



# Transforming Sub Saharan Africa Agriculture

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# **Transforming Sub Saharan Africa Agriculture**

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## Introduction

Across Sub-Saharan Africa (SSA) agriculture is a dominant 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. And yet, though it has the potential to be an agricultural power, a combination of low productivity and an inadequate policy framework make SSA the world's most food-insecure region. Over the last 40 years it has also been steadily losing its share of the global agricultural market. With less than 10% of SSA's population, Thailand exports more food products than all SSA countries combined, and Brazil's food exports are now 150% higher than those of SSA, although levels were similar in the 1980s. 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 the world (Evenson and Gollin 2003)<sup>1</sup>. Two main factors are responsible. First, little land on the continent is irrigated. Only two percent of Africa's renewable water resources are used, compared to a global average of five percent. Of the 183 million hectares of cultivated land in 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 are currently operational. Second, modern inputs and technological processes are grossly underutilized. Africa has, by far, the lowest rate of improved seed and fertilizer use of any region—a rate that has remained virtually constant for the last 40 years—and the lowest level of mechanization in the world. In consequence, African farmers have the lowest farm productivity; their grain yields only one-half of those achieved by Asian or Latin American farmers.

The case for transforming agriculture and agribusiness in SSA is a pressing development priority. Beyond improving food security, this is potentially the single most important growth opportunity for entrepreneurs. The good news is that after decades of neglect, agriculture is again receiving greater attention at the international level as well as from African governments, investors and development agencies. With Agenda 2030 and the Sustainable Development Goals there is a strong international framework to boost sustainable agricultural development. The African Union's long-term vision for progress, Agenda 2063, also recognizes agriculture's contribution to sustainable and inclusive development. In 2015, after extensive consultation, the Kofi Annan Foundation convened the African Food Systems Initiative (AFSI), an informal platform of African and multinational corporations, philanthropic organizations, civil society institutions and global food agencies. The AFSI promotes investment in African agriculture and advocates for adequate policies to help smallholder farmers build profitable businesses, while boosting the nutritional quality of their food crops and protecting their environment. Agriculture and agribusiness together are projected to be US\$ 1 trillion industries in SSA by 2030 (compared to US\$ 313 billion in 2010)<sup>2</sup>.

It is also now clearly recognized that country's economic, environmental and social well-being is intricately linked to a healthy, well-performing agricultural and agribusiness sector. Successful

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<sup>1</sup> Evenson R.E. and Gollin D. 2003. *Assessing the Impact of the Green Revolution, 1960 to 2000* Science 300, 758 (2003). 10.1126/science.1078710

<sup>2</sup> *Growing Africa Unlocking the Potential of Agribusiness.* (2013). The World Bank

agriculture and agribusiness investments stimulate agricultural growth through the provision of new markets and the development of a vibrant input supply sector. Such growth then cascades into other sectors of the economy, ushering a new phase of development. Increasing investments in the farm economy can deliver high-impact development returns by increasing rural incomes, boosting food security, making cheap and more nutritious food available to bustling cities and protecting the environment through innovations and climate smart agriculture development.

This policy brief takes a broad approach to outline the global issues, challenges and opportunities facing agriculture and agribusiness in SSA.<sup>3</sup>

## Challenges

Over 75% of the world's poor live in rural areas and depend on agriculture for their livelihoods. To eradicate poverty and hunger by 2030, the world needs a food system that can feed every person, every day, everywhere. With the global population expected to exceed 9 billion by 2050, achieving 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. FAO estimates that global food demand will double by 2050 and the world will then need to feed 2.3 billion more people.<sup>4</sup> These populations will be increasingly affluent and will demand more, different, and better food. Meeting this demand requires agricultural production to grow 60 percent by 2050. But in addition to providing safe food and adequate nutrition; agriculture can be the conduit to raise real incomes of the poorest people and better manage the world's natural resources.

In many SSA countries, 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 agricultural investments. While all developing regions taxed agricultural production from the 1960s through the 1980s, only SSA 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.

A comparison of Africa's performance with that of South America and three sub regions of Asia over the course of two decades indicates that Africa began the 1990s with lower total factor productivity (TFP) than its counterparts. Gollin et al (2014)<sup>5</sup> show that labor productivity is far

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<sup>3</sup> This research policy brief is based on research, fact findings of the authors and J. Saghir article *Global challenges in agriculture and the World Bank's response in Africa* published in the Journal of Food and Energy Security. (2014). John Wiley & Sons Ltd and the Association of Applied Biologists. Wiley Online Library. It is also an update of the study prepared under the guidance of J.Saghir, *Unlocking Africa's Agricultural Potential*. 2013. Washington, DC: World Bank and the report *Growing Africa: Unlocking the Potential of Agribusiness*. Washington, DC: World Bank. The findings, interpretations and conclusions expressed are entirely those of the author and should not be attributed in any manner to the World Bank or McGill University or Tufts University.

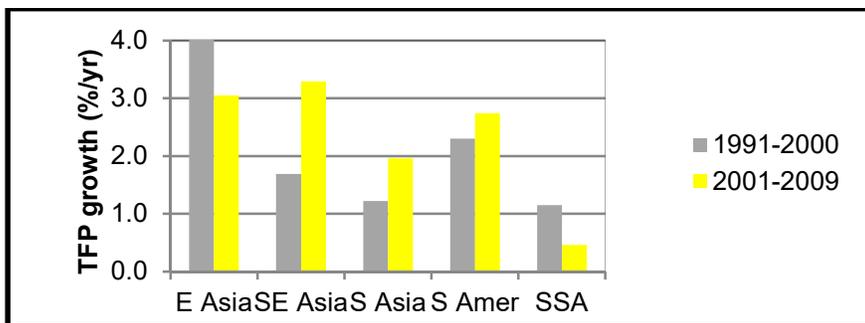
<sup>4</sup> Global agriculture towards 2050. High Level Expert Forum - How to Feed the World in 2050. FAO. Rome.

<sup>5</sup> Gollin D, Lagakos D, Waugh ME. 2014. *The agricultural productivity gap*. Quarterly Journal of Economics, Volume 129, Issue 2.

lower in agriculture than in nonagriculture for many SSA countries where labor productivity seems to be only 28% of nonagricultural labor productivity.

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 A). 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 SSA increases in production were largely the result of expansion of the area under cultivation. In the period 1990-2007, SSA is the only developing region in which the percentage of area expansion exceeded growth in yield. (Deininger et. al. 2011). This has made soils infertile and put future productivity growth at risk while putting pressure on forests.

**Figure A. Total Factor Productivity Growth in Africa**



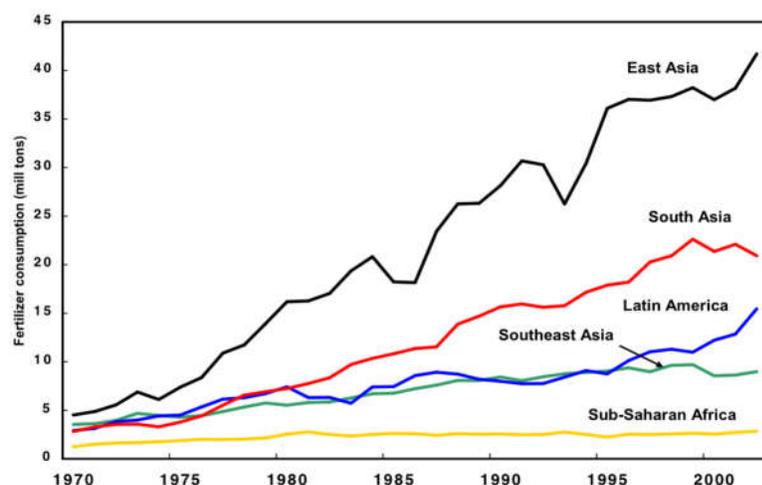
Source: World Bank 2013, based on Fuglie 2012.

Part of the reason for low crop yield is the low level of inputs. As Figure B indicates, fertilizer use—a major factor in boosting yields elsewhere—is much lower in SSA than in other regions of the world.

With respect to input use, SSA 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, Table 1). 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).

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.

**Figure B: Fertilizer Use Lags Badly in Africa**



Source: Calculated from FAOSTAT.

**Table 1. Current Yield as Percentage of Potential Yield, by Region**

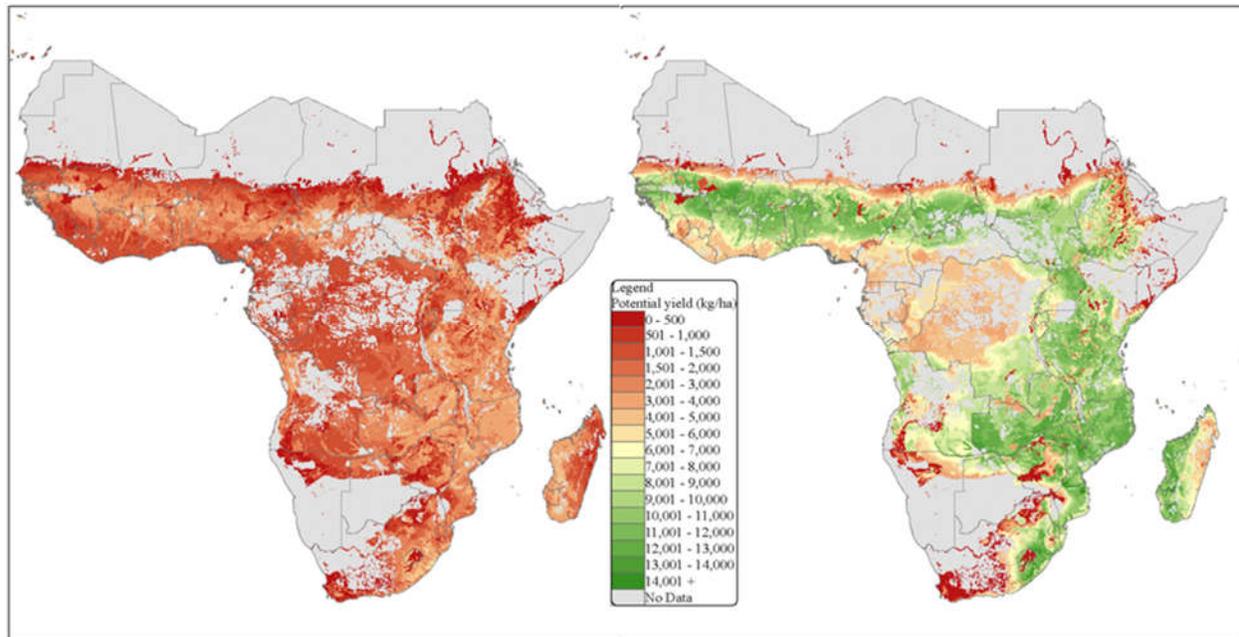
Region	Maize	Oil palm	Soybean	Sugarcane
Asia (excluding West Asia)	0.62	0.74	0.47	0.68
Europe	0.81	n.a.	0.84	n.a.
North Africa and West Asia	0.62	n.a.	0.91	0.95
North America	0.89	n.a.	0.77	0.72
Oceania	1.02	0.6	1.05	0.91
South America	0.65	0.87	0.67	0.93
Sub-Saharan Africa	0.2	0.32	0.32	0.54

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

Note: n.a. = not applicable.

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

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



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

All these aspects are closely interlinked, calling for a more comprehensive approach to delivering the SDG's. At the heart of this approach is improved agricultural productivity and climate resilience, strengthened links to markets, agribusiness growth, and rural non-farm income that can raise incomes and boost economic and rural development.

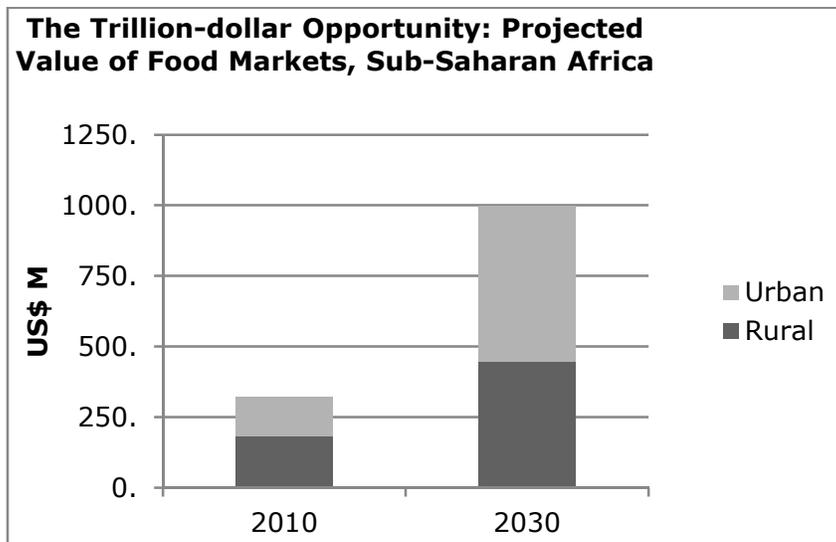
## **Opportunities**

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

- Urban food markets are booming in SSA, creating a potential trillion-dollar regional market for African producers by 2030, more than triple its current size, as Figure D shows.
- Many opportunities have been identified for profitably expanding irrigated areas and increasing the use of modern technology, 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. Many initiatives are being undertaken under the leadership of FAO and in collaboration with the African Union's 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) and reduced or eliminated overall net taxation of the sector. Through the Maputo Declaration they have also adopted a sectoral expenditure target of 10 percent of total expenditures, a figure in line with that of the Asian economies during their Green Revolution.
- Technological innovations have lowered 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.
- 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 are in place and access to capital and technology are mobilized to support the sector.
- The groundwork for climate-smart agriculture has been laid.
- Improved and improving transport and ICT infrastructure have opened access to new markets for produce and greater access to inputs and information.

**Figure D. Increases in Food Demand in Africa will be Driven Largely by Growing Urban Population**



Source: World Bank 2013.

### Transforming Sub Saharan Africa’s Agriculture

With an abundance of labor, land and untapped water, SSA has the resources necessary for a massive expansion of agricultural production. Of the world’s surface area suitable for expansion of sustainable production—that is, non-protected, non-forested land with low population density—SSA has by far the largest share, 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. Furthermore, relative to other regions, SSA has low labor costs, which should

encourage the production of labor-intensive farming-related products and services.<sup>6</sup> It also has significant locational advantages including proximity to big markets in Europe and the Middle East.

The stage is therefore set to redress the imbalances of the past and for SSA agriculture and assume its proper place as a major economic powerhouse and driver of progress. However, for agricultural transformation to occur, five main sets of issues require attention:

1. *Increasing productivity.* SSA's loss of agricultural competitiveness and export share should be reversed by maximizing yields and profitability on existing cropland rather than simply encouraging low-yield production on marginal and frontier lands.
2. *Attracting private investment.* Given that agriculture and agribusiness remains the key sector with major potential for growth, private sector opportunities at local, regional, national, inter-regional and international levels should be harnessed. Foreign direct investment in agriculture and agribusiness, when done right and transparently can transform the impact of agriculture in SSA. Cooperation among farmers is critical.
3. *Integrated value chains.* An integrated value chain that offers opportunities at various stages and includes access to finance is particularly important to attract private investment in agriculture. At present, value chains are under developed and lacking market orientation.
4. *Land tenure, use and management.* Nearly 90% of Africa's land is undocumented<sup>7</sup>. By modernizing complex governance procedures that govern land ownership and management over the next decade, SSA countries and their communities could effectively end 'land grabs', grow significantly more food across the region, and transform their development prospects. The caveat is that land deals for agribusiness must meet the most stringent test of ethical behavior and socially responsible standards.
5. *Irrigation and water management.* Lack of irrigation is one of the most important binding constraints effecting SSA agriculture. Investment in irrigation projects steadily declined in the 1980s and 1990s, partly in response to the many difficulties encountered by large-scale irrigation schemes. These included resistances due to fears of adverse environmental and social impacts of large dams, low recovery of operational 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.

Land administration and irrigation are key elements of the transformation, but investments in these areas have particularly high preparation costs. Complex regulations, limited or poorly functioning land markets, shortage of professional expertise, and concerns over land grabs and displacement of poor farmers complicate investments in land. High costs of investment in irrigation are partly explained by the need to take full advantage of instruments such as Strategic Environmental and Social Assessments to ensure that projects are socially and environmentally benign.

An African transformational shift must begin at the farm level, with producers using modern technologies. This will not happen as long as inputs in SSA remain overpriced. This problem is

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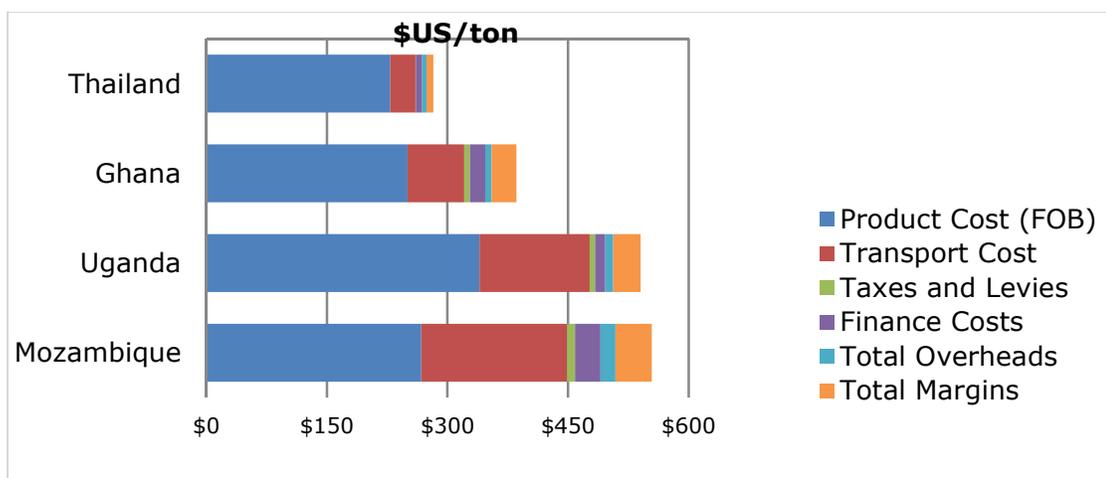
<sup>6</sup> Unlocking Africa's Agricultural Potential. 2013. World Bank

<sup>7</sup> Frank F. K. Byamugisha. Securing Africa's Land for Shared Prosperity. 2013. The World Bank

illustrated by looking at the cost of fertilizer. Almost all fertilizer used in SSA is imported. Prices in Africa are at least 30 percent higher (far higher for inland locations) than in Thailand, which also imports most of its fertilizer. A research methodology to analyze the cost of fertilizer developed by Chemonics International Inc. and International Center for Soil Fertility and Agricultural Development (2007)<sup>8</sup> used a combination of quantitative and qualitative data collection to select a sample of African countries representative. The breakdown of the cost of fertilizer in Thailand and in Ghana, Mozambique and Uganda is illustrated in Figure E. The delivered cost at the port is similar, but SSA countries sampled had higher additional costs of distribution, especially with respect to transport. These higher costs reflect poor infrastructure and trade logistics, lack of competition, and inappropriate regulations. Rather than address these constraints, subsidy programs have been a common policy response to help farmers overcome the high cost of fertilizer. However, as one might expect, such programs have tended to disproportionately benefit wealthy farmers and have often been managed in ways that crowd out the private sector.<sup>9</sup>

Experiences show that countries that have consistently implemented policies including, privatization of supply, building logistics systems to reduce the costs of import and a network of input suppliers to deliver inputs and associated services to the farm gate (Kenya is an example) have seen a steady increase in fertilizer use by smallholders as the fertilizer prices paid by farmers decline steeply in relation to import prices.

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



Source: World Bank 2013, from IFDC and Chemonics.

<sup>8</sup> Chemonics International Inc. and International Center for Soil Fertility and Agricultural Development. (2007). *Fertilizer Supply and Costs in Africa*.

<sup>9</sup> *Growing Africa: Unlocking the Potential of Agribusiness*. (2013). Washington, DC: World Bank.

## Looking Ahead

SSA agriculture is at a crossroads. Over twenty years after the Rio Earth Summit, hunger continues to rank as one of the most pernicious development challenges facing humanity. Although SSA's agricultural growth is high by (its' own) historic standards, it is not yet sufficient to meet the ambitious targets that African leaders have set and that African households want to see reflected in their own incomes.

Even in record agricultural production years, chronic food insecurity and persistently high malnutrition leave many people in SSA vulnerable to shocks. At 3.8 percent per year, agriculture is growing slightly faster than Africa's population, making more food available per capita, but too little of this growth derives from improvements in the productivity of labor and land. Demand for food—propelled by rising incomes and urbanization—still exceeds local supply, and expensive, often unpredictable imports continue to fill the gap.

SSA has steadily lost competitiveness in global export markets over the past 50 years. Up to the early 1990s, SSA as a whole was a significant net exporter of agricultural products. With the resumption of growth and the mineral commodity boom in the 2000s, imports have risen sharply to exceed exports by over 30 percent. Africa's market share for imports has increased at the same time that it<sub>SEP</sub> has lost market share in exports, contrary to the experience in Latin America and Asia, which have led world markets for both exports and imports.

Wide differences exist among countries. According to the World Bank (2013)<sup>10</sup> three countries stand out for their strong export orientation (Côte d'Ivoire, Malawi, and Kenya), whereas a number of mainly mineral dependent economies are large net importers. As seen in several developing countries, food imports generally rise along with incomes, at least until middle income status is achieved.

The increase in food imports since the mid-1970s has been particularly striking for basic foodstuffs such as dairy products, edible oils and fats, meat and meat products, sugar and especially cereals implying that food import has been increasingly important in ensuring food security (Rakotoarisoa, Iafrate, Paschali 2012)<sup>11</sup>. In addition, SSA is also a growing importer of processed foods. For example, it imports nearly US\$ 400 million of processed fruit juices and canned fruits and vegetables, suggesting major agribusiness opportunities to develop local processing capacities.

In sum, agriculture has done only a fraction of what it can potentially do to fortify Africa's growth and its resilience to shocks. As well stated in a recent FAO report<sup>12</sup> “hunger, poverty and climate change need to be tackled together. This is, not least, a moral imperative as those who are now suffering most have contributed least to the changing climate”.

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<sup>10</sup> *Growing Africa: Unlocking the Potential of Agribusiness*. (2013). Washington, DC: World Bank.

<sup>11</sup> Manitra A. Rakotoarisoa Massimo Iafrate Marianna Paschali. *Why Has Africa Become a Net Food Importer? Explaining Africa agricultural and food trade deficits*. Rome

<sup>12</sup> FAO. 2016. *The State of Food and Agriculture*. Rome

### ***Investing in agriculture to halt distress migration***

Worldwide we are confronted with immigration on a large scale. Too often, end-of-pipe solutions are favored over addressing the root causes of distress migration. This is especially important in rural areas of developing countries where around 80 percent of the world's poor and food insecure live. Rural populations are among the most vulnerable to conflict, persecution, poverty, food insecurity, a lack of employment and income generating opportunities. These factors can quickly chip away at their capacity to provide a decent life for their families or dream of a better future in their communities.

Under these circumstances, leaving their livelihoods becomes the only alternative and many times it comes at a high cost. More than 50 years ago, rural-urban migration used to be a promising alternative to find decent jobs, particularly for unskilled workers. This is not the case nowadays, as most of the cities cannot absorb them anymore. Economic opportunities are essential to allow rural populations in developing countries, including in SSA, to stay in their homes, feed their families, and lift themselves out of poverty. In SAA, investing in sustainable agriculture and rural development is an integral part of the solution to migration, as well as to fight hunger, malnutrition and poverty, and sustain peace.

### ***Towards farmer entrepreneurship***

Clearly, global food security objectives cannot be achieved without the contributions of the smallholder farmers and rural SMEs. All around the world, small farmers face common challenges in improving their productivity, livelihoods and value chain participation. These include lack of access to adequate inputs and finance, insufficient business and financial management skills, insecure land tenure and property rights, and restricted access to markets and credit. Agricultural SMEs face similar problems, their development constrained by factors such as limited access to credit, lack of collateral, low levels of technology and management skills, limited access to markets, the existence of laws, regulations and rules that impede the development of the sector, and weak institutional capacity.

The economic viability of rural SMEs and 2.5 billion small farmers worldwide is under pressure from various market failures and lack of investment that prevent them from capturing greater value from supply chains. Risks, transaction costs and weak policy environments have failed to establish the right incentives for smallholders to graduate from the subsistence level and access the market with their surplus. And yet, smallholder farmers represent the biggest untapped market for agribusiness development—one with the greatest productivity potential, if farmers can create larger and better organized groups that can compete, improve efficiency and integrate into more effective value chains<sup>13</sup> A critical issue in supporting smallholder agriculture is how to attract the necessary capital, especially from the private sector, in order to stimulate agriculture growth for food and nutrition security. A well-crafted framework built on a public-private-producers partnership model can unlock opportunities for investments and poverty alleviation.

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<sup>13</sup> IFAD Rural Development Report 2016: Fostering inclusive rural transformation. Rome.

Given the fact that there are 500 million small farms, this implies working with small producers to gain access to a reliable supply of products. The global trend towards sustainable sourcing of raw materials is driven by (i) growing interest among consumers in food safety and quality, traceability, and the production processes of the products they consume; and (ii) systematic monitoring from civil society and advocacy organizations of the social and environmental behavior of businesses. In this context, most multinational agribusiness companies have developed a sustainability strategy that analyses the long-term viability of their supply chain from multiple viewpoints (economic, environmental, social etc.). Issues that in the past were addressed as part of their Corporate Social Responsibility (CSR) agenda are now mainstreamed in the companies' basic business model. To accelerate opportunities for business towards the middle and the bottom of the smallholder pyramid, the main challenges would be to reduce the transaction costs and the perception of risk of doing business with small producers and facilitate access to finance, especially for domestic SMEs.

In this respect, a paradigm shift is needed in the way smallholder farmers in SSA are perceived and approached. They should be seen as small-scale entrepreneurs who want to grow and improve their farming businesses, and therefore provided with increased access to credit/finance, technology, and professional extension and other services.

There are signs that this is happening. There are now much better opportunities to tap private sector financing. Although formal banks currently lend little to the sector, recent experiences show that agricultural and agribusiness lending can become a profitable business for established banks. Other approaches focus on overcoming the risks of lending to the sector. Innovative ways of providing collateral, such as the use of movable assets (animals, for instance), warehouse receipts, partial credit guarantees, and equipment leasing, all reduce the risk of agricultural lending.

In the past, development cooperation mainly focused on projects initiated at the request of farmers' organizations. The modern approach draws much more strongly on the entrepreneurship of producers in developing countries, and demands active cooperation with their partners and private investors. Farmers, small holders, mid-sized and big companies, can play a key role, by forming organizations and working together. Through producers' organizations and cooperatives, farmers can improve their productivity and strengthen their position in the value chain. They can also benefit from sharing knowledge, experience and technology. This approach not only ensures better food provision but also facilitates economic and social development. In addition, a flourishing agricultural sector is also better able to develop sustainable production methods and to tackle the effects of climate change.

### *Climate change*

The impacts of climate change on SSA agriculture are already being felt and will become increasingly severe going forward. Cereal yields 1981-2002 would have been 2-3% higher in the absence of current climate change, leading to an annual production loss of 40 million tons of grain (Lobell & Field, 2007). A rise in average temperatures of 2 degrees Celsius by the middle of the century is projected to reduce expected yields by up to 20% (Lobell & Schlenker, 2010). A further surge would cause exponentially more harm. Increasingly erratic weather patterns such as more irregular rainfall amplify weather-related risks, including drought-induced food insecurity.

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.

SSA agriculture will need to adapt and improve its resilience to climate change. Various analysis show that current maize, sorghum and millet cultivars may no longer be suitable for about 40-80 percent of current cropping areas to these crops if temperatures rise 1.5°C-2°C by the 2030s and 2040s –with greater incidence of affected areas being in the Sahelian belt and in Southern Africa. Even if warming doesn't exceed 2°C, crop production could decline by 10 percent, with significant consequences for food availability and food security. Sustainable agriculture, done right, can minimize the impact of such forces with climate-smart production technologies, some of which will have the added benefit of reducing net emissions of greenhouse gases. Climate-Smart Agriculture practices such as agroforestry or livestock and pasture management will reduce the emission intensity of agricultural production as well as sucking carbon out of the atmosphere and storing it into trees and soils.

### **Agenda for Action**

Agriculture in SSA is at the cusp of a transformative opportunity. An improved policy environment has been increasingly accompanied by larger investments by the public sector, indicating a greater awareness on the part of policymakers about agriculture's potential to increase incomes, make more food available, and help protect the environment. Looking ahead, providing the transformational impact to help SSA 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 more towards more policy-oriented, and programmatic investment approaches by government and the private sector. In sum, in order to assure food and nutrition security, to build farmer livelihoods and to contribute to global food security, several parallel actions would be needed to:

- (a) *Increase agricultural productivity growth significantly.* A focus on production agriculture will not achieve its developmental goals unless it is also linked to agribusinesses, ranging from small and medium enterprises to multinational companies. The challenge is threefold: (i) develop downstream (e.g. processing) and upstream (e.g. inputs) agribusiness activities, (ii) develop commercial agriculture, and (iii) support and link smallholders and small enterprises to productive formal value chains. Good policies, sustained public and private investments, and public-private partnerships backed by open and transparent support along the value chain could make a major difference in years to come. SSA already has a number of bright spots of good productivity growth and competitiveness, such as horticulture, tea, and in some cases rice. A number of countries, including Kenya and Côte d'Ivoire, Cameroon, Ethiopia, Ghana, Malawi, and Zambia, have performed relatively well in tapping buoyant markets.

- (b) *Ensure deployment of more climate-smart agriculture practices.* Climate-smart agriculture could bring higher agricultural productivity, greater climate resilience, reduced GHG emissions (including increased carbon storage in farmland and rangeland). This also includes adoption of improved technology and access to inputs, reduced gender inequality, greater commitment to agricultural research and strengthened human resource development. A priority for SSA countries is to focus on water management, agricultural risk management, and conservation farming. 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 Climate smart agriculture is also about weather forecasting, early warning systems and risk insurance. It also seeks to highlight changes in policy that will help farmers adapt to and succeed in combating the ill effects of climate change.
- (c) *Improve gender equality and increase the productivity of women farmers.* Many smallholder farmers in SSA are women, and yet they generally do not have equal access to technology or mechanized equipment, extension services, inputs, or credit. Frequently also they are subject to different regulations covering land tenure, access and use. Evidence suggests that special attention to the needs of women famers can increase productivity substantially.
- (d) *Link farmers to markets and strengthen value chains.* This includes more inclusive and efficient value chains, policies aligned with the shifting composition of demand, improved value chain management, improved food and quality standards and expanded agribusiness growth and jobs. Value chain finance allows borrowers to benefit not only through higher lending at better terms but also by obtaining loans that reflect the cash flow pattern of their producing, processing, or trading activities. In Brazil, 70 percent of financing to commercial agriculture is provided through this mechanism. In SSA, an example of the multiple instruments that can be used in value chain finance is the Caisse des Affaires Financières (CAF) Isonga, which finances rice production in Rwanda<sup>14</sup>. CAF has introduced multiple instruments, such as production and marketing loans, voucher systems, and leases for transport. Their adoption has led to productivity increases of around 30 percent between 2007 and 2008, side selling has been eliminated, a farmers' cooperative has acquired a truck to reduce transport costs, and all farmers have a bank account compared to only 3 percent in 2003. The farmers' cooperative retains 10 percent of profits.

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<sup>14</sup> *Growing Africa: Unlocking the Potential of Agribusiness*.2013. Washington, DC: World Bank.

Such arrangements, of course, require contracts and effective enforcement, which do not work with many value chains, due to the nature of processing or markets.

- (e) *Give access to means for entrepreneurship.* This requires action on a number of fronts, including increased access to credits/finance; technologies, research and innovation; professional education and extension services; measures to de-risk and promote private sector investments; expansion of weather risk management facilities and insurance-systems; increased availability of and access to open data systems; and promotion of rural non-farm income. It also includes financial inclusion as a catalytic tool to advance human and economic development as a powerful engine of progress. Leasing could be also an alternative instrument for individuals and firms that want to acquire equipment but lack the collateral that enables access to long-term credit. Where contract enforcement and property rights are weak, the establishment of a specific leasing law is generally a pre-requisite for developing a leasing market. Other requirements include a well-functioning asset registry, reliable insurance and maintenance services for equipment, and an established market for used assets.
- (f) *Enhance the resilience of people and incomes.* To reduce risk and vulnerability greater responsiveness is needed to reduce overall food price volatility and lower the magnitude and frequency of food price spikes over time, especially given the high vulnerability of the poor, who are least able to cope.
- (g) *Improve nutritional outcomes.* Beyond food security, agriculture can make a huge contribution to better nutrition, reduced stunting, and improved childhood development across SSA. Policies and practices to ensure greater availability of food and stability of supply, gender equality, and nutrition-sensitive agricultural investments can help to reduce malnutrition and improve well-being.
- (h) *Reduce food loss and waste.* Post-production losses reduce both food security and rural incomes. Measures to reduce loss and waste, including investments in infrastructure and logistics to cut transport time and cost, improved storage capacities, and better market and price information to improve supply and product differentiation in markets, can enhance the overall food supply without GHG emissions, as well as help preserve food micronutrients. They also encourage innovation and greater investment on the part of smallholder farmers.
- (i) *Enhance environmental sustainability.* SSA and the world need a food system that makes efficient use of already limited land and water resources, is more resilient, and has a significantly lower environmental footprint. It includes lowering and reversing natural resource degradation and depletion, management of animal diseases, and a climate-smart global food system that can improve resilience to shocks.

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