

THE GROWING OPPORTUNITIES FOR AFRICAN AGRICULTURAL DEVELOPMENT

Hans P. Binswanger-Mkhize, Derek Byerlee, Alex McCalla, Michael Morris, and John Staatz

Conference Working Paper 16

Prepared for the ASTI/IFPRI–FARA Conference | Accra, Ghana | December 5–7, 2011

AGRICULTURAL R&D: INVESTING IN AFRICA'S FUTURE

Analyzing Trends, Challenges, and Opportunities

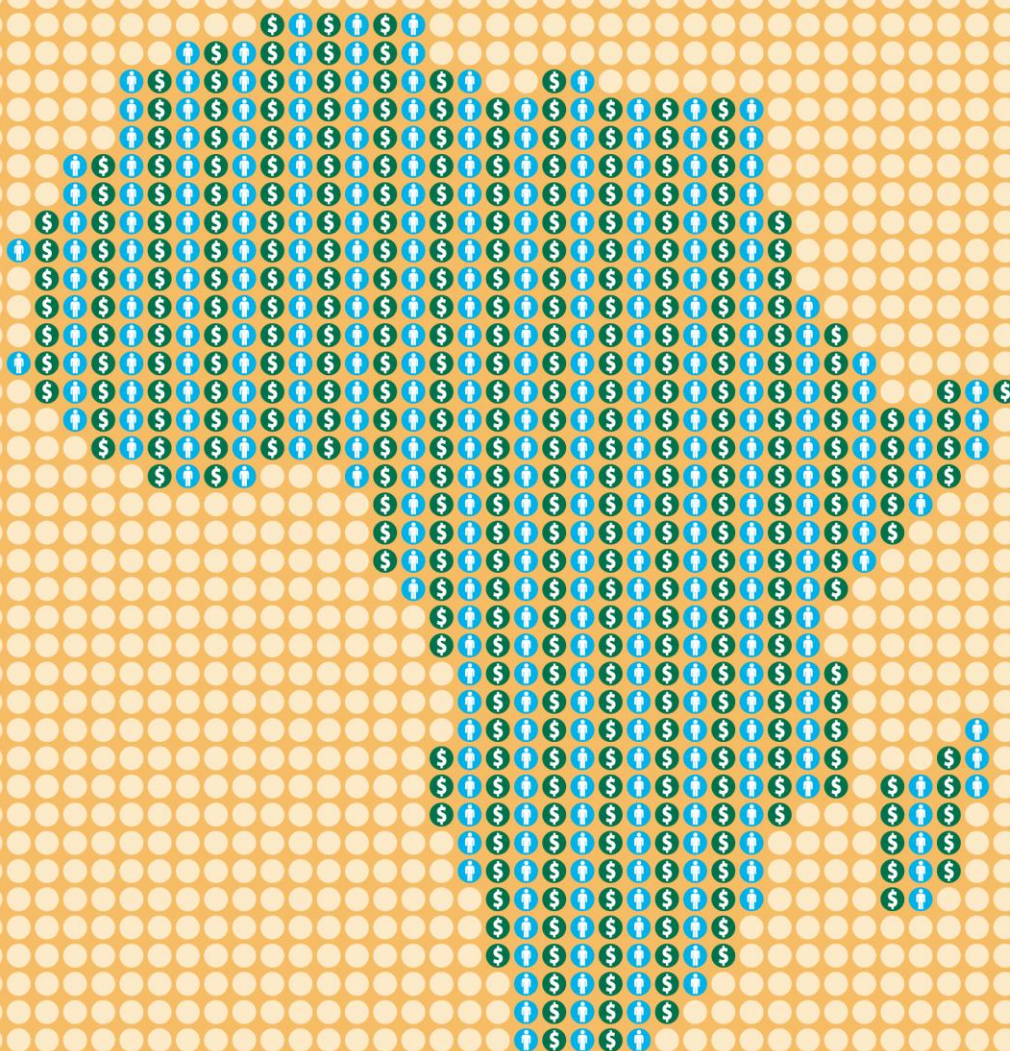


Table of Contents

1. Introduction.....	1
2. The Changing Context of and Prospects for African Agricultural R&D.....	1
A Legacy of Stagnation and Neglect	1
Winds of Change.....	2
African Growth and Agricultural Trends.....	5
The New Aid Architecture	6
The Capacity of Agricultural and Rural Institutions.....	7
Agricultural Incentives.....	8
The Future of Smallholder Farmers.....	8
The Imperative of Regionalization	9
3. Awakening Africa's Sleeping Giant	11
Study Approach and Methods.....	11
Findings from the Brazil and Thailand Experiences.....	13
Applying the Lessons in Africa's Guinea Savannah	13
Social Impacts of Agricultural Commercialization: Small Versus Large Farms.....	16
Potential Environmental Impacts of Agricultural Commercialization.....	17
4. Prospects for commercial agriculture in Africa	17
Constraints to be Overcome	18
Needed Interventions.....	19
5. Conclusion	20
References	22

List of Tables

1. GDP and agricultural GDP growth rates in Sub-Saharan Africa, 1990–2010	6
---	---

List of Figures

1. World Bank global price indexes	3
2. Real prices of all agriculture, energy, and fertilizer.....	3
3. Price changes in real terms, 2011–20 compared with 2001–10	4
4. The Guinea Savannah zone in Sub-Saharan Africa.....	11
5. Composition of farm-level shipment values	15

List of Boxes

1. A new take on “innovation” in Africa	8
2. Why Africa needs regionalization.....	10
3. Case study methodology	12
4. Indicators used to assess competitiveness	12

About the Authors

Hans P. Binswanger-Mkhize (binswangerh@gmail.com) is an adjunct professor at the School of Economics and Management of the China Agricultural University; **Derek Byerlee** is an independent scholar based in Washington, DC; **Alex McCalla** is Professor Emeritus at the University of California, Davis; **Michael Morris** is Lead Agricultural Economist at the World Bank; and **John Staatz** is a professor at Michigan State University.

Acknowledgments

Part 1 of the paper draws on the 2008 study, “The Changing Context for Agricultural and Rural Development in Africa,” which was sponsored by the African Development Bank and the International Fund for Agricultural Development as part of their joint evaluation of Agricultural and Rural Development in Africa. Parts 3 and 4 are the summary of the study “Awakening Africa’s Sleeping Giant: Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond,” which was sponsored by the World Bank, Food and Agriculture Organization of the United Nations, and the Government of Italy through its Ministry of Foreign Affairs. Support for this work by all these institutions is acknowledged with gratitude.

Acronyms and Abbreviations

CAADP	Comprehensive Africa Agriculture Development Programme
CAP	Common Agricultural Policy
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
IFAD	International Fund for Agricultural Development
NEPAD	New Partnership for Africa’s Development
OECD	Organisation for Economic Co-operation and Development
R&D	research and development
SSA	Sub-Saharan Africa

Abstract

After a decade-long period of stagnating or declining per capita incomes and agricultural output, Africa has entered a period of fairly rapid economic and agricultural growth. Macroeconomic stability, improved investment climates, and agricultural incentives—as well as decentralization of rural governance and greater community participation—have contributed to the improved trends. Rising international agricultural prices and expanding market opportunities within Africa will make farming more profitable and create great opportunities for African agriculture to make up lost ground, especially in domestic and regional markets. Challenges for further acceleration of agricultural growth are remaining discrimination against agricultural exports, the (still) poor investment climate, poor infrastructure, and inadequate investment in agricultural research and services.

A particularly favorable opportunity arises in the enormous and underpopulated Guinea Savannas that stretch across the continent below the Sahel and down via East Africa to a Southern African belt stretching from Angola to Mozambique. Soils and climate are as favorable as in the Brazilian *Cerrado* and the Northeast Thailand—two zones that have become major international agricultural competitors over the past 50 years. African smallholders are able to produce commodities at costs as low as these two zones, and able to supply the growing domestic and regional markets, but constraints in the logistics and processing of agricultural commodities have so far prevented countries from becoming major exporters.

This paper examines how Africa can harness the enormous potential of its “Sleeping Agricultural Giant,” and how possible adverse social and environmental impacts and obstacles can be mitigated. An approach built on smallholder agriculture, with strong private investment in agro-industry, marketing and logistics, has the highest potential for contributing to social development and poverty reduction.

1. INTRODUCTION

Despite the continuing economic crisis, a sense of optimism prevails about prospects for Africa's agricultural and rural development. Economic growth in Sub-Saharan Africa (SSA) is expected to reach or exceed 5.5 percent (IMF 2011), and agricultural growth has also been strong—exceeding 3.5 percent, which is well above the population growth rate of about 2 percent. Although the region still ranks at the bottom in terms of its business climate, 27 of SSA's 47 countries implemented “Doing Business” reforms in 2010 (World Bank–IFC 2011), and SSA also continues to strengthen its regional and subregional institutions.

Agriculture had returned as a priority on the African development agenda even before the food price spike of 2008, and the second spike in 2011 further intensified interest. The African Union, in conjunction with the New Partnership for Africa's Development (NEPAD), is continuing to develop the Comprehensive Africa Agricultural Development Programme (CAADP) and is encouraging countries to allocate more fiscal resources to agricultural development. The recent sharp rise in international food prices increased poverty rates and food import bills in the short term, but—when combined with economic growth—higher prices also create opportunities in domestic, regional, and international markets, especially for farmers in regions with significant agricultural potential, such as the East African highlands and the Guinea Savannah zone.

The Guinea Savannah is an enormous expanse of arable land stretching across Africa south of the Sahara, then reaching down from Uganda to Mozambique, and westward into Angola via the Democratic Republic of the Congo and Zambia. Of the zone's 600 million hectares, some 400 million could potentially be used for crop agriculture. Less than 10 percent of this area is now cultivated, making it one of the largest underused agricultural land reserves in the world.

Two similarly underdeveloped and landlocked agricultural regions elsewhere in the developing world—the Brazilian *Cerrado* and the northeast region of Thailand—may offer an example of how the agricultural potential of the Guinea Savannah could be realized. These regions have similar agroclimatic conditions to those found in the Guinea Savannah, yet they have developed at a rapid pace over the past four decades, conquering important world markets. Their successes defy the many skeptics who asserted that the challenging agroecological characteristics, remote locations, and high levels of poverty would be impossible to overcome. Similar perceptions fuel pessimism about the prospects for African agriculture in general and the Guinea Savannah in particular.

This paper examines prospects for “awakening the sleeping giant” that is Africa's agricultural sector and achieving successes similar to those in Brazil's *Cerrado* and Northeast Thailand. The paper draws on a recent World Bank (2009) study “Competitive Commercial Agriculture for Africa,” which suggests that rapid growth could be brought to African agriculture with the development of a dynamic commercial agricultural sector.

2. THE CHANGING CONTEXT OF AND PROSPECTS FOR AFRICAN AGRICULTURAL R&D

A Legacy of Stagnation and Neglect

Except for North Africa and select SSA countries that have attained middle-income status, economic growth in Africa has been slower than anywhere else in the world. Low investment and slow productivity growth have meant that, rather than improving over the past five decades, poverty and hunger have deepened in SSA. Where economic growth has improved, poverty has declined, but it is only where agricultural growth rates have also increased that hunger has been reduced. Growth rates have been slowest in landlocked, resource-poor countries. A long-term cause of sluggish growth was very high population growth, which led to very high dependency rates throughout Africa. Poor

governance, macroeconomic instability, and limited integration into global markets are other factors that stood in the way of growth until the mid-1990s, when things started to improve. Today these issues are less of a factor, and structural impediments have become the main obstacles to growth. Infrastructure in terms of roads, electricity, water supply, communications, and so on is poor; transport costs are high; and the cost of doing business in Africa is much greater than in other parts of the world. Financial markets in general and rural finance in particular are weak, and savings rates are much too low.

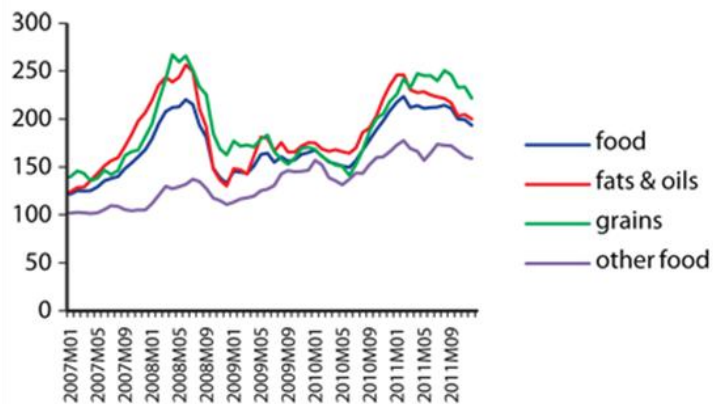
Agriculture in much of Africa has long been discriminated against via macroeconomic, trade, and agricultural policies, and starved of fiscal resources. Even at the height of donor support to agriculture in the 1980s, apart from often being poorly designed, foreign aid was insufficient to compensate for these negative policies and the lack of domestic resources. Dramatic reductions of donor support to agriculture in the 1990s and the early years of this century exacerbated the problem. This combination of negative factors has prevented agriculture from making the contributions to growth and reductions in poverty and hunger that have been so powerfully felt in East and South Asia.

Winds of Change

Global winds of change have brought opportunities for African agriculture, for example, through the biotechnology revolution and, in the longer run, the potential for the production of biofuels. But they have also brought threats, such as climate change and the failure of the Doha Round of trade negotiations to start dismantling the Organisation for Economic Co-operation and Development's (OECD's) agricultural subsidies and trade barriers. The global talks on climate change, the latest of which took place in Cancun in 2010, promised support for climate-related mitigation and adaptation measures. However, actual mechanisms and funding are still far away. Other challenges to African agriculture are the dramatic changes under way in the consolidation of international agribusiness firms and the associated supermarket revolution. In SSA, these processes have so far been driven by African players. The privatization of much of agricultural research as a consequence of the biotechnology revolution is also affecting agriculture in Africa.

After three decades of declining and depressed agricultural commodity prices, international agricultural prices peaked twice in the past three years (Figure 1). Grain and oilseed prices shot up in 2007, peaked in early 2008, and then declined, only to rise again as part of a broader set of price increases. In mid-2011, maize prices rose above their 2008 peak. In February 2011, the Food and Agriculture Organization of the United Nations' (FAO's) food price index reached an all-time high, retreating only by 4 percent by June. Figure 2 plots the longer term trend and forecast for real agricultural prices alongside the prices of the two primary material inputs to agriculture: energy and fertilizer. Real prices of all agriculture (food, beverages, and agricultural raw materials) are expected to drop gradually and stabilize at a level about 40 percent higher than in 2000.

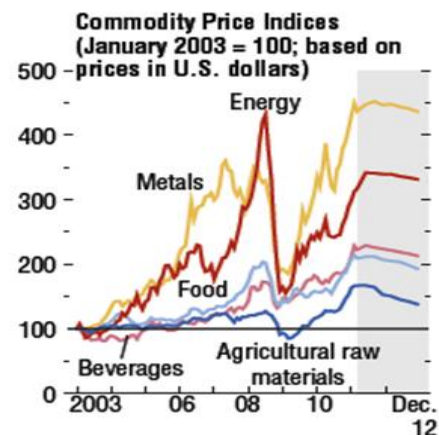
Figure 1. World Bank global price indexes



Source: World Bank (2011).

Note: Nominal U.S. dollars prices; 2000 = 100.

Figure 2. Real prices of all agriculture, energy, and fertilizer



Source: IMF (2011, Figure 1.21).

Rising food and agriculture prices have been driven in part by structural changes in supply and demand conditions. On the demand side:

1. Rapid economic growth and rising incomes in emerging economies, such as India, China, and Southeast Asia, and more recently in Africa, have increased the rate of global demand expansion. This factor was dampened by the global economic crisis for almost two years, but is back in full force.
2. Population growth has continued at a fairly rapid pace in South and Southeast Asia and in Africa.
3. Urbanization and global growth have spurred demand for a larger and more varied food supply.
4. Throughout the first decade of this century, OECD countries expanded their biofuel mandates. These targets are being met with conversion to ethanol of sugarcane (especially in Brazil) and maize (especially in the United States) and with the conversion of oilseeds into biodiesel (especially in Europe and Southeast Asia). Even in the face of rising food prices, biofuel mandates have been maintained or increased. This is a major reason why food and oil prices are moving together, alongside the fact that prices of fertilizers, especially nitrogen fertilizers, are highly correlated with oil prices.

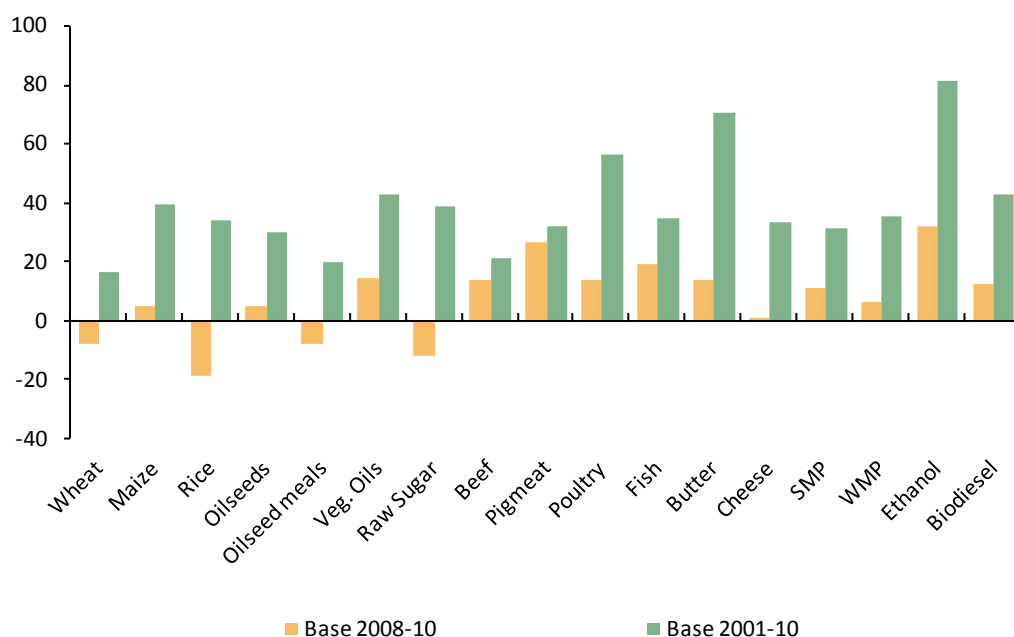
On the supply side, the main structural factors are five:

1. Rates of investment in agriculture had declined throughout the world (Fuglie 2008), slowing global supply growth (there are signs of a rebound with the onset of higher agricultural prices).
2. Increased competition for water and land has dampened agricultural growth.
3. Investments in agricultural R&D have declined everywhere.
4. Higher petroleum prices have permanently increased the costs of agricultural production.
5. Some believe that the ultra-low interest rates that persisted throughout much of the first decade of this century—up to this day—encouraged speculators to become active in futures trading in agricultural markets. However, while this may have exacerbated the peak of 2008, it cannot explain the peak in 2011, and it is unlikely to affect food prices on a permanent basis.

Due to these trends on both sides of the supply and demand equation, global grain consumption exceeded production in six of the first eight years of the past decade. The outcome has been a drawdown of stocks to critically low levels. Combined with weather shocks and the surge in biofuel production, rising prices were the result, first in 2007/08 and again in 2010/11.

OECD–FAO (2011) expects real agriculture and food prices to retreat from their current highs by 2013 but to remain higher than in 2000–10 (Figure 3). Maize, vegetable oils, sugar and biodiesel are expected to remain about 20 percent higher than in 2000–10, while oilseeds, pig meat, and skim milk powder are expected to stabilize at about 10 percent higher. The largest price rises are expected for poultry (34 percent), butter (42 percent), and ethanol (55 percent), and these increases will likely persist over subsequent decades as well.

Figure 3. Price changes in real terms, 2011–20 compared with 2001–10



Source: FAO–OECD 2011.

A long-term trend of rising real prices is therefore replacing declining and low agricultural prices. Much higher real prices are also expected to prevail for the two key inputs to agriculture mentioned earlier, namely energy and fertilizers. Energy prices are now 250 percent higher than in 2000, though by 2020 they are expected to drop back to levels about 175 percent higher than in 2000. Fertilizer prices, now 170 percent higher than in 1990 and 2000, are expected to drop to a level about 80 percent higher than in 2000.

Because most African economies are open, international price increases are largely transmitted to the domestic economy. This effect has been evident in the worsening poverty caused by the recent food price spikes. Food-importing countries were hardest hit, as they have few ways to prevent international prices from being passed on to consumers. Within these countries, urban populations and those rural poor who are net buyers of food were most affected. Food import bills rose for all net food importing countries in Africa. Many of these countries were at the same time even harder hit by the rise in global energy prices.

As food prices settle back, commodities with a rising price trend could offer opportunities for African farmers, especially in domestic and regional markets that are growing due to rising incomes. In these markets farmers compete on the basis of import-parity prices rather than export-parity prices, which are lower. Equally important, products for markets close to home face fewer quality and phytosanitary barriers than those for export overseas. African farmers may thus have opportunities to re-conquer markets lost over the past decades. Internationally, the changing food demand and supply patterns are expected to lead to more South–South trade, boosting opportunities in domestic and regional markets. Of course, it is not yet clear whether African farmers will be able to seize these opportunities.

African Growth and Agricultural Trends

A set of factors now seems to be working in Africa’s favor. Since 2003, the number of armed conflicts in SSA has dropped from 15 to 4 and is now much lower than in Asia. (The conflicts that remain are in Senegal’s Casamance region, Somalia, Northern Uganda, and the Kivu region of the Democratic Republic of the Congo.) Better macroeconomic management has reinforced improvements in the business environment and brought about a more appropriate division of labor between the public and the private sector. As a result, fiscal deficits and inflation have come down and growth has accelerated. Advances in democracy, combined with stronger civil societies, communities, and farmers’ associations, have made governments more accountable to their populations. SSA has built stronger regional and subregional organizations, both at the political level and for agricultural research. Furthermore, new private funders and emerging-economy donors are providing growing volumes of aid.

Specific to the agricultural sector, several positive developments are notable. First, price incentives for producers have improved as a result of unified exchange rates, lower industrial protection, and sharply reduced export taxation. Second, the higher international commodity prices, which are likely here to stay, could create growing opportunities for import substitution and regional agricultural trade. Finally, African governments, the regional institutions, and development partners have shown, at least in words, increasing commitment for agricultural and rural development.

All of these positive trends have led to an acceleration of economic growth and, to a lesser extent, of agricultural growth (Table 1). The rate of economic growth for Africa as a whole rose to 4.6 percent from 2007 to 2010, while agricultural growth reached 3.7 percent.¹ Economic and agricultural

¹It matters whether economic and agricultural growth rates are calculated for the continent as a whole, or as simple averages of country growth rates. For example, for the 1990s the simple average rate of economic growth across countries is 3.1 rather than 2.1, suggesting that economic growth accelerated in the 1990s, rather than only in the last decade. On the other

growth persisted despite the economic crisis of 2007–08 (Table 1, last column). In fact, the last three years saw a quickening of the agricultural growth rate, apparently exceeding the growth rates of earlier decades by more than a percentage point.

Table 1. GDP and agricultural GDP growth rates in Sub-Saharan Africa, 1990–2010

Type of growth	1990–89	1990–99	2000–2009	2007–09/10 ^a
GDP growth	2.1	2.1	4.7	4.6
Agricultural GDP growth	2.6	2.5	3.1	3.7

Source: Calculated by authors from World Bank data.

a. GDP growth data are for 2007–09; agricultural GDP growth data are for 2007–10.

The countries with the fastest-growing economies have achieved reductions in poverty headcounts as well. Unfortunately, except in West Africa, these have yet to be translated into measurable reductions in hunger and malnutrition. There are also other areas in which progress has been less than satisfactory: the persistent HIV/AIDS crisis; the stubborn remaining armed conflicts; the lack of improvement in governance and decentralization; slow-paced regional integration and persistence of underfunded regional and subregional organizations; inadequate fiscal commitments to agriculture and rural development by national governments; and slow progress in infrastructure linking landlocked countries and remote regions to the centers of demand and harbors.

Impediments remain for agricultural growth as well. Financial markets and rural finance institutions are weak. Development of competitive output and input markets has lagged, and services for smallholders remain poor. Competition for natural resources—soil, water, fisheries, and forests—is increasing, and management of these resources is improving only slowly, if at all. Progress in biotechnology is inadequate and agricultural research, agricultural extension, and institutions of higher learning remain persistently underfunded. These factors threaten to condemn African agriculture to slow and inadequate technical change, contributing to a growing technology divide. Africa will have to address these issues if it is to capitalize on today's better agricultural opportunities.

The future agenda of all players must focus in particular on shared growth that includes rural areas. Ndulu et al. (2007) sum up the needed medium-term growth strategy as follows: improving the *investment* climate, closing the *infrastructure* gap with other regions of the world,² focusing more on *innovation* to power productivity growth and competitiveness, and building *institutional* and human capacity.

The New Aid Architecture

Stagnant aid from traditional donors combined with lagging national financial commitments for agriculture and rural development have persistently constrained Africa's agricultural development. In general, African countries have placed far more faith in donor support for their agricultural programs than has been warranted based on (1) the past volume and quality of aid, (2) donor specialization and coordination, (3) follow-through on aid commitments, and (4) the only modest improvements in donor behavior in recent decades. The growing fiscal space arising from rapid economic growth is an opportunity for change. Without falling back on the idea that agriculture and rural development can be financed via donor support, the proliferation of new donors provides some prospect of complementing domestic resources with donor finance. However, recipient countries will continue to have great

hand, the simple agricultural growth rate for the past decade (to 2009) is only 2.8, rather than 3.1, suggesting that agricultural growth accelerated less. The differences would disappear if weighted average growth rates were used.

² It is especially important to link landlocked countries to coastal access.

difficulties in coordinating all of the old and new funders. Furthermore, they will need to find ways to ensure that both donors and aid recipients conform to national development and sector policies, strategies, and plans. Entrepreneurial drive and ability to raise and deploy resources without taxing government capacities should be encouraged, as has long been the case with donations from foreign religious institutions of all faiths. The burden of compliance with national policies could be put squarely on the recipient of funds, combined with ex post “audits” to verify that policies have been adhered to. This would help reduce the donor coordination burden. Of course, for the larger existing and new government and multilateral donors, the coordination agenda of the Rome and Paris declaration remain fully in place. The CAADP process of coordinated national planning for agricultural development is intended to strengthen countries’ capacities to coordinate their donors in the agricultural sector.

The Capacity of Agricultural and Rural Institutions

Compared with 1980, the institutional environment for agriculture and rural development has improved in a number of respects. First, more space now exists for the *private sector*, including producer associations (although the private sector has not yet entered input and output markets sufficiently to create a vibrant and competitive environment for smallholders). Second, *communities and civil society* organizations have more opportunities to participate in development, and they are receiving domestic and foreign support to do so. Third, most *governments* are implementing decentralization policies, although administrative and fiscal decentralization continue to lag far behind political decentralization. While some improvements have been made in the *sector institutions* that set and monitor policies and finance and provide services for smallholders, overall these remain largely ineffective in much of Africa.

It is now understood that all four of the sets of institutions mentioned above need to collaborate for local and community development, including agricultural development. Central governments are responsible for leading and fostering such collaboration, ensuring that overall policy and financing are in place, and driving decentralization and public-sector reform. Although no studies have measured the impact of improved institutions on agricultural growth, there is little doubt that such improvements, in addition to macroeconomic stability and price incentives, are a key explanatory factor in the recent acceleration of agricultural growth.

Agricultural and rural institutions flourish best in the context of a broad, national capacity development strategy and program. Yet capacity development cannot be done in a top-down service-provision mode. It requires learning by doing, in which communities, local governments, farmer organizations, and private-sector actors have opportunities and resources and can exercise control over their own development. These actors need mandatory training in areas including diagnosis and planning, financial management and reporting, procurement, and monitoring and evaluation. Other training should be provided largely on a demand-driven basis. Capacity development must build on the considerable latent capacities found in rural communities. Rules and regulations for program execution must be participatory and empowering, eliminating complex features that discourage initiative and hinder local mobilization (Binswanger, de Regt, and Spector 2009). Finally, capacity development requires that sector institutions involved in rural development become more accountable to their clients. The International Fund for Agricultural Development (IFAD) has argued for a new approach to innovation and scaling up that supports local capacities (Box 1).

Box 1. A new take on “innovation” in Africa

The International Fund for Agricultural Development (IFAD) argues for more systematic promotion of innovations that can be scaled up and replicated by others (Poole and Buckley 2006). This would involve putting together packages of best international practices to reach target groups and enable them to improve their incomes and food security. In areas where international best practice is still unsatisfactory, such as rural finance, new initiatives could be selectively undertaken. The idea would be to test and perfect the integrated approaches on a sufficiently large scale so that they can be implemented throughout a specific agroclimatic zone, or even nationally.

Agricultural Incentives

A number of incentive-related issues remain to be resolved in much of Africa. Various countries in the region, including Malawi for example, continue to pursue adverse macroeconomic policies. Elsewhere, inflation remains stubbornly high, leading to interest rates so elevated as to make it difficult for agriculture to compete for investment resources.

In terms of Africa’s own agricultural trade policies, five issues stand out:

1. Although on balance protection rates (or more precisely, nominal rates of assistance to agriculture) are no longer negative, they remain below –10 percent in Côte d’Ivoire, Ethiopia, Sudan, Tanzania, Zambia, and Zimbabwe.
2. Taxation is still concentrated on exportable commodities, and levies on a number of such commodities are alarmingly high (although taxation levels have dropped from the extremely high rates of the 1970s and 1980s, and Africa has steadily improved its incentives regime).
3. Despite improvements, African farmers still face the worst agricultural incentives in the world because only Europe has reduced its nominal rates of assistance to agriculture, whereas these have been increased in both the United States and (especially) Japan. Even other developing regions have moved to protect their agriculture. In the case of Asia, the level of protection is close to the average for the developed world.
4. Although subregional integration is progressing, barriers to interregional trade remain, along with poor phytosanitary capacities.
5. Although improving, the business climate in most African countries remains far worse than elsewhere in the developing world, holding back the private sector both up- and downstream from the farm.

If countries in Africa want to compete in domestic, regional, and international markets and benefit from the rising trend in international agricultural prices, they must move aggressively to eliminate adverse agricultural export incentives and the remaining barriers to regional trade.

The Future of Smallholder Farmers

The spike in crude oil and food prices has led many private and sovereign investors to express strong interest in investing in large-scale farming in Africa. However, small-scale farmers are likely to fare better than larger holdings in seizing the current opportunities in domestic and regional markets. This is confirmed by our review of the literature on economies of scale in agriculture and reports of experiences with large-scale farming. Small farms tend to have lower costs of production than large-scale units. Inherent disadvantages related to mechanization, access to technologies, marketing, and input supply can be solved through rental markets for farm machinery and joint provision of agricultural

services, marketing, and input supply arrangements. Services can be provided by smallholders' own organizations or via contracts with agro-industrial firms. Midsize and large-scale farms appear advantageous only in the so-called plantation crops. These are highly perishable products that require immediate processing, packaging or shipping. Examples are tea, sugarcane, and fruits and vegetables for export. Yet even for these, contract farming with smallholders may sometimes be a more profitable option.

Because of the extremely adverse environment for rural finance in most of Africa, it is not surprising that many aid agencies have found it excruciatingly difficult to achieve success in rural finance for smallholders, but they still put rural finance high on the agenda in their agricultural programs. Instead we believe that the solution to farm investment issues needs to come from substantially improved agricultural incentives and profitability in general so that farmers are stimulated to invest returns back into their farms.³ This could be supported by easily accessible and low-cost savings mechanisms, such as postal savings systems linked to rural savings clubs. A complementary approach would be to finance more agricultural and rural investments via matching grants using funds from in-kind community contributions and individual savings.

With regard to agricultural research in Africa, the science and technology divide between SSA and the rest of the world is growing despite good returns to research investments. Rapid evolution in the international research environment toward biotechnology and private agricultural research are partly to blame. Technology borrowing is constrained by the uniqueness and heterogeneity of African environments. With its relatively adverse climate, poor resource base, and many other productivity constraints, Africa requires more rather than less research compared with other regions. The challenges of natural resource management and climate change strengthen this imperative.

Fortunately, African leaders have started to respond to the challenge by creating consensus on what needs to be done, improving national institutions of higher learning and research, building subregional and regional agricultural technology institutions, and developing biotechnology networks and institutions. Pillar IV of CAADP provides a vision and action plan for African agriculture, science, and technology. Unfortunately, the significant institutional responses have not yet been matched by adequate funding from national governments and international donors, especially in the areas of biotechnology and science education.

The Imperative of Regionalization

Many of the critical issues touched upon so far can best, or only, be solved through regional action. The examples in Box 2 illustrate the potential for regional approaches and the need for an overall regional strategy for rural Africa. As yet, most of these areas remain massively underfunded, mainly because regional efforts produce regional and subregional public goods, so their financing is subject to the familiar free-rider problem of financing public goods. Except for the largest countries, which have an incentive to supply themselves with these regional public goods, countries will seek to benefit from the investments of others. This is where a regional development-focused finance institution, such as the African Development Bank, could step in to coordinate and contribute to financing essential regional capacities.

³ The investment behavior of smallholder farmers in Africa is still poorly understood and should be a priority topic for future research using the panel data now being assembled by the World Bank in seven African countries.

Box 2. Why Africa needs regionalization

1. Small countries dominate SSA; yet because of their size they often lack the financial capacity for adequate investments in public goods.
2. Small landlocked countries generally do worse and depend on collaboration with their neighbors to do better.
3. Expanded regional trade is needed in food and agricultural products to spur economic growth, raise farmers' incomes, and improve regional food security. The short-run management challenges of the recent food price spike and the long-run opportunities arising from higher prices add to this imperative.
4. Regional trade and food security will be improved by harmonization of standards and sanitary measures along with subregional and regional implementation capacities.
5. Freer borders and internal infrastructure should encourage private-sector traders.
6. For small countries, regional infrastructure—roads, communications, and ports—are critical to access neighboring and overseas markets.
7. Reversing land degradation and desertification and preserving biodiversity require transboundary collective action.
8. Managing crucial but under-threat forestry and fisheries resources must be approached on a transnational basis.
9. Defense against plant and animal disease epidemics requires collective responses at the subregional and regional levels.
10. Success in agriculture depends on indigenous scientific capacity to generate new technology, which is better done on a regional or subregional basis because Africa has so many small and poor countries. The Forum for Agricultural Research in Africa (FARA) and subregional organizations are on the right track, but efforts need to be greatly expanded.
11. Biotechnology research is expensive and requires a large critical mass. Two or three regional institutes are therefore far superior to 48 or 24 underfunded, under-resourced national institutions.
12. Biosafety issues could be regulated more cost-effectively at a regional or subregional level than nationally.
13. Indigenous scientific capacity requires trained people, and training is better done by regional institutions with the necessary critical mass and financial support.
14. Regional approaches to rural financial architecture could increase deposits and loanable funds and spread risk.

Source: Binswanger-Mkhize and McCalla 2009a.

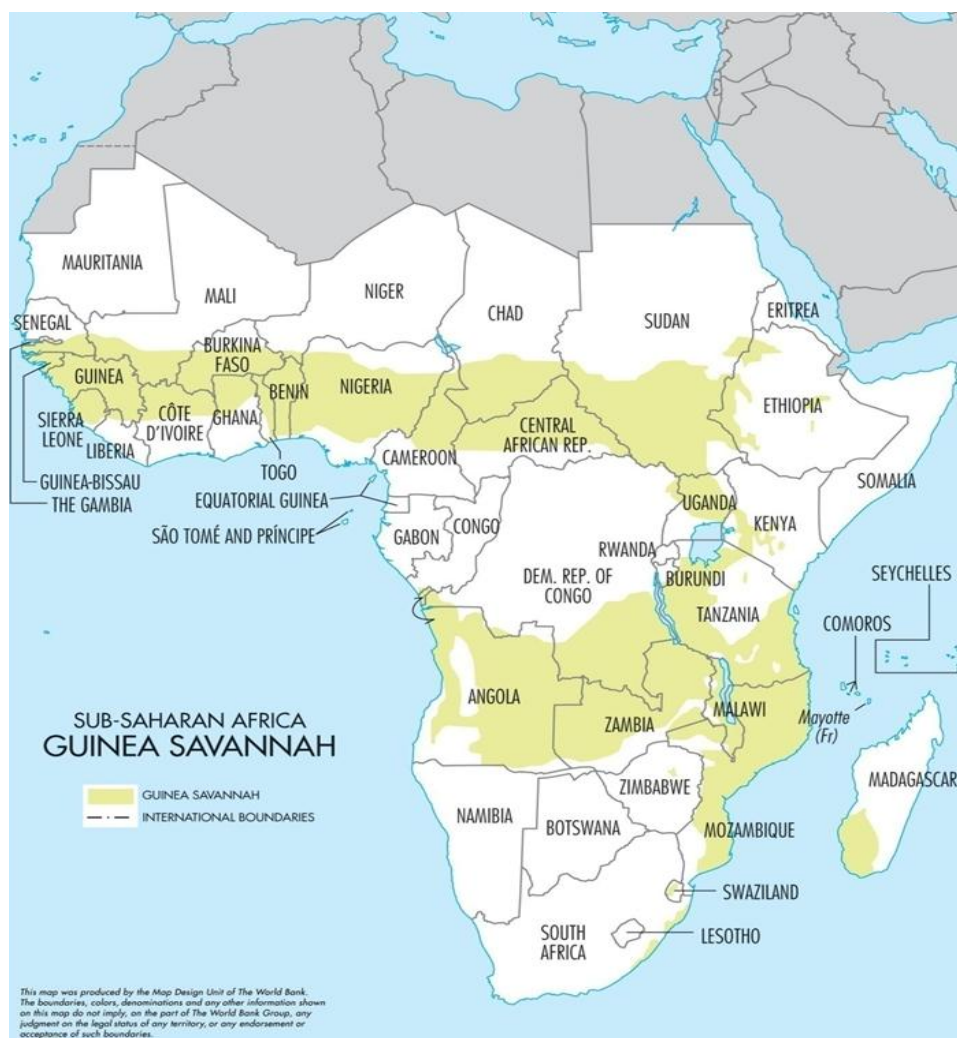
The African Development Bank fully recognizes its potential comparative advantage in support to regional collaboration. However, to become more active in supporting cross-border agricultural collaboration it would need additional analytical and implementation capacities. It would also have to overcome the difficulties that all multilateral lending agencies face in financing subregional and regional programs: They require governments to guarantee the loan repayments and, therefore, usually have to lend to individual countries rather than regional organizations. To effectively exercise a leadership role to support regionalization, the African Development Bank (as well as the World Bank) needs to develop streamlined mechanisms for financing regional and subregional programs that are not dependent on individual country borrowing decisions.

3. AWAKENING AFRICA'S SLEEPING GIANT

Study Approach and Methods

In 2009, the World Bank published a comprehensive study on the feasibility of developing a competitive commercial agricultural sector in Africa (World Bank 2009a, 2009b). The research included a series of country case studies designed to compare the *Cerrado* region of Brazil and the Northeast region of Thailand with similar agroecological areas in Mozambique, Nigeria, and Zambia. These three African countries depend heavily on agriculture, and offer extensive tracts of underutilized land in their Guinea Savannah zones (Figure 4). The Brazil and Thailand studies looked back in time to find factors that helped these regions to achieve their current international competitiveness. The three African cases were more forward looking. Cassava, cotton, maize, rice, soybeans, and sugar were the focal crops of the study, since these crops were important in the Brazilian and Thai cases. Four or more of these commodities are grown in each of the three African countries (Boxes 3 and 4 present details on the analytical framework and indicators used).

Figure 4. The Guinea Savannah zone in Sub-Saharan Africa



Source: International Food Policy Research Institute.

The study results reflect prices prevailing in mid-2007, when the empirical work was done. Since that time, global markets have been buffeted by two major agricultural commodity price spikes, in 2008 and in 2010/11. In the future, international commodity prices are likely to be higher than they were in 2007 (OECD–FAO 2008), implying that the estimates of African competitiveness are conservative. To inform commercialization policies and to design programs that are not detrimental to people and their environment, potential social and environmental impacts of agricultural commercialization were included in the three African case study countries (de Muro et al. 2008). Here too, lessons were drawn from the commercialization experiences of Brazil and Thailand.

Box 3. Case study methodology

The analytical framework for the case studies was derived from value chain analysis (see figure below). Use of this common framework generated quantitative indicators that could be compared across the various countries. With it, the authors were able to identify areas in which cost reductions or productivity increases could improve competitiveness (Keyser 2006). In each country, existing value chain studies were reviewed and the results applied to develop quantitative indicators. When necessary, knowledge gaps were filled by gathering additional data.

Stages of the value chain



The analysis covered three categories of farms. **Family farms** are those that are managed by family members and do not employ full-time workers, although they may hire workers during peak periods. **Emerging commercial farms** are also managed by family members, but they typically employ one to three full-time workers and hire seasonal workers during peak periods. **Large commercial farms** have specialized managers. They employ three or more full-time workers, as well as additional seasonal workers.

Box 4. Indicators used to assess competitiveness

The value chain analysis generated a series of indicators that were used to assess productivity and competitiveness:

Average yield. Yield (kg/ha) is a standard indicator of physical farm productivity.

Farm-level shipment value. Shipment value (US\$/ton), defined as the value in financial terms of domestic and foreign inputs per unit of output, represents the unit value of the unprocessed commodity. It is a better indicator of competitiveness than yield because high yields may require high levels of expensive inputs.

Import competitiveness ratio. This is an indicator of shipment value at the main domestic consumption point, relative to the import-parity price at main domestic consumption point. (The import-parity price is the price at which imported goods would be sold at a given point in the country if there were no trade barriers or other distortions in the economy, such as overvalued exchange rates.)

Export competitiveness ratio. This indicator represents shipment value at the border relative to the export-parity price at the border. (The export-parity price is the price that domestic exporters would receive for their product at a given place, such as, at the border, if there were no trade barriers or other distortions in the economy.)

An import or export competitiveness ratio of less than 1 indicates that the country is competitive in that commodity.

Findings from the Brazil and Thailand Experiences

Long characterized as economically “backward,” the Brazilian *Cerrado* and Northeast region of Thailand both started out with limited agricultural potential and poor infrastructure. Yet beginning in the 1960s, both regions showed remarkable, sustained growth over a 40-year period, allowing them to become highly competitive in world markets. In the Brazilian *Cerrado*, the transformation was led by soybeans, the production of which jumped from 250,000 metric tons in 1961 to more than 30 million metric tons in 2000. In Northeast Thailand, cassava led the export takeoff, with the country’s production (heavily concentrated in the Northeast) rising from 1.7 million metric tons in 1961 to 20.7 million metric tons in 1996. Comparable production increases were later achieved in other bulk commodities, such as rice in Brazil, and rice and maize in Thailand.

The initial successes achieved in low-value bulk commodities were subsequently extended to high-value commodities, including processed products (for example, sugar, soybean oil, cotton lint, cassava starch, and cattle). The pathway to growth was similar in both countries. Brazilian and Thai farmers initially were able to expand production by focusing on specific markets in which they enjoyed preferential access. After capturing economies of scale in production and processing, they established themselves as low-cost global producers that could compete virtually anywhere. Yet there were also important differences. Brazilian farmers achieved success by relying on large-scale mechanized production methods, whereas agriculture in Northeast Thailand was and remains essentially the domain of smallholders who have mechanized some tasks, such as land preparation.

A number of supply-side factors contributed to the successful commercialization experience in each country. In Brazil, four factors were key: (1) improved agricultural technology developed by the national agricultural research organization—especially tropical soybean varieties and techniques for managing low-fertility soils; (2) publicly financed infrastructure, rural credit, and business development services; (3) the entrepreneurial knowhow of highly skilled farmers from the southern part of the country who migrated to the *Cerrado*, and (4) a stable and trade-oriented policy environment that improved the investment climate and permitted the direct transmission of international market signals to farmers. In Thailand, three supply-side factors were most important: (1) improved agricultural technologies for cassava, paired with improved methods of soil-nutrient conservation and erosion control; (2) government and donor investment in rail and road infrastructure; and (3) a dynamic private sector that responded quickly to market signals.

Demand-side factors played a role in both countries as well, in the form of export opportunities. Strong growth in global demand for soybeans and soybean-derived products beginning in the 1970s led to the spectacular transformation of the *Cerrado* into a leading global supplier of soybeans. In Thailand’s case, export opportunities resulted from growth in European Union (EU) demand for cassava pellets as an inexpensive substitute for cereal-based livestock feed. The demand from Europe was driven by policy distortions. In particular, the Common Agricultural Policy (CAP) had fixed high grain prices, while the EU had to maintain low tariff access for nongrain feed stuffs and oilseeds as a result of the Dillon Round General Agreement on Tariffs and Trade (GATT) negotiations. The resulting dramatic expansion of cassava production sparked broader agricultural and economic growth throughout Northeast Thailand.

Applying the Lessons in Africa’s Guinea Savannah

Six key insights emerge from the study concerning the current and future competitiveness of the African study countries.

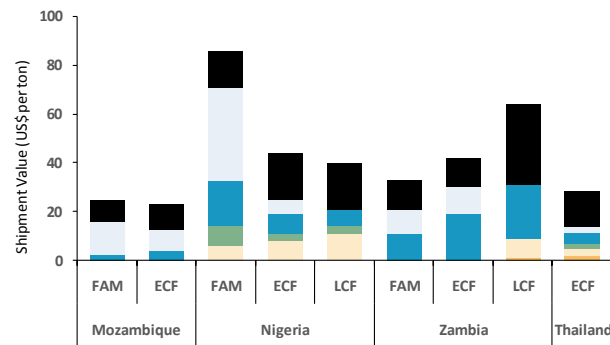
1. **Farm-level production costs in Africa are competitive.** Despite significantly lower yields in the African countries, farm-level unit production costs in Mozambique, Nigeria, and Zambia are comparable to or lower than those in the Brazilian *Cerrado* and in Northeast Thailand, due to very low labor costs and limited use of purchased inputs. Although low unit production costs

help to make African producers competitive in the short run, they do not represent a sustainable path out of poverty in the long run because, at current low productivity levels, agriculture is economically impoverishing and technically unsustainable.

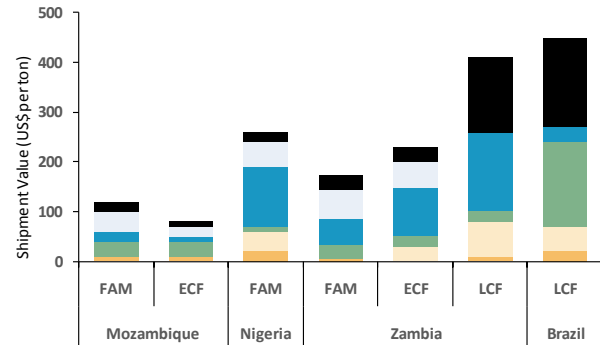
2. ***Africa's producers are generally competitive in domestic and regional markets.*** The competitiveness of Africa's producers at the farm level makes them generally competitive in domestic markets relative to imports. For example, Nigerian farmers can produce and deliver soybeans to Ibadan at 62 percent of the cost of imported soybeans, and Zambian farmers can deliver sugar to the market of Nakambala at 55 percent the cost of imported sugar. The high cost of international and domestic logistics provides a certain degree of "natural protection." Since domestic and regional markets for many of the targeted commodities are large and rapidly growing, and since significant imports are already taking place, prospects for import substitution are bright, especially for rice, soybeans, sugar, and maize (Figure 5).
3. ***Africa's producers are generally not competitive in global markets.*** When it comes to exporting, producers in the African case study countries are generally not competitive due to high logistical costs stemming from deficiencies in transport, processing, and storage infrastructure; lack of competition in vehicle import and trucking industries; cumbersome and costly transport regulations; and the frequent extortion of bribes from truckers at border crossings and police checkpoints. Mozambican farmers, for example, would have to cut domestic production and logistical costs by more than 80 percent to become competitive exporters of cassava to Europe. A notable exception is cotton and, in some countries, sugar and maize, which can be exported profitably at least in some years.
4. ***In the short- to medium-term, regional markets offer the most promising opportunities.*** For the six commodities under consideration, African producers are more favorably positioned to serve regional markets than the countries that currently dominate international trade. Logistical costs are less when serving regional markets than when exporting overseas; moreover, as a result of population growth, income gains, and urbanization demand in regional markets is expected to grow.
5. ***Smallholders are a source of competitiveness.*** Contrary to many perceptions, few scale economies were found in the production systems analyzed. Compared with large commercial farms, family farms and emerging commercial farms typically had lower shipment values at the farm level or final distribution point.

Figure 5. Composition of farm-level shipment values

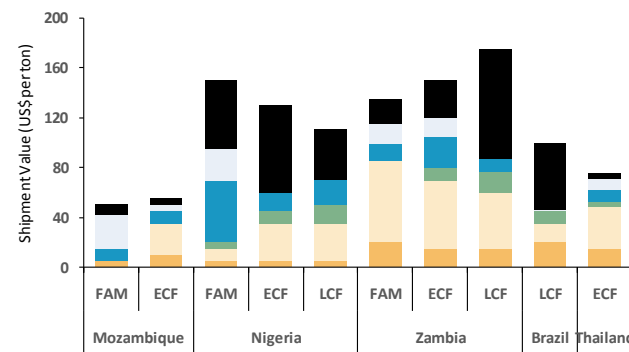
a. Cassava



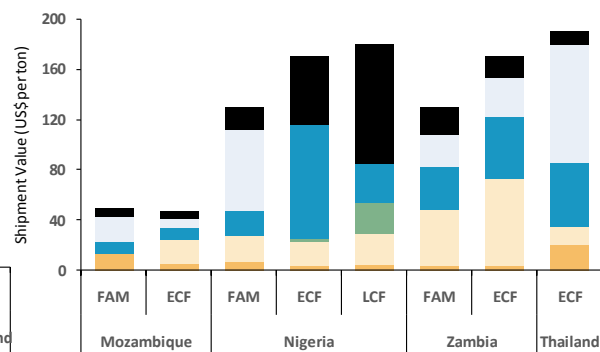
b. Cotton



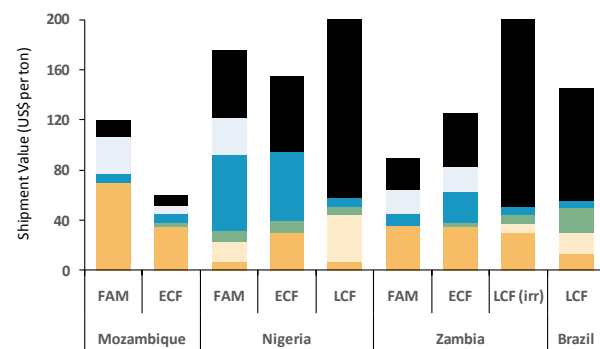
c. Maize



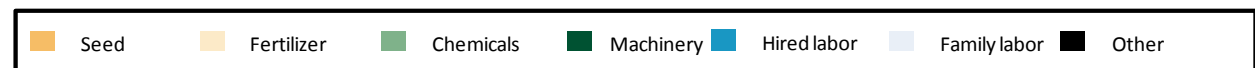
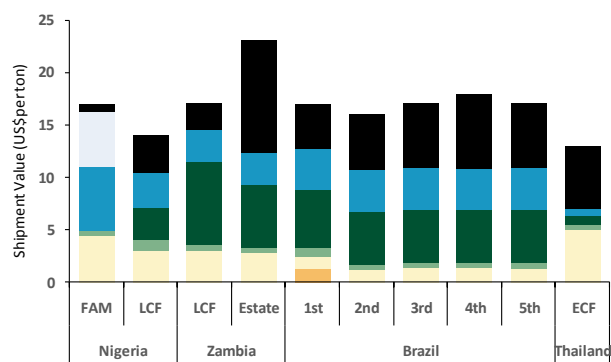
d. Rice



e. Soybeans



f. Sugar



Source: Constructed by authors.

Note: FAM indicates family farms; ECF, emerging commercial farms; and LCF, large commercial farms.

Social Impacts of Agricultural Commercialization: Small versus Large Farms

In Brazil and Thailand, the social impacts of the expansion of commercial agriculture depended on seven factors: (1) the macroeconomic environment, especially interest and exchange rates; (2) the land-tenure system and distribution of land holdings; (3) the difference between import-parity and export-parity prices; (4) the flexibility of the marketing systems; (5) the extent to which agricultural services (for example, extension, finance, and input supply) reached small-scale farmers and female farmers; (6) the capacity and willingness of governments and farmer organizations to tap some of the growth from commercial agriculture to finance public investments in health and education; and (7) the effect of the growth on the political and social integration of the previously isolated regions with the rest of the country.

Brazil and Thailand differed on some of these factors, leading to dissimilar social outcomes. In Brazil, ineffective land policies and failed settlement programs, combined with subsidized credit and marketing interventions until the mid-1980s, resulted in a skewed distributional outcome in terms of land ownership and farm income. Moreover, the series of land reforms introduced since the 1990s has failed to correct the problem. This contrasts sharply with the systematic land reform and land titling policies pursued by Thailand over the past 30 years. Consequently, the poverty-reducing effects were much larger in Thailand than in Brazil.

The starkly different social outcomes observed in Brazil and Thailand raise the question of what is the optimal farm size for rapid agricultural commercialization. This issue has gained urgency in recent years with the appearance in Africa of growing numbers of mainly foreign investors looking to launch large-scale farming enterprises. As previously discussed, based on our review of the literature, and taking into account the results of the analysis here, there is little to suggest that the large-scale farming model is either necessary or even particularly promising for Africa, except possibly for sugarcane among the commodities studied. The settler farms of Eastern and Southern Africa are often cited as successful examples of large-scale farming; however, closer examination reveals that these farms were created by expropriating land from indigenous populations, then nurturing with a stream of preferential policies, subsidies, and supporting public investments. More recent attempts to promote large-scale farming in Africa have hardly been encouraging, except in plantation crops. The current study was unable to identify a single case where large-scale farms, outside of the settler economies, achieved competitiveness in the export of food crops (Poulton et al. 2008).

This is not to say that large-scale farming has no role to play in Africa; large-scale farming may be preferable in several cases. The first is when economies of scale are present in marketing or shipping, as with plantation crops (for example, sugar, oil palm, tea, bananas, and horticultural crops grown for export). After being harvested, these crops need to be processed quickly or transferred to a cold storage facility. The economies of scale associated with processing and shipping these crops are transmitted to the farm level making plantation farming a good option to capture them. Second, large farms may be preferable in cases where African producers must compete in export markets with stringent quality requirements, but contract farming is not feasible (for example, because of the high cost of enforcing crop management contracts to comply with standards). Third, large-scale farming may be appropriate in cases where relatively fertile land is to be developed in areas of low population density and with scarce labor. Under such conditions, large-scale mechanized farming may be preferred, although smallholder expansion could also be feasible, for example, with mechanization using draft animals or hired machinery services. Unpopulated areas, however, may require significant in-migration from more densely populated areas, to which political obstacles may arise.

The question is then whether Africa could benefit from the smallholder-led commercialization strategy that was pioneered by Thailand and is now being implemented in China and Vietnam. There is no doubt that smallholder agriculture can drive rapid agricultural growth and reduce poverty on a

massive scale—this has been amply demonstrated by many Asian and some African countries (for example, Ghana). The literature shows that family farmers are more motivated to work hard and manage their enterprises efficiently, and this is thought to be at the root of their productivity advantage. The current study confirms that small-scale family farms are generally the lowest cost producers; however, the fact that a smallholder-led strategy can be successful does not mean that all smallholders will be able to “farm their way out of poverty.” Between one- and two-thirds of all rural households in SSA lack sufficient land and other resources to do so. The future of these rural households depends on opportunities to work for other farmers who are better resourced to grow or to find jobs in the nonfarm sector. Either way, a vibrant agriculture sector is needed. A successful farming sector strengthens off-farm portions of agricultural value chains via forward and backward linkages, and a range of off-farm enterprises are usually driven by agricultural incomes via consumer demand linkages (Staatz and Dembele 2007).

Potential Environmental Impacts of Agricultural Commercialization

The experiences of Brazil and Thailand (and many other countries) show that the rise of commercial agriculture is usually associated with conversion of forests, woodlands, and savannah to agricultural uses. If forests and woodlands occupy good agricultural land, it is hard to see how such conversion can be avoided in the long run. Loss of biodiversity could be minimized by an appropriate system of forest reserves. In the *Cerrado*, 5.5 percent of the land is protected under some type of reserve (Wikipedia 2009). Farmers there are required by law to set aside 35 percent of their land for nature. Conversion to agriculture brings other risks as well—such as inappropriate use of fertilizers, irrigation-related issues such as salinization, release of sequestered carbon into the atmosphere, and pesticide pollution—some of which also have impacts on human health. In Brazil, these problems have been mitigated with the widespread adoption of conservation farming techniques, by setting aside forest strips especially along streams and rivers, and more recently by enforcing standards for the export of commodities such as soybean and sugar.

Localized environmental damage caused by intensive commercial agriculture may be acceptable if the alternative would be even greater environmental damage elsewhere. The environmental impacts of commercial agriculture therefore need to be assessed in comparison to the unsustainable practices associated with low-productivity subsistence farming. For example, population pressure may drive smallholders to clear forests, shorten fallows, or move to more fragile areas.

4. PROSPECTS FOR COMMERCIAL AGRICULTURE IN AFRICA

Five factors underlie the current good prospects for commercial agricultural in the African Guinea Savannah.

1. **Rapid demand growth.** Demand for agricultural commodities that could be produced in the Guinea Savannah is expected to increase due to a number of factors: (1) accelerating rates of income growth in Africa, combined with still-high population growth rates and rapid urbanization; (2) the import substitution opportunities arising from the large and growing food imports of many African countries; (3) the growing food demand in Asia; and (4) new markets for biofuels that have driven up international agricultural prices.
2. **More favorable policies.** The macroeconomic environment in many African countries has improved, as reflected by low inflation, declining real interest rates, and market-determined exchange rates. Net taxation of agriculture has also fallen. All of these factors are improving incentives to invest in agriculture. Most countries of SSA have endorsed CAADP, which calls for a

minimum of 10 percent of national budgets to be allocated to agricultural development and for more favorable and inclusive sector policies toward agriculture.

3. **An improved business climate.** Investments in basic infrastructure are being given priority, and institutional reforms are under way to reduce administrative burdens on businesses and to combat corruption. Decentralization 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, is opening space for independent producer associations and business organizations.
4. **Increased incentives to invest in agriculture.** Domestic and foreign capital is beginning to flow into African agriculture and related value chains, as is evidenced by the recent acquisition of land leases for food production, biofuels, and high-value agricultural exports. Foreign investment needs to be well managed, however, to ensure positive social and environmental outcomes.
5. **Availability of new technologies.** New technologies for land-abundant countries with poor infrastructure have proven quite difficult to design in the past. Nevertheless, technologies such as conservation tillage and integrated soil fertility management are at a more advanced stage of development than they were a generation ago. Improved varieties for a number of crops are also more widely available. More new varieties will be needed to overcome pests, diseases, and abiotic stresses such as heat and drought. Biotechnology and transgenic crop varieties could speed their development. Finally, the cellular telephone revolution is linking farmers and traders to sources of demand and supply and to technical information.

Constraints to be Overcome

Replication in Africa of the commercialization successes achieved in Brazil and Thailand is constrained by four main factors.

1. **Tougher international competition.** Product specification requirements in global markets are becoming more and more exacting, as is evidenced by tightening safety regulations, higher quality standards, and prohibitions on genetically modified organisms. In addition, OECD agricultural subsidies continue to tilt the playing field.
2. **Exogenous shocks.** The HIV/AIDS epidemic still rages in many parts of Africa, eroding capacity in agricultural research and extension, among many other areas. Climate change is likely to reduce rainfall throughout West Africa and increase rainfall variability across the continent. Volatility of global agricultural markets will likely remain high as well.
3. **Weak national and donor commitment.** Declarations made by African policymakers in favor of agriculture have yet to be uniformly followed through with sustained policy reforms and investments. Recent years have seen a modest increase in donor support to agriculture from the earlier extremely low levels, but the rhetoric has thus far exceeded actual funding commitments.
4. **Weak social cohesion, lack of political stability, and bureaucratic ineptitude.** In many parts of Africa, political and ethnic rivalries reduce trust among market participants and raise transaction costs. Political instability undermines the business climate. The capacity of African government bureaucracies to facilitate coordination of different actors in competitive value chains remains underdeveloped.

Needed Interventions

Actions are needed on a number of fronts to realize the agricultural potential of the Guinea Savannah.

1. **Continuing policy reforms.** Agricultural exports in Africa are still being taxed at higher levels than in other regions, so governments need to continue to move domestic prices toward export prices. Countries also need to implement their regional integration agreements, including banning arbitrary export restrictions, streamlining border logistics, and harmonizing standards and regulations. All of these are major impediments to regional trade.
2. **Improving land administration systems.** Providing secure and transferable land rights to communities and individuals is critical to protect the interests of local populations while helping entrepreneurial farmers acquire land in regions of low population density. Clear land rights allow land to change hands over time to those who can use it most productively. It also provides incentives to invest in raising land productivity. The land-tenure-induced crises recently seen in Côte d'Ivoire and Zimbabwe are examples of the huge costs associated with the failure to address this issue. The challenge is likely to increase in future years due to the growing demand for land for use in commercial farming.
3. **Scaling up public investments.** Agricultural development cannot be done on the cheap. Africa's low level of investment in agricultural research has been particularly damaging in this regard. Brazil's long-term commitment to develop its national agricultural research organization, Embrapa, and the payoffs from that investment in developing the *Cerrado* are striking. Increased investment is also needed to strengthen agricultural education: to replenish Africa's graying agricultural research establishment; to provide the large number of technicians required by modern agriculture and value chains; and to instill in farmers the basic skills to access and master new production technologies. A major challenge is to develop cost-effective and demand-driven advisory services, through effective partnerships between farmer organizations, public agencies, and civil society. Finally, massive investment is needed to build or rebuild infrastructure in irrigation, roads, energy and overall logistics, especially port infrastructure.
4. **Inducing private investment.** The private sector must lead the way on many of the critical investments needed to drive agricultural commercialization. The business climate is especially important for commercial agriculture and for private-sector input suppliers and agroprocessing companies. Strong farmer organizations and vigorous private-sector and civil-society organizations will be vital as well.
5. **Making markets work better.** Successful commercialization of agriculture depends on functioning markets. The greatest challenge to commercial agriculture is to put in place the institutions to make markets more efficient and less risky. Given the weak development of private markets, the state needs to offer certain critical services that the private sector currently has few incentives to provide. The needed actions will vary by commodity and country, and experimentation is required to develop appropriate models. A key challenge is knowing when the state should step aside and give greater scope to the private sector as markets for these services mature. It is easy for the state to overstep and crowd out private initiative.
6. **Public-sector reform and governance.** For the state to play its required roles in commercial agriculture, ministries of agriculture, other ministries with complementary roles, and local governments need sharply upgraded capacities and skills in areas such as marketing and business development services. They will also need the ability to forge a variety of partnerships involving the public and private sectors, and civil society. A major governance challenge will be to coordinate the services and investments of multiple ministries and levels of government, and coordinate public and private investments. High-level political leadership can ensure that

agricultural development for specific regions is a priority. Such leadership was evident in both the Brazil and Thai examples.

7. ***Management of social and environmental impacts.*** A critical challenge in Africa will be reform of customary land policies to allow equitable distribution of land and secure tenancy for migrants, farmers, and investors. Transforming the natural ecosystems found in the Guinea Savannah into vibrant commercial farming systems will not be possible without converting woodlands and grazing areas to agricultural land. This will bring some environmental costs, but the current low-input extensive agriculture is also exacting high environmental costs. Experience from many parts of the world, including Brazil and Thailand, shows that the environmental costs associated with the development of commercial agriculture can be reduced and managed at tolerable levels.

5. CONCLUSION

While it would be easy to feel overwhelmed by the many constraints facing African farmers, Brazil and Thailand provide important lessons about how these constraints can be overcome. In these two countries, government played a vital role by establishing an enabling environment characterized by favorable macroeconomic policies, adequate infrastructure, a strong human capital base, reasonably competent government administration, and political stability. This enabling environment allowed the private sector to mobilize its creativity, drive, and resources in ways that have served broader social goals as well as private interests. After decades of state domination, many initiatives under way in Africa are beginning to use similar approaches.

One advantage for African policy is the knowledge from the Thai and Brazilian experiences that agricultural revolutions can be driven by either smallholders or large-scale commercial farmers. Evidence suggests that, on balance, the fruits of those revolutions are more widely shared when smallholders participate, not only through direct effects on employment and land ownership, but also through second-round consumption linkages. Larger smallholder farms will need appropriate labor-saving technologies to emerge as viable commercial farms.

Further grounds for optimism come from the knowledge that if the development of smallholder commercial agriculture begins solidly, the process can be self-reinforcing. As the Thai experience illustrates, those who initially gain in the process (commercial farmers, farmer organizations, and agribusiness firms) will be motivated to lobby for policies and investments that can sustain the commercialization process. As commercialization proceeds, larger private-sector actors will have increasing incentives to invest in infrastructure and in support services for value-chain coordination. This will reduce the burden on government. At the same time, political leaders must continue to play an active role by providing the vision, strategy, consistent implementation, and long-term commitment needed to make agricultural transformation a reality.

The two sections of this paper are complementary. The first section emphasized that agricultural prospects have improved. This was attributed to higher international prices, improved macroeconomic and agricultural policies, improved institutional environments for agriculture and rural development, and greater government commitment to agriculture. The second section looked at two examples of how Africa could capitalize on today's opportunities, in particular in the Guinea Savannah zone. Both sections emphasize commercialization as an essential part of an agricultural strategy, although the potential for surplus production is higher where populations are sparse and opportunities significant. Both sections also emphasize the immediate opportunities in production for domestic and regional markets. This is due, first of all, to the rapid economic and income growth expected within Africa itself. Second, the current context offers opportunities for import substitution in markets that Africa has lost in the past. Third, the lower phytosanitary constraints in domestic and regional markets make them better bets than

global markets at Africa's current level of infrastructure and institutional development. Doing well in domestic and regional markets could prepare Africa to subsequently conquer global markets.

Opportunities are better today than they have been for decades. Nonetheless, enormous challenges lie ahead: maintaining macroeconomic stability in a challenging global context; further improving agricultural policies and general and agricultural investment climates; making progress in regional integration, in particular reducing barriers to intra-regional trade, standardizing trade and transport protocols, and standardizing and improving phytosanitary regulations; increasing public expenditures for agriculture and especially for agricultural research and technology dissemination; and improving infrastructure, market access, and access to inputs and credit for farmers. This is a daunting list of challenges, but other regions and African countries have shown that progress can be made. The payoffs could be enormous in terms of economic and agricultural growth, food security, and poverty reduction.

REFERENCES

- Badiane, O. 2011. *Agriculture and Structural Transformation in Africa*. Stanford Symposium Series on Global Food Policy and Food Security in the 21st Century. Stanford, CA: Freeman Spogli Institute for International Studies.
- Binswanger-Mkhize, H. P., and A. F. McCalla. 2009a. *The Changing Context and Prospects for Agricultural and Rural Development in Africa*. Rome and Tunis: International Fund for Agricultural Development and African Development Bank.
- _____. 2009b. *The Changing Context and Prospects for Agricultural and Rural Development in Africa*. Handbook of Agricultural Development. Vol. 4. Amsterdam: Elsevier.
- Binswanger, H. P., J. de Regt, and S. Spector. 2009. *Local and Community-Driven Development, Moving to Scale in Theory and Practice*. New Frontiers in Social Policy. Washington, DC: World Bank.
- Byerlee, D., X. Diao, and C. Jackson. 2005. *Agriculture, Rural Development and Pro-Poor Growth: Country Experiences in a Post-Reform Era*. Agriculture and Rural Development Discussion Paper 21. Washington, DC: World Bank.
- De Muro, P., R. Bocci, S. Gorgoni, L. Lombardo, E. Martone, L. Silici, and L. Russo. 2008. Mozambique, Nigeria, and Zambia Case Studies: Social and Environmental Impact Assessments. 2007. <http://siteresources.worldbank.org/INTAFRICA/Resources/257994-1215457178567/CCAA_Soc_Env_Impacts_Main.pdf>.
- Diao, X., and P. Hazell. 2004. *Exploring Market Opportunities for African Smallholders*. 2020 Africa Conference Brief 6. Washington, DC: International Food Policy Research Institute.
- FAO–OECD (Food and Agriculture Organization of the United Nations and Organisation for Economic Co-operation and Development) with contributions from IFAD, IMF, UNCTAD, WFP, World Bank, WTO, IFPRI, and UN HLTF. 2011. Price Volatility in Food and Agricultural Markets: Policy Responses: A Policy Report. <<http://www.oecd.org/dataoecd/40/34/48152638.pdf>>.
- Fuglie, K. O. 2008. Is a Slowdown in Agricultural Productivity Growth Contributing to the Rise in Commodity Prices? *Agricultural Economics* 39 (supplement): 431–441.
- Fuglie, K. O. 2010. Total factor productivity in the global agricultural economy: Evidence from FAO data. In *The Shifting Patterns of Agricultural Production and Productivity Worldwide*, J. Alston, B. Babcock, and P. Pardey, eds. Ames, IA: Midwest Agribusiness Trade and Research Information Center (MATRIC), Iowa State University.
- IMF (International Monetary Fund). 2011. World Economic Outlook: Slowing Growth, Rising Risks. Washington, DC.
- Keyser, J. C. 2006. *Definition of Methodology and Presentation of Templates for Value Chain Analysis: Competitive Commercial Agriculture in Africa (CCAA)*. Washington, DC: World Bank.
- Ndulu, B., with L. Chakraborti, L. Lijane, V. Ramachandran, and J. Wolgin. 2007. *Challenges of African Growth: Opportunities, Constraints and Strategic Directions*. Washington, DC: World Bank.
- OECD–FAO (Organisation for Economic Co-operation and Development and Food and Agriculture Organization of the United Nations). 2011. *Agricultural Outlook, 2011–2020*. Paris and Rome.
- Poole, N. 2006. *Innovation Challenges, Constraints and Opportunities for the Rural Poor*. Rome: International Fund for Agricultural Research.
- Poulton, C., G. Tyler, P. Hazell, A. Dorward, J. Kydd, and M. Stockbridge. 2008. *All-Africa Review of Experiences with Commercial Agriculture: Lessons from Success and Failure*. <http://siteresources.worldbank.org/INTAFRICA/Resources/257994-1215457178567/CCAA_Success_failure.pdf>.
- Rodrik, D. 2003. *In Search of Prosperity: Analytical Narratives on Economic Growth*. Princeton, NJ: Princeton University Press.

- Staatz, J., and N. N. Dembélé. 2007. Agriculture for Development in Sub-Saharan Africa. Background paper prepared for the *World Development Report 2008: Agriculture for Development*. <http://siteresources.worldbank.org/INTWDR2008Resources/2795087-1191427986785/StaatzJ&Dembelen_AgriForDevtInSSA_ve19.pdf> .
- Wikipedia. 2009. Cerrado. <en.wikipedia.org/wiki/Cerrado>.
- World Bank. 2009. *Awakening Africa's Sleeping Giant: Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond*. Directions in Development. Washington, DC: World Bank and FAO.
- _____. 2011. *Food Price Watch*. Washington, DC: World Bank Poverty and Equity Group.
- World Bank–IFC (International Finance Corporation). 2011. *Doing Business 2011, Making a Difference for Entrepreneurs*. Washington, DC.



**INTERNATIONAL FOOD
POLICY RESEARCH INSTITUTE**
sustainable solutions for ending hunger and poverty
Supported by the CGIAR

2033 K Street, NW | Washington, DC 20006-1002 USA
Tel: +1.202.862.5600 | Skype: ifprihomeoffice
Fax: +1.202.467.4439 | Email: ifpri@cgiar.org

www.ifpri.org



**FORUM FOR
AGRICULTURAL
RESEARCH
IN AFRICA**

PMB CT 173 | Accra, Ghana
Tel: +233.302.772823
Fax: +233.302.773676 | Email: info@fara-africa.org

www.fara-africa.org

The Agricultural Science and Technology Indicators (ASTI) initiative compiles, analyzes, and publishes data on levels and trends in agricultural R&D investments, capacities, and institutional arrangements in developing countries. ASTI is managed by the International Food Policy Research Institute (IFPRI) and involves collaborative alliances with many national and regional R&D agencies.

Jointly convened by ASTI/IFPRI and the Forum for Agricultural Research in Africa (FARA), the conference, "Agricultural R&D—Investing in Africa's Future: Analyzing Trends, Challenges, and Opportunities," brought together experts and stakeholders from the region to contribute their expertise for the purpose of distilling new insights and creating synergies to expand the current knowledge base. The themes under focus were (1) why African governments under invest in agricultural R&D; (2) how human resource capacity in agricultural R&D can be developed and sustained; (3) how institutional structures can be aligned and rationalized to support agricultural R&D; and (4) how the effectiveness of agricultural R&D systems can be measured and improved.

The conference was funded by the Bill and Melinda Gates Foundation and FARA.

This paper has been peer reviewed and may also have been slightly revised after the conference. Any opinions stated herein are those of the author(s) and are not necessarily endorsed by or representative of IFPRI or FARA.

Copyright © 2011 International Food Policy Research Institute and Forum for Agricultural Research in Africa. For permission to republish, contact ifpri-copyright@cgiar.org.