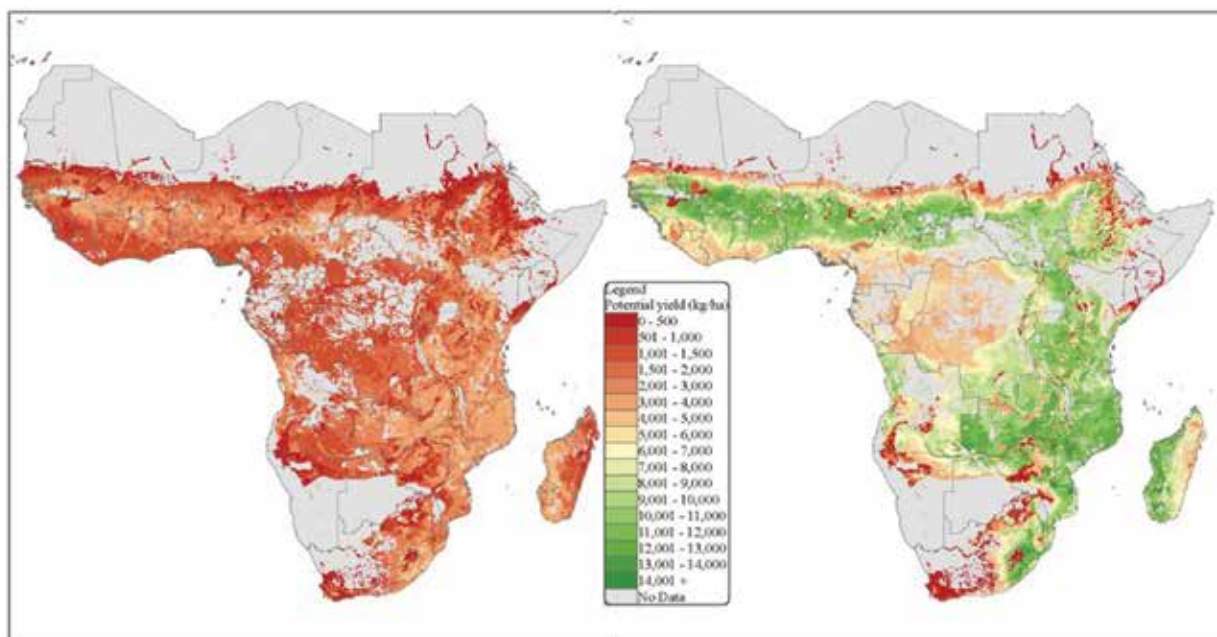
Source: Deininger et. al. 2011, from Fischer and Shah 2010.

Note: n.a. = not applicable.

The fact that the average African farmer’s productivity is low even relative to that of the best producers in her own country implies that many farmers could improve yields simply by reaching the current production possibility frontiers, without any dramatic new breakthroughs or international technology transfers. Figure 7 demonstrates the dramatic difference in production potential across Africa, depending on intensity of input use.

⁴ <http://www.irinnews.org/Report/96510/FOOD-We-want-wheat-Africa-s-growing-cereal-demand>

Figure 7. Potential Maize Yields on Currently Cultivated Area, Low Input vs. High Input



Source: Authors' calculation, using FAO Global Agro-ecological Zone database.

5.4 There is an Increasing Focus from Development Partners

There is a high level of development partner interest and activity. While donor and development partner interest in African agriculture lagged in the 2000s, it has recently manifested with renewed vigor, both with respect to finance and to other, more technical forms of assistance. The G8 made a commitment at L'Aquila, then again in Pittsburgh, to increase agriculture funding for developing countries by US\$21 billion. The Global Agriculture and Food Security Program (GAFFSP), a multidonor mechanism that is global in nature but of particular relevance for Africa, was established as a mechanism to mobilize and competitively allocate a portion of this external funding. However, hobbled by the economic downturn in OECD countries since 2008, external public resource mobilization for agriculture has fallen short of initial expectations. The IDA has nevertheless ramped up its lending to agriculture in Africa (see below), and the IFC is providing increased support for private sector development, including through instruments for value chain integrated solutions that provide financing and inputs.

Other important development partner activities include:

- **Several programs aimed at improving statistics and data to lay the foundation for a better understanding of African agriculture and more evidence-based decision making.** There is an international initiative to improve agricultural statistics (involving FAO, EUROSTAT, the WB, and AfDB), in conjunction with which the Bank has recently developed an Africa Statistical Capacity Building Strategy (ASCBS). A Gates-funded program implemented by the World Bank seeks to improve National Statistical Offices' use of rural household socio-economic surveys to provide information that is useful for a range of monitoring and impact assessment in the sector. The program targets seven pilot countries for direct support and is producing toolkits and technology innovations that are being disseminated to a wider group of country statistical offices. The World Bank (also with Gates funding) is undertaking programs focused on SSA that are improving livestock data and agribusiness indicators.
- **The New Partnership for Agricultural Water in Africa (AgWA), currently hosted by the FAO Regional Office in Addis Ababa.** The objectives of this partnership are to support activities related to advocacy, mobilizing resources, sharing knowledge, building capacity and harmonizing partner programs related to agricultural uses of water.
- **The African Water Facility.** This is a Trust Fund hosted by AfDB. The recently released 2012-2016 AWF Strategy places a large emphasis on the "preparation of investment projects," a new priority that will represent 70 percent of project commitments over the next five years. Other strategic priorities include "enhancing water governance" and "promoting water knowledge."
- **The Cooperation in International Waters in Africa (CIWA).** This multidonor trust fund, hosted by the World Bank, has been designed in recognition of the fact that all of Africa's major water sources are shared by two or more countries. It aims to strengthen cooperative management and development of international waters in Africa through support to the riparian states and regional bodies to improve sustainable water resources development and management.
- **TerrAfrica, a program to improve natural resource management.** The program involves 20 Sub-Saharan countries and is led by the African Union's New Partnership for Africa's Development Planning and Coordinating Agency (NPCA). The work program focuses on country-level activities that improve investment programming and implementation, while reinforcing country leadership on the land agenda. Since its establishment in 2005, TerrAfrica has already leveraged more than US\$2 billion in investments in sustainable land and water management (SLWM) and 205,000 ha of additional lands are now benefiting from SLMW practices. This includes support for the Africa Union's "Great Green Wall" initiative to encourage planting a wall of trees to fight desertification.

5.5

The Policy Environment Has Improved

Compared to previous decades, the policy environment has greatly improved. The macroeconomic environment in many African countries is today not only broadly favorable to agriculture but is also more favorable than was the case in Brazil in the 1960s, when the agricultural revolution began in the Cerrado region. Because of the spread of macroeconomic stability, the introduction of market-determined exchange rates and opening of trade regimes, economic growth rates have sharply accelerated. Net taxation of agriculture has fallen across Africa; as of 2004, measured taxation was significantly lower than in previous decades in a sample of countries (Anderson and Masters 2009), and an updated estimate as of 2010 even showed a net subsidy. Although this latter result was driven by a small number of countries, with the majority in the sample still showing net taxation, the overall trend over time is clearly towards a more supportive incentive structure for agriculture. African countries are also more keen today than in the past to promote private sector investments and take “doing business” rankings more seriously than ever.

Lower inflation and real interest rates favor expanded agricultural investment. The overall business climate has improved markedly in recent years in many African countries—including (to varying degrees) in Mozambique, Nigeria, and Zambia. Investments in basic infrastructure such as roads, electricity, water, and communications are being given priority, and institutional reforms are being implemented to reduce administrative burdens on businesses and combat corruption. Decentralization initiatives and the development of civil society have improved the ability of rural populations to participate in their own development and defend their interests. This, in turn, has started to open space for independent producer and business organizations of all kinds. A number of African countries have already reformed (or are in the process of reforming) their land laws, protecting customary rights while at the same time creating opportunities for security of tenure for investors.

The low level of public investment—a major policy issue in the past—was addressed in the Maputo Declaration, which fixed 10 percent as a target for agricultural public expenditure’s share of total government expenditure. (Green Revolution Asian countries sustained levels above 10 percent for as long as a decade during their most robust agricultural sector transformations.) The adoption of this target was useful as a clear statement of intent, although it has not been met in many countries, and several countries that have exceeded the 10 percent target have done so with imbalanced expenditure composition (e.g. high budget allocation to input subsidies) that will not sustain sector performance. Continent-wide tracking of SSA countries’ progress on improving agricultural public expenditure remains weak, but is being developed through the Strategic Analysis and Knowledge Support Systems program with IFPRI support.

5.6

Private Sector Interest Is Up

Stronger demand, higher prices, better macro and sector policies, as well as an improved overall business climate create the opportunity for higher returns to agriculture in Africa, inducing increased investment from home and abroad. Foreign capital (including repatriated funds that previously fled Africa for safer havens) is beginning to flow into African agriculture and related value chains, as evidenced by much recent activity, including the Chinese acquisition of land leases in Tanzania and the Democratic Republic of Congo, rising interest on the part of European energy firms in securing land concessions for biofuels feedstock production, and surging foreign investment in high-value African agricultural export enterprises. One recent survey of press reports found that around two-thirds of the expressions of interest in land purchases worldwide were related to land in Africa (Deininger et. al. 2011). The African Union (AU) and World Economic Forum (WEF) launched the Grow Africa program under the CAADP umbrella in 2011 with the aim of promoting private sector investments in African agriculture. Following the first investors' forum in 2012, 70 companies signed memorandums of understanding totaling US\$3.5 billion in investments.

5.7

Technology is Facilitating Reforms, Improving Information Flows, and Lowering the Cost of Doing Business

Technology is reducing the cost of implementing needed reforms, especially in land administration. Following in the footsteps of other developing countries in some cases, a growing number of SSA countries have piloted fast, effective and low-cost approaches to register and administer land, often with significant positive impacts on investment and gender equity. These experiences set the stage for more widespread reforms that would improve the functioning of land markets, with concomitant benefits, including unlocking financial markets. Examples include:

- Using a model similar to that employed by Vietnam in the 1990s, Ethiopia issued certificates for 20 million land parcels at a per-unit cost of less than US\$1 and is piloting a cadastral index map that costs less than US\$5 per parcel. Its total cost of registration is well below that of comparable countries (US\$20).
- Rwanda is completing a nationwide program to issue land titles (with a photomap) at less than US\$10 per parcel. The approach is similar to Thailand's successful 20-Year Land Titling Program, but is faster and cheaper, as it is based entirely on a photomap to provide the spatial framework.

- Côte d'Ivoire, Benin and Burkina Faso have been piloting rural land tenure maps to register individual and communal lands.
- Tanzania has surveyed almost all of its communal lands; around 60 percent have been registered, at an average cost of roughly US\$500 per village. Mozambique and Ghana are poised to scale up their communal land registration pilots. Mexico's successful registration of its communal lands (*ejidos*) during the 1990s was a relevant source of positive lessons for SSA countries.
- Ghana reduced the number of days to transfer property from 169 in 2005 to 34 in 2011 and increased land-related revenue from US\$12 million in 2003 to US\$132 million in 2010 thanks to improved computerization of its land registries, reformed land information systems, and strengthened property valuation.
- Following Brazil's successful model of market-assisted land reform, Malawi successfully piloted a community-based willing-buyer/willing-seller approach to land reform benefitting more than 15,000 poor farm families. Agricultural incomes increased by 40 percent per year, and the pilot had an economic IRR of 20 percent.

The spread of information technology is also helping to resolve some of the problems that have plagued agricultural development in the past. Farmers are becoming better informed about market conditions, and logistics costs are decreasing (see Box 1.) The World Bank has been working to take advantage of all possible opportunities to mainstream these advances in its projects.

Box 1: The Role of ICT in Agriculture

Information and communications technology (ICT) is no longer a luxury in Africa. With some 68,000 km of submarine cable, over 615,000 km of national backbone networks laid over the past few years, and almost 650 million mobile phone subscriptions, Africans have begun to leverage new technologies and innovations in their daily lives. Moreover, many of the innovations are homegrown in Africa and are bringing efficiencies to the agricultural value chain.

The agricultural value chain on your mobile phone.

More than two-thirds of Africans rely on agriculture for a living, yet because of the lack of complete information, high transaction costs, and inefficient value chains, farmers, intermediaries, and buyers are unable to effectively collaborate in the fragmented market. In Kenya, Pride of Africa's DrumNet Project is tackling this challenge by providing an integrated platform that uses various ICTs—including mobile phones—to provide producers, suppliers, traders, and financial service providers with an end-to-end solution to procuring inputs, linking producers to buyers, and finalizing credit and payments. At harvest, DrumNet franchise representatives coordinate produce aggregation, grading, and transportation to market. The pilots have been

implemented in five different Kenyan provinces and are reported to have involved over 4,000 small-scale farmers. They are partnering with Kilimo Salama, a micro-insurance service provider that uses the service provider M-PESA to provide payouts to smallholder farmers whose crops fail. In its second year of operation, 12,000 farmers were insured, 10 percent of whom received payouts of up to 50 percent of their insured inputs.

In Rwanda, eSoko, which was established under a World Bank project, is bridging the critical information gap between rural producers and local markets by providing up-to-date information about market prices for essential commodities via their mobile phones. Rolled out in 2009, the application has given farmers improved access to markets, leading to less produce waste and higher earnings. The application also provided users information on effective farming techniques. The Ministry of Agriculture collects data on various products in 62 markets that subscribers can access by sending an SMS to 7656, at a cost of RF 10. eSoko was awarded the Technology in Government in Africa (TIGA) award in 2011.

ICT applications for agriculture and rural development have generally not followed any generic blueprint. They are usually designed locally and for specific target markets, with localized content specific to languages, crop types, and farming methods. Further, as the price of ICT devices such as smartphones and tablet computers decreases, they will become more readily available in African markets, opening new doors for innovation and greater impact on producers and agricultural markets.

Source: Adapted from eTransform Africa <http://go.worldbank.org/CXS4GFJDE0>, Maximizing Mobile <http://go.worldbank.org/0J2CTQTYP0>, and an online article on eSoko <http://www.newtimes.co.rw/news/index.php?i=15246&a=63130>

5.8

The Groundwork for Making Agriculture More Climate-Smart Has Been Laid

Climate resilience must be one pillar of technology development going forward. Agriculture will be the sector most directly affected by the warmer temperatures and more common extreme events (floods and droughts) that climate change will bring. Under CAADP, draft frameworks have been adopted for developing and financing initiatives to mainstream climate-smart approaches into country-level plans, programs, and policies. Climate-smart agriculture (CSA) is about strengthening farmers' resilience to climate change, while at the same time reducing agriculture's climate imprint by curbing greenhouse gas (GHG) emissions through the reduction of deforestation and increase of carbon storage, including in the soil. Climate-smart agriculture relies on the limitless ingenuity of farmers, and includes proven techniques such as mulching, and developing drought- or flood-tolerant crops to meet the demands of a changing climate. But CSA is also about weather forecasting,

early-warning systems and risk insurance. Finally, CSA seeks to highlight changes in policy that will help farmers adapt and succeed.

A key component in developing effective strategies to cope with climate change is better water management, which can be achieved by expanding irrigation schemes and making them more efficient. For rain-fed agriculture, another component will be adopting improved land management practices and undertaking appropriate investments. This can improve outcomes by increasing the ability to adapt to a changing climate and building resilience to climatic variations. The adoption of farming systems capable of increasing concentrations of soil carbon can achieve the kind of “triple win” recently emphasized by the World Bank⁵ related to: (i) increased land productivity through more organic soil carbon, (ii) increased water retention of soils with higher carbon levels for better climate resilience, and (iii) reduced GHG emissions through more efficient fertilizer use and by increasing agriculture’s role as a carbon sink. With respect to lowering GHG emissions, reducing deforestation by sustainably intensifying agricultural production will be key, since over 60 percent of Africa’s GHG emissions come from land and forest degradation (World Bank 2009). Improvements of livestock management will also be very important, especially for controlling methane. Given the knowledge-intensive nature of many practices underlying climate-smart agriculture, significant improvement of the effectiveness of agricultural extension systems is needed.

⁵ See, e.g., <http://climatechange.worldbank.org/content/climatesmart-agriculture-and-world-bank-facts>; http://www.profor.info/sites/profor.info/files/CSA_Brochure_web_WB.pdf



Working in the field. Ghana. Photo: Curt Carnemark / World Bank

6 Many Challenges Lie Ahead

To take advantage of the opportunities created by these developments, many challenges must first be addressed.

6.1 Enhancing Irrigation Capacity Will Require Policy Reforms and Good Project Preparation to Meet Social and Environmental Challenges

Improving water availability and management is the key to increasing yields and resilience to the vicissitudes of climate change. Yet currently, water use efficiency is low and maintenance of infrastructure is poor. Better management will come only with the improvement of policies related to water cost recovery, as well as with the development of institutions, such as water user organizations. Preparation of large irrigation projects is expensive given the technical challenges that require costly engineering and because these projects typically raise environmental and social issues, which must be resolved. Such challenges have discouraged many potential investors in the past. New tools for mitigating these risks are now available, however, and can be brought to bear in the future.

6.2 Land Policy and Administration Investments Will Need to Address Social Concerns, Capacity Constraints, and High Preparation Costs

The downside of the increasing interest in agricultural investments is the threat of “land grabs.” Millions of hectares (at least 1 million each in Ethiopia, Liberia, Mozambique, and Sudan) have been claimed by investors; and in some cases poor governance has led to violations of principles for responsible agro-investment and dispossession of local communities. This threat is amplified by the fact that less than 20 percent of occupied land in SSA is registered; the rest is undocumented, informally administered and thus vulnerable to land grabbing and expropriation without adequate compensation—especially for women, who are often disadvantaged by cultural practices. Another challenge that must be overcome is the inefficiency of land administration in Africa. It takes twice as

long (65 days) and costs twice as much (9.4 percent of property value) to transfer land in SSA than in OECD countries (31 days; 4.4 percent). The high stakes in land transactions are also a magnet for corruption. A recent study in 61 countries by FAO and Transparency International highlights the fact that weak governance has increased the likelihood of corruption in land administration.

All of these problems are magnified by the low capacity and demand for land administration professionals. Ghana, Kenya and Uganda each have fewer than 10 professional land surveyors per 1 million, versus 197/million in Malaysia and 150/million in Sri Lanka. Even these are underemployed: of Kenya's 206 registered land surveyors, only 85 are practicing. A final challenge is that preparation of land administration projects is comparatively costly and slow. Careful study and consultations on sensitive policy and institutional aspects are required, and addressing technical, economic and safeguard issues create added costs over and above the standard costs for many other kinds of projects.

6.3

Policy-induced Barriers and Poor Transportation Infrastructure Fragment Markets

Market access and trade within and outside the region are greatly impeded by a number of policy-induced barriers on top of the poor transportation infrastructure. Among the problems documented in a recent study (World Bank 2013) are lack of harmonization of standards; long delays crossing borders and sometimes outright harassment of traders; internal roadblocks, which are at least time-consuming and often involve payment of bribes; and erratic ad hoc government trade policies and interventions in markets, which make arbitrage risky. One study quantifying the costs of border barriers estimates that, when crossing between DRC and Rwanda, these barriers represent the equivalent of adding 1600 km to the trip. (World Bank 2013). Another estimate is that non-tariff barriers such as sanitary and phytosanitary measures and quantitative restrictions may raise the price of food staples in Africa by around 34 percent (World Bank 2012). These barriers fragment natural "marketsheds," preventing the connection of food surplus and food deficit regions, reducing the welfare of both, and increasing reliance on external markets (Haggblade 2013).

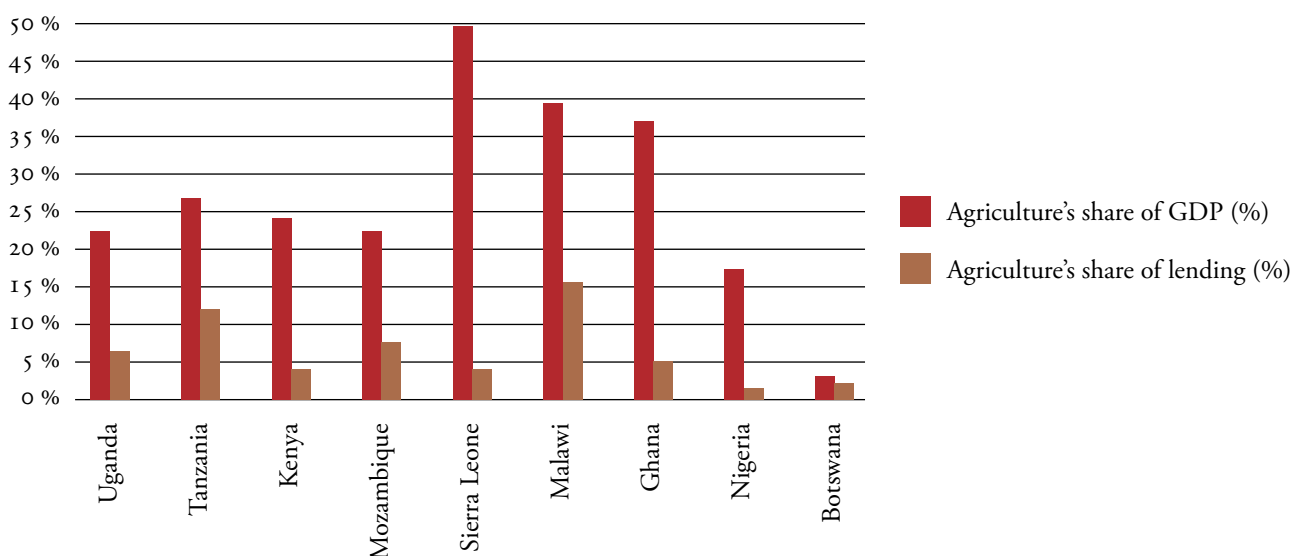
For exports to high-income markets, an additional problem is meeting advanced standards of quality and certification requirements. A few of the vegetable exporters in the major exporting countries such as Kenya, Senegal, and Zambia have advanced certification, but many other potential exporters across the continent do not and are consequently unable to access these markets. Certification costs are an especially high hurdle for small producers (World Bank 2012, World Bank 2013).

6.4

Financial Markets are Underdeveloped with Little Commercial Lending to Agriculture

Financial markets in general are underdeveloped in Africa, but this is particularly true of agricultural finance. Low profitability, perceived high risk, and lack of good collateral make the agricultural sector a rather poor client for lending, from the perspective of financial institutions. As a result, there is little commercial finance flowing to the sector. Its share in bank lending is disproportionately small, relative to agriculture's share of economic activity in all countries in the region (Figure 8).

Figure 8. Share of Commercial Banks' Lending to Agriculture Relative to Share of Agricultural GDP



Source: World Bank 2013, from UNIDO 2010.

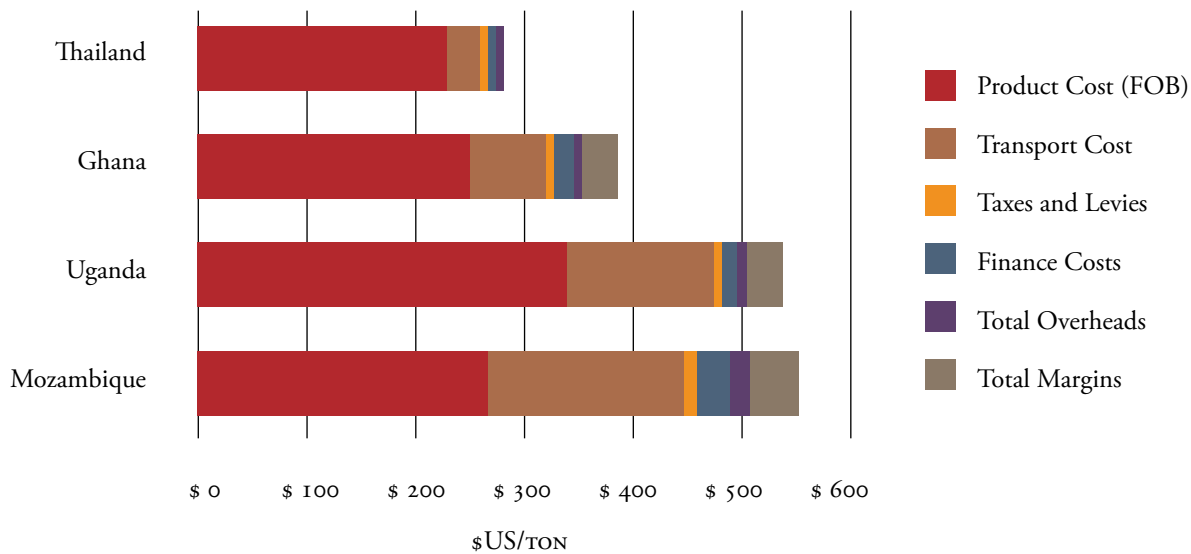
6.5

Costs of Productivity-enhancing Inputs are Very High

Lower fertilizer use in Africa than in other developing areas is in part due to its higher cost in this region. According to FAOSTAT figures, the price per metric ton of nitrogen is around US\$500 in Brazil. The only African country with a price that low is Kenya. In other African countries, nitrogen costs more than half again as much, sometimes much more. In Burundi, the price is over US\$2,500

(World Bank 2013). Tendering processes, and in some cases, exclusion of foreign companies from importation, reduces competition and adds opportunities for collusion and corruption. In one West African country, it is estimated that corruption adds as much as 20 percent to retail prices. Some countries (Ethiopia, for example) still depend largely on the state to import and distribute fertilizer, with the inefficiencies that entails.

Figure 9. Fertilizer Costs, Thailand and Three African Countries



Source: World Bank 2013, from IFDC and Chemonics.

A detailed analysis of the value chains for fertilizers in several African countries and Thailand demonstrated that, while the product cost was similar in all, the African countries had higher additional costs of distribution, especially related to transport (Figure 9). This reflects the lack of good transportation infrastructure and may point to other problems in that sector, such as regulatory red tape or a lack of competition. Subsidy programs have been a common policy response to help farmers overcome this handicap, but these have often been managed in ways that undermine private initiative. Subsidized fertilizer is rationed and surveys have consistently shown that the recipients are biased towards farmers with above-average area and wealth. A further cost of the subsidy scheme is the late delivery of fertilizer to many farmers, leading to untimely application that reduces yields.

Regulatory barriers are also a problem with inputs. Even when seed policies are in place, they are often outdated, unduly rigid, and difficult to implement. Varietal release usually requires a long process involving two years of national performance trials and two years of Distinctness, Uniformity and Stability (DUS) trials, even when breeders have extensively tested a variety or if the same variety is being imported from a neighboring country. After a variety is approved for release, it may take up to 10 years for seeds to become available to farmers in significant quantities. Seed certification

is compulsory in most countries, although no country in Africa has the capacity to implement the regulation, and in any case, there is no reason to restrict farmers' choices to certified seed. National policies are not harmonized across countries, leading to small, fragmented markets that discourage seed companies from making the necessary investment in time and testing costs to enter. Even where agreements have been made to harmonize seed policy—as in the case of ECOWAS—little concrete progress has been made to date. Investors from the sector interviewed for a recent report were unanimous in their call for more streamlined and flexible seed policies. A review of maize varietal releases in 13 countries found that, of the 250 varieties and hybrids (excluding South Africa) that had been released during the period 2002–06, most activity focused on Kenya, Zambia and Zimbabwe, which have reasonably-sized markets and where there has been at least some progress in policy reforms. In other countries of the region that have yet to implement needed policy reforms, there was little private sector activity. In cotton, having an appropriate regulatory environment was important in establishing the Burkina private sector's leadership in genetically modified cotton for the region, although Africa still seriously lags behind other regions. A recent review sponsored by the Gates Foundation found that policy and regulatory barriers have been responsible for reducing the technology options imbedded in inputs that are available to African farmers (Pray, Gisselquist, and Nagarajan 2011). Clearly, regulatory reform will need to be an integral component in the agenda to improve farmers' uptake of better production technologies.



Women take a break after harvesting. Kenya.
Photo: Curt Carnemark / World Bank

7 Working with Africa to Improve the Performance of its Agricultural Sector

7.1

The World Bank is responding with renewed commitment to meet these challenges and take advantage of related opportunities

The World Bank is scaling up its analytical work. Recognizing that, to make the best use of available resources will require that the effort be informed by the best analytical foundation possible, the Bank has significantly scaled up its knowledge work in agriculture in general and in African agriculture in particular. An evaluation of the Bank's assistance to agriculture in Africa by the Independent Evaluation Group (World Bank 2007) raised the alarm that not only the Bank, but also other donors and governments had been paying insufficient attention to the sector, and made a number of concrete recommendations for redressing this imbalance, including increasing the quality and quantity of analytical work. This was followed by the World Development Report of 2008, *Agriculture for Development*, and a series of regional flagship publications that have (i) extracted lessons from other countries with conditions in many ways similar to those present in Africa, particularly Brazil and Thailand, which have successfully led the way in creating a successful agribusiness sector (Morris et al. 2009); (ii) focused on how to break down barriers to regional trade in Africa (World Bank, 2012) and take advantage of growing opportunities in global and regional markets (World Bank 2013); and (iii) collected information related to best practices to scale up successful experiences in land policy and administration (Byamugisha, 2013, forthcoming).

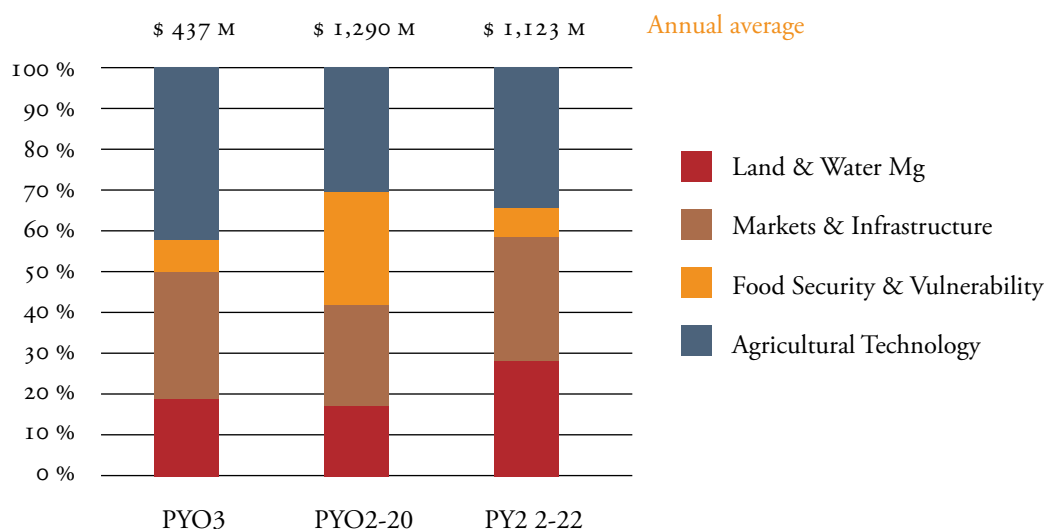
The Bank is undertaking Agriculture Public Expenditure Reviews (AgPERs) in many countries to improve the quality of public spending in the sector. With the assistance of trust fund resources, the World Bank is facilitating analytical work on public expenditure across SSA. This program typically starts with a basic, diagnostic AgPER, and then moves to more specialized analysis, such as sub-sector expenditure impact evaluation, expenditure tracking, and medium-term expenditure framework development. The program initiated work in a first cohort of countries in 2011, has a second cohort in process, and will include a third cycle before the program closes in 2013. By that time, at least 18 countries will have benefited from the review process. The aim of this phase of AgPE

support is to build consensus around budget choices, improve implementation, and strengthen monitoring and evaluation (M&E) as the basis for evidence-based budget allocation. For a growing number of countries, public expenditure analysis is being integrated into annual Joint Sector Reviews (JSR) conducted by Ministries of Agriculture with their main domestic constituencies and financing partners. The Bank supports JSR as coordination mechanisms, improving donor alignment around government priorities, and strengthening government systems that enable transitioning donor support from project to programmatic sectorwide approaches. Bank engagement in JSR is best conducted through decentralized staff, but transaction costs are high, and in some countries will be most successful if paired with sector DPOs.

The World Bank is rebalancing partnerships. In addition to the engagement with other development partners in the initiatives described above, including hosting the TerrAfrica and CIWA programs, the Bank has formed a strong partnership with regional institutions, particularly CAADP, and has aligned Bank lending and analytical activities with the four pillars of the CAADP. The Bank is hosting a multi-donor trust fund to support CAADP-related activities, which has so far made several grants to regional institutions devoted to improving strategic planning and implementation of agricultural investments at national and regional levels. With the AU and the WEF, the Bank is focusing on catalyzing private investment via the Grow Africa initiative. And at the country level, decentralization of staff has facilitated coordination through agriculture donor working groups.

The Bank lending program is expanding. There has been a very significant scale-up in agricultural lending, from US\$0.4 billion in 2008 to US\$1.2 billion/year in FY11/12, with thematically varying composition (Figure 10). The lending has always been aligned with the CAADP pillars, but projects classified as food security and vulnerability have become less common in recognition of the fact that many other projects—in particular those aimed at improving natural resource management—make a strong contribution to enhancing food security and reducing vulnerability. The irrigation business plan for FY08-FY12 tripled irrigation-related lending. Furthermore, the composition of projects by type of instrument has become more diverse in order to meet changing needs, with more multi-sectoral, sector DPO, PPPs, regional, and programmatic designs than in the past.

Figure 10. Portfolio by CAADP Thematic Area
Aligned with CAADP Pillars with Changing Composition Over Time



Food security response shifting to fundamentals: soil and water management, markets, technology

7.2

The World Bank Now Has Medium- and Long-term Transformative Targets, with a Strategy for Attaining Them

Transformational impact requires delivering simultaneously on productivity growth, market connections and resilience enhancement through three channels. The first is support for critical, core public goods, including: (i) an enabling sector policy environment and public expenditure framework; (ii) better agricultural research and extension; (iii) improved land administration; and (iv) an efficient regulatory framework for food safety. The second is facilitation of private sector investments in agriculture, focusing on agribusiness and value-chains development, promotion of PPPs in agriculture, and development of a rural road network to better connect farmers to markets. The third channel is mainstreaming of climate-smart agriculture through rehabilitation and expansion of irrigation networks, enhancement of agricultural risk management, and sustainable water and land management, with a special focus on dryland areas. The mix of instruments would need to shift towards more programmatic approaches, with 30 percent of new lending consisting of agricultural development policy operations (AgDPOs) and sector-wide approaches (SWAp). African countries through CAADP would be in the driver's seat when it comes to implementing sector investment plans, which may be supported with SWAp operations. The medium-term plan is

to scale up Bank lending in the sector to about US\$3 billion/year, with ambitious targets in the five thematic areas of irrigation, land, technology, market access, and finance.

7.2.1

Improving Access to Water: doubling irrigated area

This would mean increasing the irrigated area from the current 20 percent to 40 percent of potential area by 2030. According to the CAADP Program for Investment in Agricultural Water, specific objectives by 2030 would include 3 million hectares of new irrigated land (0.7 million large-scale and 2.3 million small-scale). In addition, there is scope for rehabilitation of about 2.3 million hectares of large-scale schemes and development of soil and water conservation (water harvesting, wetlands and inland valley bottoms) on more than 10 million hectares. These targets are reachable, provided that some requirements are met, including addressing constraints on absorptive capacity. The corresponding investment cost is roughly estimated at US\$40 billion, of which the Bank could potentially finance 25 percent. This includes neither the cost of developing large multipurpose dams nor the cost of value-chain development and associated infrastructures such as access roads, which are expected to be financed separately. Single purpose water storage and diversion, however, is captured in this budget estimate.

This scale-up would require mobilization of a project preparation facility (PPF). The project preparation budget required to reach the irrigation area targets above amounts to about US\$900 million over 15 years. The bulk of the cost is related to undertaking the feasibility studies and engineering designs, as well as preparing the safeguard instruments. Quality is of the essence. Building the capacity of local engineering consulting companies through specific incentives and training programs will be key to establishing cost-effective irrigation services in developing countries. These costs are currently very high because most of the skills must be imported. In the initial years, the funds would be provided as grants to prime the process of preparation; the remaining portion could be provided on a rolling basis in the form of loans designed to prepare projects in phases. The timeframe for project preparation is typically three to five years and implementation requires, on average, seven to eight years. Based on these assumptions, it is expected that the grant PPF required would amount to one-quarter to one-third of the total preparation cost during the first 10 years (or about US\$30 million/year), after which it could be phased out.

Part of the irrigation development process will rely on the construction of multipurpose dams and on agreements reached for common use of shared resources in trans-boundary basins. It is therefore also necessary to foster the dialogue on integrated water management and on international waters. Joint projects between the Bank and other institutions to build multipurpose dams and monitor multiple uses of international waterways are critical. There are a number of ongoing Bank initiatives to support river basin development in the Niger Basin, Nile Basin, Senegal Basin and Zambezi Basin. The CIWA trust fund has been established to support the initial work on these types of river basin development programs.

A critically important component of the strategy is encouraging reforms of governance and irrigation policies, including cost recovery to ensure efficient use of water and maintenance and sustainability of infrastructure. The high-level dialogue on policy reforms and on private sector engagement could be established under the AU/NEPAD umbrella, using the newly established AgWA partnership as the vehicle, and could be supported with analytical work and policy-based lending. The partnership with AfDB would be expanded and strengthened with a view towards ensuring high-level dialogue consistency and harmonizing approaches at the country level.

Results targets by year 10 would include:

- A lending program on track to double irrigated area by 2030
- Generalization of efficient irrigation techniques and sustainability forced/enabled by cost-base pricing of water.

7.2.2

Solving the land bottleneck: from modest and fragmented to bold and systematic

The recent major pieces of knowledge work on land policy and administration and the pilot programs in several countries have laid the groundwork for a big push to scale up best practices. However, it has to be recognized that preparation of land administration projects is costly (US\$400,000 per project) and takes time (at least two years). A significant expansion of lending in this area will require the mobilization of a PPF for land administration investment preparation. The aim would be to strengthen the pipeline by preparing at least two new land projects per year for annual lending of at least US\$150 million, totaling at least US\$1.5 billion over 10 years. In addition to stand-alone land projects, land reforms could be combined with other objectives that are highly complementary in multi-sectoral pilots focused on developing mortgage finance markets (in collaboration with the Bank's financial sector unit) and land banking and leasing (with IFC); increasing irrigation investment by making land and water rights more secure; and slum upgrading through land tenure regularization, as is now ongoing in Kenya. DPOs would be an integral part of the strategy to facilitate important reforms. Possible candidate countries (and their potential areas of policy focus) would be Malawi (adoption of new land law), Mozambique (improved assessment of rural land tax), and Tanzania (effective implementation of land laws and policies).

Some target results by year 10 would include:

- Registration of secure titles on large areas of prime lands and communal lands
- Establishment of land data banks in countries with weak governance and physical land banks where governance is stronger
- Reduction of time to register property from 65 days to 30 days.

7.2.3

Access to markets: removing trade barriers and improving competitiveness

Development of regional markets will require removing many barriers to trade, both formal and informal. Through multi-sectoral efforts with the Bank's Poverty Reduction and Economic Management unit, the CAADP trust funds and other multi-donor trust funds will be mobilized to provide technical assistance to the regional economic commissions (RECs). These efforts would support the development of regional standards for food trade, private provision of certification, as well as the rationalization and harmonization of regulatory requirements for inputs. Both country and regional DPOs focused on these issues would support the reform agenda.

In addition to regulatory and institutional reforms, there is an urgent need to improve trade and transport infrastructure. Investments to increase storage capacity and establish sub-regional commodity exchanges could be expanded through PPPs. New information technologies would be used to disseminate market information, giving farmers and other market participants the information needed to negotiate on a more level playing field and to move products where they are most needed, as well as to efficiently arbitrate the large spatial price differentials that currently exist. Feeder roads, which are a major constraint to expanding trade in domestic and regional markets, would be built and improved using a decentralized approach.

Results targets by year 10 would include:

- Doubling of exports to markets outside Africa and in regional trade
- Cutting the cost of bringing farm produce to market by half
- Emergence of local brands to service regional markets.

7.2.4

Access to financial services: unlocking commercial lending and long-term financing

As noted above, only a small fraction of formal commercial credit goes to the agricultural sector, and lack of access to finance—especially long-term—is always identified as a key constraint to investment in the sector, particularly for those without connections to international agribusiness. All of the measures above aimed at improving the sector's profitability will make it a more attractive client from the perspective of financial institutions. Another key to unlocking this access will be reducing the risk, both real and perceived, of lending to the sector, by improving insurance and collateral instruments (e.g., by improving land security, developing warehouse receipts, and establishing commodity exchanges). Interventions to support the development of value

chains will also involve improving access to short- and medium-term finance, for example, through outgrower and contract farming schemes. The enabling environment for these developments lies in the public domain, and for this, the Bank will deploy knowledge-based instruments, including DPOs for policy reform. But finance itself is a private sector function, so much of this agenda will need to be tackled in conjunction with the IFC and with civil service organizations (CSOs) such as the Gates Foundation, which is sponsoring an initiative to facilitate the wider presence of financial institutions in rural areas.

Results targets by year 10 would include:

- Diversification of commercial bank portfolios into agribusiness
- Availability of long-term financing—e.g. for tree crops, irrigation, mechanization, storage and processing
- Expansion of financial services to include savings and payments
- Provision of financial services through ICT platforms.

7.2.5

Access to technology and inputs: reducing the yield gap by half by 2025 and making agriculture more climate-smart

One key element in the strategy to shrink the yield gap will be to increase the availability and reduce the cost of productivity-enhancing inputs through the measures described above. But much more is required to enhance the generation and uptake of technology in the region. The Bank will deepen the relationship with CGIAR centers to focus on technology relevant to African farmers and pursue South-South partnerships in an effort to transfer appropriate technology from similar agroecological zones (e.g., with EMBRAPA, Brazil’s agricultural technology agency). The West African Agricultural Productivity Project (WAAPP) has proven a very successful model for establishing regional cooperation in agricultural research, helping to overcome scale constraints and to encourage spillovers, so a key part of the technology generation strategy will be to expand this approach to other sub-regions, particularly southern Africa.

One priority item in the Bank’s support of technology generation and diffusion will be the mainstreaming of resilient and climate-smart agriculture, focusing on water management. Such initiatives will include irrigation and rainwater harvesting, agricultural risk management, conservation farming, and sustainable soils and land management. The aim would be to launch projects incorporating a landscape approach based on the recommendations and conclusions of the major ongoing flagship study on dryland areas.

The Bank will also deploy technologies aimed at reducing GHG emissions. A major pillar of the climate change strategy of the World Bank's Africa Region (World Bank 2009) is to assist African countries in taking advantage of opportunities to “do well while doing good” by reducing net GHG emissions and then selling these reductions in international carbon finance markets. Given the high share of emissions from land and forest degradation and deforestation in the region's emissions profile, it is clear that agriculture will play an important role here. In a significant development, a new, cutting-edge methodology has recently been approved by the Verified Carbon Standard (VCS) to measure and value carbon sequestered through the sustainable management of agricultural land. The VCS remains the gold standard in the voluntary carbon market, and the methodology gives project developers the opportunity to account for emissions reductions from improved management of land. The quantified carbon can then be sold on the voluntary market on behalf of farmers to generate additional revenues.

Results targets by year 10 would include:

- Cut current yield gaps in half
- Establish a dynamic and growing private input supply sector and dynamic sub-regional seed markets industry to more rapidly spread use of improved varieties
- Secure a larger role for biotechnology
- Ensure wider use of ICT in knowledge transfer.

7.2.6

Reaching these targets will require increased commitment for project preparation

Moving forward in these areas will require increasing private sector investments in agriculture through facilitation and fostering of PPPs. In view of the long gestation period required to bring projects to implementation readiness, there is need for a dedicated PPP project preparation facility in agriculture. Under the New Alliance Initiative adopted by G8 in 2012, efforts led by USAID are ongoing to set up a Fast Track Facility for this purpose. The Bank has been providing advice about the governance structure of this Facility and suggesting ways in which to align it as closely as possible with CAADP. To the extent that this Facility would be capable of mobilizing resources from traditional donors as well as from the private sector, there is a strategic interest that the Bank remain a close and constructive partner in this initiative as a pathway for further scale-up of its engagement in African agriculture, while leveraging private sector investments through PPPs.



Handful of peanuts. Mali. Photo: Curt Carnemark / World Bank

Annex: World Bank Action Plan Summary Matrix

	Now	Year 1	Year 3	Year 10 (results)
Water	Only 20% of potential Inefficient water use Private sector interest	Preparation facility Investor engagement Ensure lending quality	Launch large projects Water policy reforms Support to supply industries	40% of potential Sustainability through cost based pricing
Land	Costly lengthy risky “Land grab” risk Land AAA under way	Pilots (with irrigation) Land administration preparation fund	Large standalone projects Land set aside for youths Leverage IT (e.g. GPS)	Land (data) banks Secured titles, prime & communal lands
Markets	Imports to cities Intra-trade barriers High export standards	RECs initiative Reforms with DPOs Storage capacity (PPP)	Regional food standards Decentralized feeder roads Market information on-line	Doubling of exports Declining share of imports
Financial services	Little bank lending Insurance pilots Agfin initiative (Gates)	Agrifinance AAA Warehouse receipts & leasing frameworks	Credit lines (with IFC) Catalytic funds Commodity exchanges	Commercial bank lending unlocked Long term financing
Technology / Inputs	Low usage/yields Govt crowding out Small markets	Partnerships – e.g. CGIAR and Embrapa Reforms with AgDPOs	Leverage biotech and ICT Support to private input industries (e.g. PPPs)	Yield gap halved Competitive varieties Climate smart technologies widely adopted
Knowledge (cross-cutting)	Sleeping Giant report Africa Can feed Africa Agribusiness Report	Benchmarking to identify opportunities and constraints	More benchmarking of value chains South South/peer learning	Fact based policy making
Capacity building	Weak capacity at all levels of government and little coordination	Case studies on institutional approaches	New approaches implemented as part of projects	Open and inclusive policy making Dedicated govt teams
Partnerships	Weak CAADP Donor fragmentation SD-FPD-IFC platform	CAADP strong in AU Multi-donor PPP facility	Relationships with bilaterals South South Grow Africa	Strong leadership from AU/CAADP supported by donors
World Bank Lending	\$ 1.2 bn	\$ 1.5 bn	\$ 2.5 bn	\$ 25 bn over ten years



Planting crops. Kenya. Photo: © Curt Carnemark / World Bank

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Man shows harvested corn. Kenya.
Photo: © Curt Carnemark / World Bank



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