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2017 I VOLUME 8 I ISSUE 3
VICE PRESIDENCY FOR ECONOMIC GOVERNANCE
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Africa's Agricultural Transformation: Identifying Priority Areas and Overcoming Challenges

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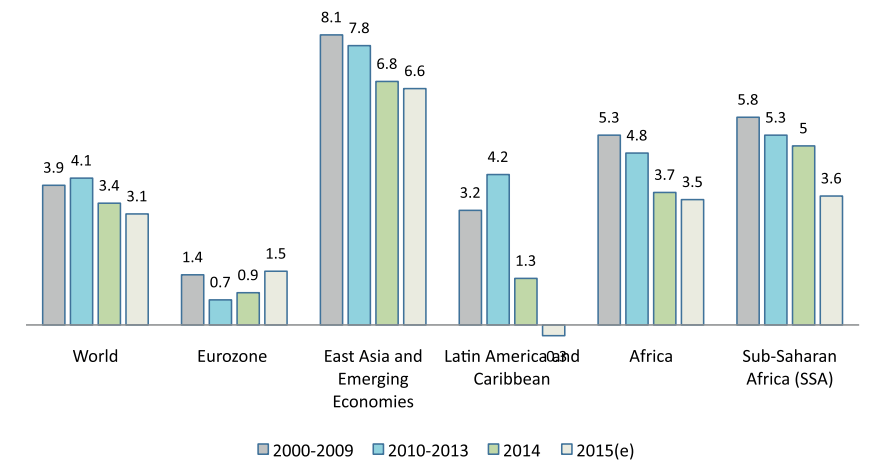
1 | Introduction

Africa has achieved unprecedented economic growth over the past two decades and is experiencing its longest period of sustained economic growth since the 1960s. The growth rate has not only accelerated, but also spread geographically. In 2015, average real Gross Domestic Product (GDP) grew by 3.5 percent, higher than the global average of 3.1 percent, and the Eurozone average of 1.5 percent (Figure 1). During the same year, five African countries were among the world's 10 fastest-growing countries with real GDP growth of 7 percent or higher[2]. In spite of global and regional headwinds that have characterized the recent global economic landscape, Africa's economic performance has remained resilient and its mid-term prospects appear favorable. This has ushered in hopes for the continent's development prospects and its place as a new driving force of world's growth.

Figure 1 Real GDP Growth (percentage per annum)



Source: Annual Report 2015, AfDB.
Notes: Emerging and developing Asia in World Economic Outlook's classification.
e: estimates.

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These favorable macroeconomic performances were expected to spill over to the agricultural sector, the backbone of livelihoods and employment for most Africans. Indeed, agriculture currently employs 65–70 percent of the African workforce, supports the livelihoods of 90 percent of Africa's population, and accounts for about a quarter of the continent's GDP (OECD and FAO, 2016; World Bank, 2016). The importance of the agricultural sector is such that agricultural growth in sub-Saharan Africa is more effective in reducing poverty than growth in non-agricultural sectors. Christiaensen and Demery (2007) found, for instance, that overall Africa's GDP growth originating from agriculture was respectively 2.7 and 2 times more effective in reducing poverty in the poorest quarter and in the richest quarter of African countries, respectively, in their sample than growth from non-agricultural sectors. The place of agriculture in Africa's economy cannot, therefore, be overemphasized, and improving the quality and standards of life of Africans will ultimately involve enhancing agricultural performance.

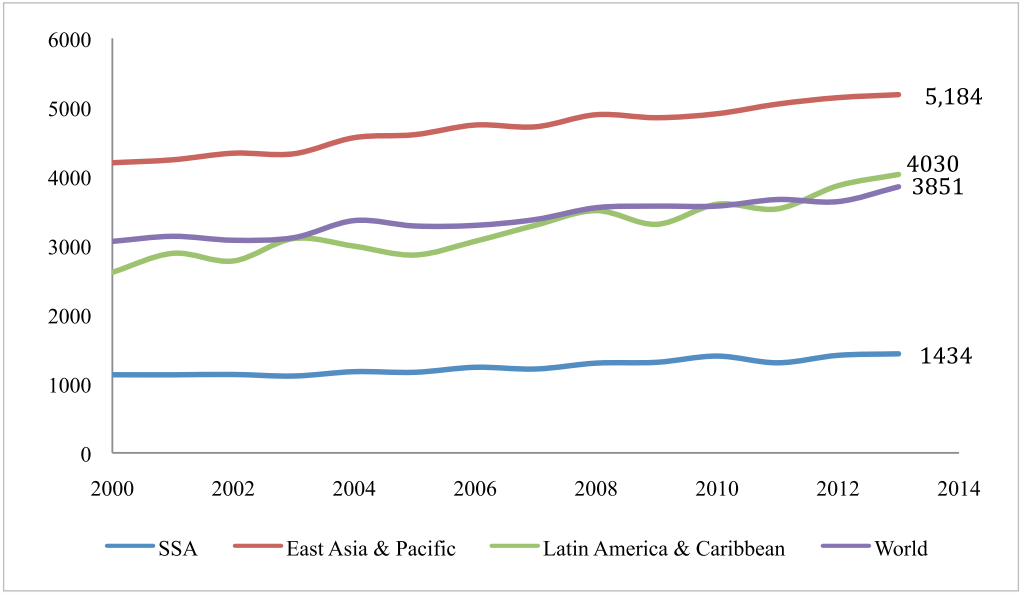
The above notwithstanding, Africa's agricultural sector still performs poorly, and its enormous potential remains untapped. The continent still lags behind other regions of the world in terms of productivity, agricultural mechanization, advisory and extension services, and access to credit and financial markets. For instance, cereal yield has only slightly improved in SSA since 2000 and in 2014 it was estimated at around 1,430 kg per hectare of cultivated land, compared to 4,000 kg per hectare in Latin America and the Caribbean, or 5,200 kg per hectare in East Asia and the Pacific (Figure 2).

Furthermore, the recent improvements in the sector in terms of adoption of modern inputs (such as fertilizer, improved seeds, and pesticides), agricultural mechanization, or access to advisory services have been insufficient to harness the continent's huge agricultural potential and trigger significant poverty reduction. Consequently, Africa remains the world's most food-insecure region with more than one out of four Africans being undernourished, and the proportion projected to increase by 33 percent, from around 240 million in 2015 to around 320 million in 2025 (OECD and FAO, 2016). Moreover, Africa is the only region of the world where the absolute number of people living below the international poverty line of US$ 1.90 a day increases, with the most optimistic scenario showing about 330 million poor in 2012, up from about 280 million in 1990 (Beegle et al., 2016). Agro-ecological zones such as the Sub-Humid Guinea Savannah and Semi-Arid Sahel regions are among the most vulnerable.

Despite the continent's endowments with abundant arable land (200 million hectares of uncultivated arable land, close to half of world's availability) and vast water resources (17 rivers with catchments areas greater than 100,000km2 and more than 160 lakes larger than 27km2), Africa's agricultural sector is unable to supply enough food to the continent (UN-Water, 2000). As a result, the region has become a net food importer since the mid-1970s (Rakotoarisoa et al., 2012). The resulting food import bill of US$ 48.5 billion in 2016, expected to skyrocket to over US$ 110 billion by 2025, has crowded out expenditures for other crucial economic sectors such as education, health, and infrastructure.

In view of the foregoing, there is a broad consensus on the need for a rapid transformation of Africa's agriculture in order to accelerate the continent's development and the pace of inclusive and sustainable economic growth. A more radical economic transformation is needed, and the agricultural sector can perfectly kick-start the process. If well managed and implemented, agricultural transformation has the potential of overcoming many of Africa's economic challenges by supporting growth, promoting inclusion, and reducing poverty. It also has the virtue of relieving recurrent human challenges on the continent by fostering food security and improving nutrition and related health issues. The transformation of Africa's

Figure 2 Cereal yield, kg per hectare



Source: World Development Indicators 2016, World Bank.

agricultural sector could, therefore, be a driver of the overall economic renaissance on the continent, setting off a virtuous circle of mutual cross-sector benefits.

This paper briefly examines the question of agricultural transformation in Africa, identifies some priority areas to achieve such transformation, and discusses challenges facing African countries in their efforts to overcome structural impediments to agricultural development. The paper further proposes policy recommendations in regards to the identified priority areas of intervention and highlights the particular role that the African Development Bank has played to help African countries leapfrog their agricultural transformation.

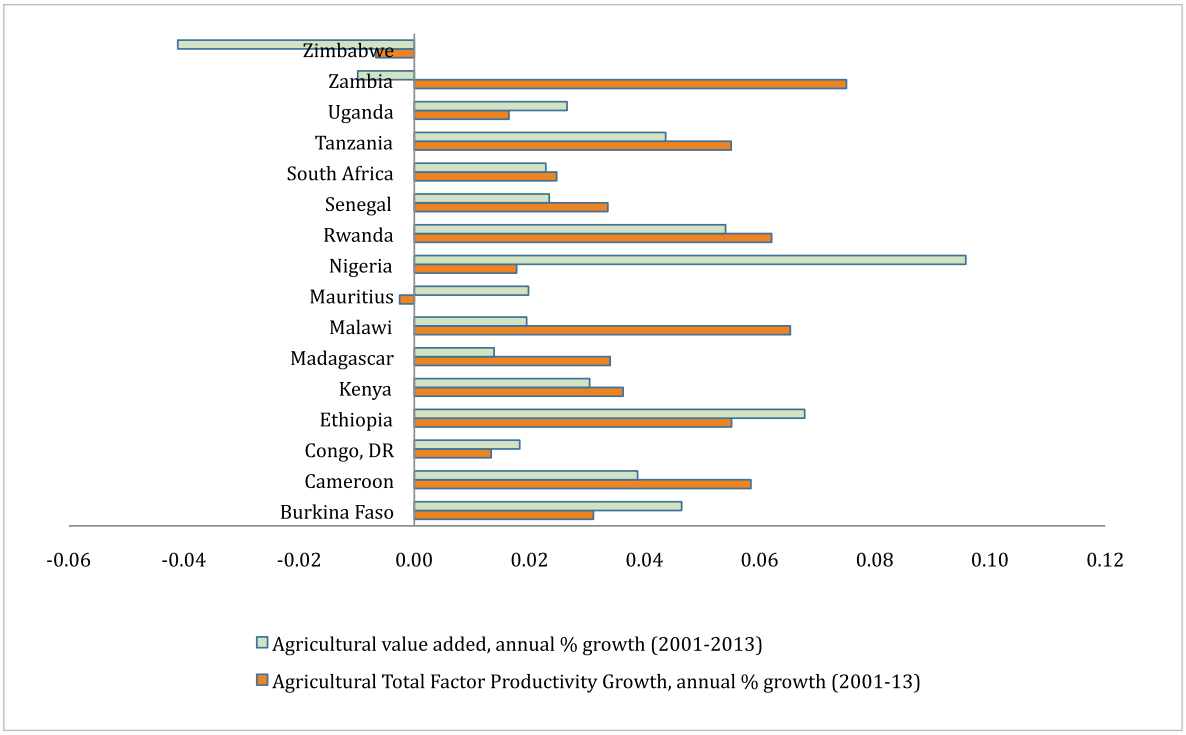
2 | Agricultural transformation and economic growth in Africa

Though there is no universally accepted definition of agricultural transformation, there exists, however, some key guiding principles to help grasp its scope. Put simply, agricultural transformation can be understood as the process through which farms slowly but gradually move from highly diversified, subsistence-oriented production systems towards more specialized and business-oriented production processes (AGRA, 2016). In particular, it involves productivity growth, which itself depends on increased uptake of modern technologies and inputs that improve the productivity of land and labor. It also entails tangible progress in remedying imperfections in labor, land, and financial markets that impede technology adoption, as well as efficient resource allocation and investment. It further requires improved efficiency and value addition in connecting farmers to markets, as well as enhanced resilience in the face of growing risks due to climate, market, and political shocks.

Available data reveal that agricultural transformation is already underway in several African countries, though at various stages. Several studies have indeed provided evidence of employment shifts and labor exits from agricultural to non-agricultural sectors in most African countries, a crucial pattern of agricultural and structural transformation (Proctor and Lucchesi, 2012; de Vries et al, 2015; Yeboah and Jayne, 2016; McCullough, 2016; Diao et al., 2017). Using data from the International Labour Organization (ILO), Proctor and Lucchesi (2012) found for instance that the share of agriculture in total employment in SSA has declined by about 3.4 percentage points between 1999 and 2009. Similarly, de Vries et al. (2015) found that, between 1990 and 2010, the share of agricultural employment in 11 SSA countries declined from 61.6 to 49.8 percent.

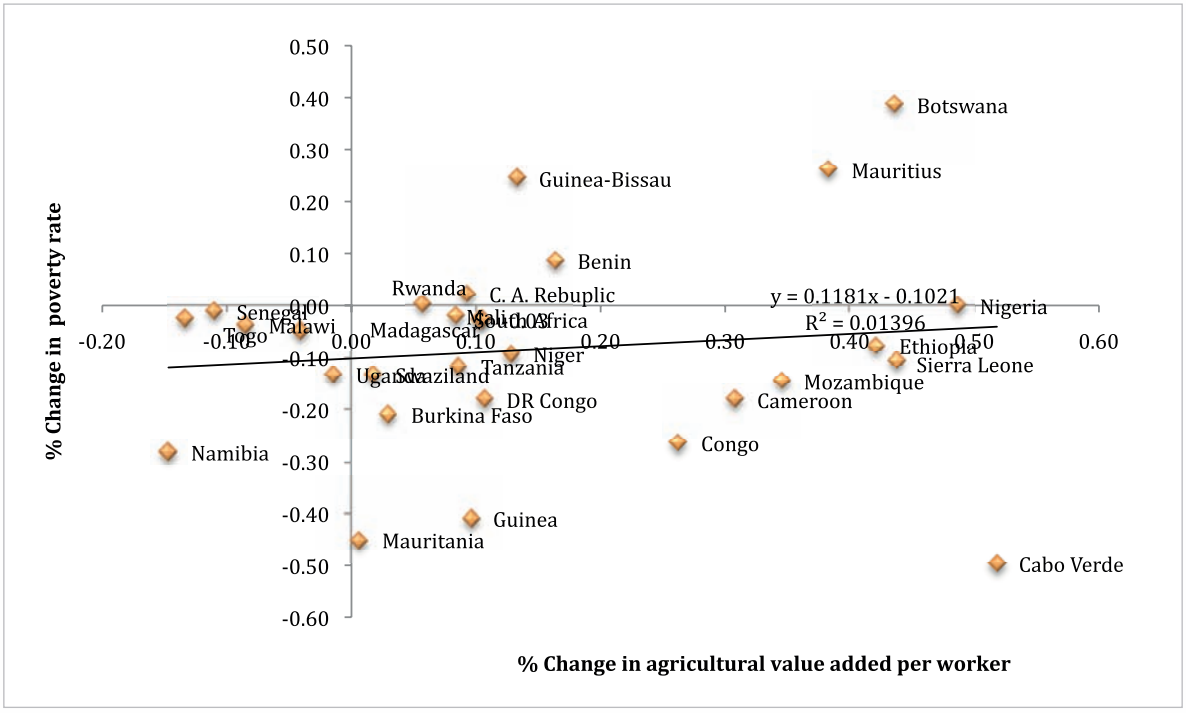
Moreover, since 2001, much of Africa has enjoyed a sustained growth of agricultural value added. Figure 3 shows in fact that average annual growth rates of agricultural value added per worker and total factor productivity have been positive for most of the countries where data are available. The improvements in agricultural performance can also contribute to the reduction of poverty, especially in areas where the workforce is mostly engaged in agriculture. As shown in Figure 4, most countries that experienced a positive growth of their agricultural productivity also enjoyed a reduction in their national poverty rate. However, the relationship between

Figure 3 Annual growth in agricultural value added and total factor productivity, 2001–2013, selected African countries



Source: World Development Indicators (2016) for agricultural value added and Fuglie (2012; 2015) for Total Factor Productivity.

Figure 4 Pourcent changes in agricultural value added per worker and in poverty rates, 2000-2014, various African countries



Source: World Development Indicators (2016) for agricultural value added per worker and Povcalnet for poverty rates.

agricultural productivity growth and changes in poverty rates appears weak (R2=1.4%), suggesting other important factors must be at play.

Agricultural transformation can affect economic growth through at least three channels. First, agricultural growth has the potential to contribute to economic growth through a multiplier effect on domestic sectors with links to agriculture (Snodgrass, 2014). In particular, growth in the agricultural sector will increase demand for goods and services from other sectors in terms of modern inputs (such as fertilizer, improved seeds, and other agrochemicals), transport, and fuel. Furthermore, growth of agricultural output will help downstream industries (essentially the food-processing sector) to overcome recurrent supply shortages. Therefore, the larger the value of the multiplier effect in agriculture, the higher the contribution of the sector to economic growth. Existing empirical studies conducted between 1989 and 2014 have measured the magnitude of the agricultural multiplier in SSA at an average of 1.5, implying that an US$ 1 increase in agricultural income, brought about by agricultural investment, innovation or technological change, has the potential to raise national income by US$ 1.5 (Haggblade, Hazell, and Brown, 1989; Block and Timmer, 1994; Delgado al, 1994; Dorosh and Haggblade, 2003; Farole and Winkler, 2014). This effect is slightly less than estimates for Asia (1.6-1.8).

Second, agriculture is linked with economic growth through its impacts on factor markets. Indeed, successful transformation of Africa's agricultural sector, through increased investment and technological change, means that less workforce will be needed to achieve the same agricultural output. The resulting labor surplus can be utilized by other sectors.

Finally, agricultural transformation impacts on economic growth through increased consumption from households engaged in agriculture as their incomes rise. This, in turn, will create demand in non-agricultural sectors, which will further raise overall demand in the national economy and fuel economic growth.

In addition, agricultural transformation can also be a crucial tool of achieving inclusive growth in Africa. It can be an important means of promoting inclusive growth on the continent by stimulating employment, boosting income and investment, and subsequently helping achieve better living standards from the marginalized engaged in agricultural activities. Promoting agricultural growth through sustainable agricultural transformation may, thus, spur economic development for a large number of people, relying or not on agriculture to survive.

However, unlike structural changes undergone in East Asia where agricultural labor exits were accompanied by rapid increases in manufacturing, African workers who leave the agricultural sector are going into the services sector (Diao and McMillan, 2014; Kormawa and Jerome, 2015). As a result, the contribution of the manufacturing sector to SSA's GDP is lower today than during the 1980s, suggesting that the

continent is in fact de-industrializing. Since the 1980s, the share of manufacturing has declined gradually, from 14.3 percent on average in the 1980s, to 12.5 percent in the 1990s, and 10.8 percent between 2000 and 2015 (World Bank, 2016).

To strengthen the link between agricultural growth, economic growth, and poverty reduction in Africa, a structural transformation of the agricultural sector is much needed, particularly in key priority areas where the continent still lags far behind other regions. These priority structural changes include, among others, strengthening Africa's agricultural value chains, increasing the rates of agricultural mechanization, improving the participation of youth and women in agriculture, reinforcing institutional capacity of African countries, promoting climate-smart agricultural practices, and strengthening intra-African agricultural trade.

3 | Priority areas for Africa's agricultural transformation

3.1 Agricultural value chains

Africa is currently at the bottom of global agricultural value chains, exporting goods with very little or no processing. Its agricultural value chains tend to be dualistic, including an informal component (serving essentially lower-income consumers in local markets) and a formal component (made up of large farms and processors that offer products to higher-income domestic consumers) more or less connected (Webber and Labaste, 2011). Effective supply chains, both up and downstream, and strong interactions between the informal and formal value chains, may create opportunities for actors at each stage of the agricultural value chain, improve their gains, and enhance their living standards.

Improving the performance of Africa's agricultural value chains is also required for agricultural transformation and inclusive growth. The absence of a strong and efficient agricultural value chain implies that many African countries risk being ensnared into producing low-skill, low-value products and services, thereby struggling to obtain a significant value-added share in global trade. Africa still marginally affects the international agricultural export markets and its share of global agricultural exports has declined gradually from almost 10 percent four decades ago to around 2 percent today. On the import side, sub-Saharan Africa remains the only developing region that has seen its share of world agricultural imports increase rather than decrease, creating imbalances between export revenues and import bills. These imbalances have undermined both the scope of economic growth and its redistributive capacity and should be addressed for a successful agricultural transformation and, sustained and inclusive growth.

In order to transform its agricultural sector and promote sustained inclusive growth, Africa therefore should aim at climbing the global agricultural value chain. This objective is within Africa's grasp, given its huge untapped agricultural potential and opportunities arising from steady increases in Africa's food markets, population growth, rapid urbanization and strong middle class. Indeed, Africa's private consumption reached US$ 1.4 trillion in 2015 while households and businesses are projected to spend US$ 2.1 and US$ 3.5 trillion by 2025, respectively, totalling US$ 5.6 trillion of market opportunities for actors along agricultural value chains (McKinsey & Company, 2016). Compared to other regions of the world, Africa's private consumption was the fastest growing, at 5.8 percent per annum between 2000 and 2005 and 5.2 percent a year from 2005 to 2010, before falling to 3.9 percent between 2010 and 2015. The recent increase in the number of supermarkets across Africa has also had a sizeable effect on Africa's agricultural value chain dynamics, particularly for niche-markets and buyer-driven chains which have then proliferated.

Finally, high population growth, rapid urbanization, and the emergence of a strong middle class can help support Africa's agricultural value chains. Estimated at 1.19 billion inhabitants in 2015, Africa's population is projected to rise to 2.48 and 4.39 billion by 2050 and 2100, respectively, which is the highest rate of population growth in the world (UN, 2015). Moreover, while only 40 percent of Africans lived in urbanized regions in 2014, the continent is expected to urbanize faster than other regions of the world in the coming decades, with 56 percent of urban populations by 2050. Africa's middle class is also fast-growing and has more than doubled between 1990 and 2010. These changes in population profiles and the rise of a middle class with a growing purchasing power will lead to dietary changes and will affect various segments of food supply chains on the continent, which actors at different stages of the agricultural value chains can leverage. Projections by the World Bank suggest indeed that African urban food markets would increase four-fold to exceed US$ 400 billion by 2050, offering opportunities to agriculture and agribusinesses and boosting job creations, increasing income, and improving populations' livelihoods (Byerlee et al., 2013).

3.2 Agricultural mechanization

Agricultural mechanization stands for the application of mechanical technology and increased power to agriculture aiming at enhancing the productivity of labor and achieving results that surpass human capacity. Almost all countries that have overcome the challenges of development did so through strong support for mechanization and heavy investments in both animal traction projects and powered mechanization. Experience from other regions of the world, especially Asia and Latin America, shows that investments in agricultural mechanization have been key to enabling farmers to intensify their production, enhance their efficiency, and improve their productivity and quality of life.

Agricultural mechanization is also an imperative to transition from subsistence-oriented production to agribusiness. The rapid expansion of agricultural machinery use has helped many countries in Asia and Latin America transform their

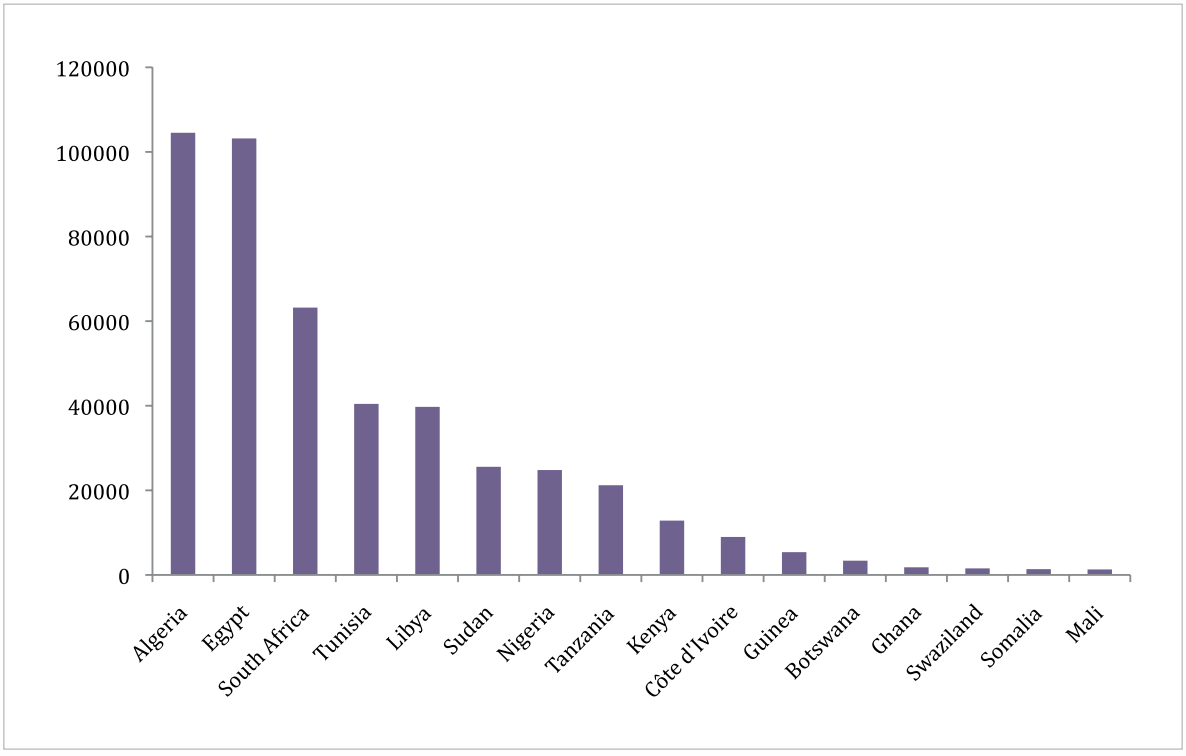
agricultural sector, originally subsistence-oriented, into a progressively commercial and internationally competitive industry. In that regard, Africa is still performing poorly. In fact, the rate of agricultural mechanization is dismally low, at around 13 tractors per 100 km2 of land, compared with the global average of 200 tractors (World Bank, 2016). Between 1961 and 2000, the number of tractors utilised by SSA farmers grew by only 28%, compared with 470% in Latin America and the Caribbean and 500% in Asia (FAO, 2008). If Africa wants to be food self-sufficient, export its food surplus, and keep up with the future nutritional needs of its burgeoning urban population, drastic increases in agricultural mechanization rates are of utmost importance. As highlighted in Figure 5, the use of agricultural tractors on the continents is largely concentrated in North African countries and South Africa, followed by large countries with large commercial farming sectors such as Nigeria, Tanzania, and Kenya, while farmers from other African countries barely use agricultural tractors.

Agricultural mechanization can also help improve the health conditions of African farmers. Indeed, African agriculture still overwhelmingly relies on human muscle power, using hoes and other handheld tools. During the last decade, animal and tractor power have even decreased in African agriculture, amplifying the reliance of the sector on manual methods. Besides the obvious severe limitations of such agricultural methods for farm productivity, they are also accompanied by severe health problems for farmers. The resulting medical bills, if very high, can crowd out other family expenditures such as education and food, leading to a vicious circle of poor health, low farm production, low income, and low consumption.

Furthermore, Africa can leverage its vast untapped land and water resources to speed up the pace of agricultural mechanization. Africa is indeed home to 25 percent of the world's fertile land, but accounts for only 10 percent of global agricultural output. Africa has thus the potential to triple the value of its annual agricultural output, from US$ 280 billion today to around US$ 880 billion by 2030 (McKinsey & Company, 2014). It also has substantial water resources, but less than 5 percent is used, and only 6 percent of its fertile land is irrigated. Africa, therefore, offers greater potential for agricultural machinery sales and represents a promising market for prospective investors in its farm machinery industry.

Finally, competition between suppliers of agricultural machinery has also led to cheaper and more affordable farm machinery suitable for African conditions. The emergence of new suppliers, especially from newly industrialized countries such as China, India and Brazil, provides new sources of tractors and other farm machinery at affordable costs. The increased availability of these agricultural engines can help African farmers increase the efficiency of their agricultural production, reduce post-harvest losses, increase their farming revenues, and transition in the near future to business-oriented agriculture.

Figure 5 Number of agricultural tractors in use, most recent available estimates, 2000-2008



Source: FAOSTAT (2016), http://faostat3.fao.org/download/I/RM/E.

3.3 Youth and women

In most African countries, women make substantial contributions to the development of African agriculture and rural activities. Recent estimates show that the share of economically active women working in African agriculture stands at a striking 62 percent, compared with an average of 43 percent in other developing countries (FAO, 2011). Consequently, agricultural transformation and subsequent economic growth cannot be achieved without women's involvement into the process.

On the other hand, youth are Africa's greatest assets for its agricultural transformation and growth. Africa's youth population is rapidly growing and expected to double to over 830 million by 2050. While other regions of the world, particularly developed countries, experience aging problems, SSA's population is instead rejuvenating, with its median age declining between 2010 and 2015. Sub-Saharan Africa has currently the world's youngest population and is home to over 420 million young people (Brooks et al., 2014). Two out of three inhabitants are under the age of 25 years, and 44 percent of SSA's population is under the age of 15. About 70 percent of the youth reside in rural areas and employed African youth work primarily in the agricultural sector, where they account for 65 percent of the workforce (AGRA, 2015).

Young African, men and women, are critical to the transformation of agriculture on the continent and for efforts to ensure food security. Owing to their relative importance, youth and women represent a driving force for Africa's agriculture. They are becoming well educated, better equipped and empowered to meaningfully contribute to the socioeconomic development of their respective countries. Based on current trends, 59 percent of 20-24 year olds will have had secondary education in 2030, compared to 42 percent today. This will translate into 137 million 20-24 year olds with secondary education and 12 million with tertiary education in 2030 (FAO et al., 2014). To reap the benefits of the "demographic dividend" or youth bulge experienced across the continent, youth and women must take the central stage in all policies and strategies aimed at improving the performance of Africa's agricultural sector. If youth and women are not brought on board, the transformation of Africa's agriculture can only be incomplete and non-inclusive. The increase in the working age population on the continent could support increased productivity and stronger, more inclusive economic growth. Increases in youth employment, particularly in the agricultural sector can lead to increased incomes, higher living standards for the community, and better health and education outcomes. Youth employment also has the potential to fuel inclusive growth for African countries (ILO, 2013). It is estimated that lowering the youth unemployment rate to that of adults' would translate to a 10 to 20 percent increase in Africa's GDP, an increase that could be used to achieve sustained inclusive growth (UNDP, 2015; AfDB et al., 2012).

Finally, Africa's vibrant youth and women's resilience present a great opportunity to address the constraints and challenges holding back improvements in agricultural productivity. By leveraging the energy, strength, enthusiasm and dynamism of Africa's youth and channelling these strengths into more profitable, productive, and competitive agribusinesses, African countries can enjoy increased productivity, enhanced food production system, and increased agricultural incomes. Agriculture also offers many attractive employment opportunities to youth and women, in terms of input supply markets, ICTs, processing, transport, marketing, or retailing along the agricultural value chain. The participation of youth and women in agriculture and agribusiness can therefore boost economic growth and help reduce poverty and food insecurity across the continent. This will require that no effort be spared to mobilize, educate, and equip the youth and women with the necessary skills and tools for agricultural transformation.

3.4 Institutional capability

Strong and efficient institutions occupy a central stage in facilitating and driving the agricultural transformation agenda. They are mandated to ensure delivery of agricultural inputs, resources, and services necessary for agricultural modernization and transformation (Alence, 2004; Dorward et al., 2004). Where they function well, they also ensure an optimal distribution of income among various actors and contribute to enhancing growth and sharing it equitably among citizens.

There is also a strong correlation between the quality of institutions and the effectiveness of agricultural policies, strategies and outcomes. Good quality institutions facilitate and streamline the rules of the game for actors at various stages of the agricultural value chains (farmers, agro-processors, agro-dealers, agropreneurs, or industrialists) which in turn help to modernize and transform the agricultural sector. They are instrumental in increasing productivity and production, adding value and reducing harvest loss, by facilitating the formulation, implementation, and reinforcement of developmental policies. Improving governance and accountability of African institutions is, therefore, a must for the agricultural transformation and inclusive growth agendas (Haile-Gabriel, 2015).

Moreover, good institutions are instrumental for pro-poor agricultural and inclusive growth (Dorward et al., 2004). Historical evidence suggests that good institutions played a crucial role in enhancing poverty-reducing agricultural growth and redistributing riches among citizens. Governments in countries such as South Korea and Japan have managed to put into place policies, supported by a strong and efficient bureaucratic apparatus, that enhanced agricultural outcomes, farmers' incomes, and tightened the gap of living standards between farming and non-farming citizens. They were influential in helping their agricultural sector achieve successful transformation, in reducing income inequality between rural and urban regions, and in implementing inclusive policies.

Recent continental initiatives show that there are renewed political commitments of African leaders to improving agricultural governance and performance. African leaders have recently showed renewed interests in elaborating strategies aimed at

boosting agricultural performances, increasing its competitiveness, and improving its governance. Launched in 2003, the Comprehensive Africa Agriculture Development Programme (CAADP) of the Africa Union (AU)'s New Partnership for Africa's Development (NEPAD), represents a continent- wide effort to improve agricultural policies and which ultimate goals are sustainable agriculture growth and poverty reduction. Commitments made in the 2003 Maputo Declaration and the 2014 Malabo Commitments through the CAADP are evidence of African countries' increased ownership and leadership in designing and implementing agricultural initiatives. Other initiatives such as the Alliance for a Green Revolution in Africa (AGRA) launched in 2006, the Grow Africa Initiative of the AU, the NEPAD, the World Economic Forum in 2011, the Agenda 2063 of the AU in 2013, the AfDB's High-level conference on "Feed Africa" in October 2015, and the AfDB's "Feed Africa" Strategy in 2016, are among those initiatives and action plans wherein African leaders increasingly strive to modernise agriculture for increased production, productivity, value addition, and shared prosperity.

Finally, in most African countries, civil society and other private sector actors now increasingly play a safeguarding role to ensure accountable institutions. Owing to their technical expertise, proximity to the population and increasing presence in the field, civil society organizations (CSOs) have played a crucial role in the fight against hunger, malnutrition, and poverty. Their views and opinions have also helped enhance the legitimacy, transparency, and accountability of public institutions across the continent. On the other hand, private sector entrepreneurs have also brought their capital to supply agricultural inputs and machinery, invest in agricultural projects, and co-finance soft and hard infrastructure. Their partnership with public authorities have thus permitted more transparent institutions, enhanced governance, and promoted more accountability.

3.5 Climate-smart agricultural practices

The negative effects of climate change on agricultural outcomes are now well documented, and recent studies have shown that these effects will be disproportionally higher in Africa than in other regions of the world. Some parts of SSA are expected to suffer the most, with decreases in agricultural productivity expected to turn around 15-35 percent (Fischer et al., 2005; Stern, 2006; Cline, 2007; Barnard et al., 2015). Others will experience increased water and food shortages, shorter growing agricultural seasons, increased frequency of drought and flooding, and possibly reduced suitability to agricultural activities. Owing to the escalating challenges of climate change, environmentally friendly agriculture is, therefore, a must for African countries. It is a promising way to sustainably increase agricultural productivity and farmers' income, adapt and build resilience to climate change at each level of the agricultural value chain, and develop concrete strategies for the reduction of greenhouse gas emissions from agriculture.

Furthermore, by identifying suitable strategies to perform agriculture without sacrificing future generations, climate-smart agriculture is well-suited to promote long-term inclusive growth on the continent (Branca et al., 2012). Farmers engaged in environmentally friendly agriculture will strengthen their livelihoods and food security through improved management of land and inputs and adoption of climate-resilient technologies. For African governments to succeed in their challenges of addressing both food security, sustainable development, and climate change, investments in climate-smart agriculture may be an important asset, and institutional and financial support will be required to enable African smallholders to transition to climate-friendly agricultural practices.

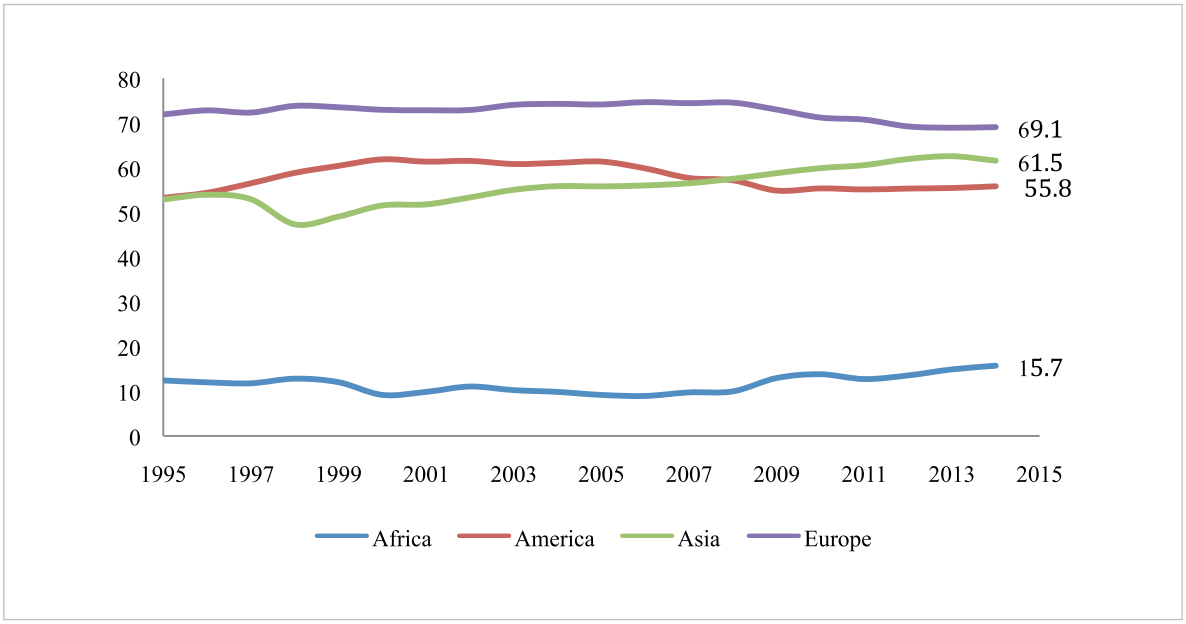
Finally, across the continent, there is now a clear public awareness on climate change and the urgent need to develop adaptive and mitigating strategies. The devastating effects of climate change on Africa's agriculture, which is essentially rain-dependent, have prompted African leaders to take urgent measures to help their farmers adapt to and mitigate climate change. This public awareness has led to the inclusion of CSA in the NEPAD programme and to the development of the African Climate Smart Agricultural Coordination Platform, as well as the African Climate Smart Agriculture Alliance in 2014. As a result, the total area under CSA management on the continent has increased from virtually zero in the early 2000s to around a million hectares, leading to better yields, higher profitability, less vulnerability for women involved, and better soil fertility and conservation. The adoption of CSA practices by other countries offers Africa's farmers a great opportunity to increase their productivity while adapting to and mitigating climate change.

3.6 Intra-African trade

In an increasingly globalized world, African agriculture can benefit from a vibrant trade between neighboring and/or African countries. Agricultural regional integration can help expand existing markets, create new ones for national farmers, and enable new opportunities for growth. Further, the integration can promote competitive and more diversified economies and attract new sources of investment. Farmers from one country can seize the opportunity to learn from others and share their own experiences in agricultural practices. In this win-win game, African countries will not only harness the full growth potential of their agricultural sector by reaping the benefits of larger marketplaces, but also ensure that the fight for sustainable agriculture is widespread across the continent. By collaborating and sharing knowledge, African farmers can improve their productivity and speed up their path towards sustainable agriculture and inclusive growth (UNCTAD, 2013).

However, the level of intra-African trade is still dismally low compared to the levels achieved by other regions of the world; as shown in Figure 6, intra-African trade stood at around 15.7 percent in 2014, compared to 69.1 percent in Europe, 61.5 percent in Asia, and 55.8 percent in America. Even if Africa's unrecorded informal cross-border trade is accounted for, intra-African trade is not likely to exceed 20 percent.

Figure 6 World intra-trade, by region



Source: UNCTAD, http://unctad.org/en/Pages/statistics.aspx

Furthermore, a strong intra-Africa trade can provide a cushion against external agricultural shocks. The heavy reliance of Africa on international trade and the concentration of its exports on primary commodities imply that the continent is particularly vulnerable to external shocks and protectionist trade policies. This problem is particularly acute in the agricultural sector, especially as the continent has been a net food importer since the mid-1970s. The recent global food price crisis has blatantly demonstrated the extent of vulnerability of Africa's economies. Indeed, while high global food prices of 2007-2009 and 2011 might have played an important role in the "Africa Rising" narrative and largely explained Africa's exceptional GDP growth, the recent fall in food commodity prices has seriously affected its foreign exchange earnings, shrunk revenues of its agricultural net sellers, and prompted labor exits from its agricultural sector. Though Africa cannot delink itself from international trade, it can significantly reduce its vulnerability to external shocks by improving the performance of its regional trade. Boosting intra-African trade and deepening regional market integration, therefore, constitute vital and timely responses to the multifaceted challenges of agricultural transformation on the continent.

In recent years, African leaders have made significant strides to harness the enormous potential of intra-regional trade, create employment, catalyze investment and foster economic growth. At the African Union Summit in January 2012, for instance, African leaders committed to boosting intra-African trade and fast-tracking the establishment of a continental free trade area. Some Regional Economic Communities (RECs) have also succeeded in achieving their stated objectives (AU, 2012). Hence, the Southern African Customs Union has made significant progress in allowing for the free movement of production factors, in creating a common tariff on goods from external countries, and in eliminating intraregional barriers. The West African Economic Monetary Union has also established a shared accounting structure and has put in place a stock exchange that spans the region. There is, therefore, room for other RECs, such as the Economic Community of the Great Lakes Countries and the Economic Community of Central African States to succeed in their attempts to eliminate trade tariffs on products made within their regional member countries.

Increases in income and in the size of Africa's middle class indicate that there is a great potential for regional agricultural trade. The expansion of intra-African trade offers an opportunity for African countries to exploit the economies of scale associated with larger markets and overcome the lack of export competitiveness due in part to the small size of their economies. Increases in income and size of Africa's middle class imply that there is already a market for African enterprises to exploit within the continent without having to overcome the burden associated with distant markets in Europe, Asia, and America.

Finally, unexploited opportunities for intra-African trade exist in many product categories, particularly for food and agricultural products. Though around 70 percent of African countries are net food importers and 40 percent net importers of agricultural raw materials, only about 15 percent of Africa's world trade in food and live animals occur within the continent, while on average only 21 percent of African food exports take place within the continent. This means that there are plenty of opportunities for regional trade in food and agricultural products that are not being exploited by African countries.

4 | Challenges to Africa's agricultural transformation

Though full of enormous potential, Africa's agricultural sector is still enmeshed in numerous challenges that impede its structural transformation.

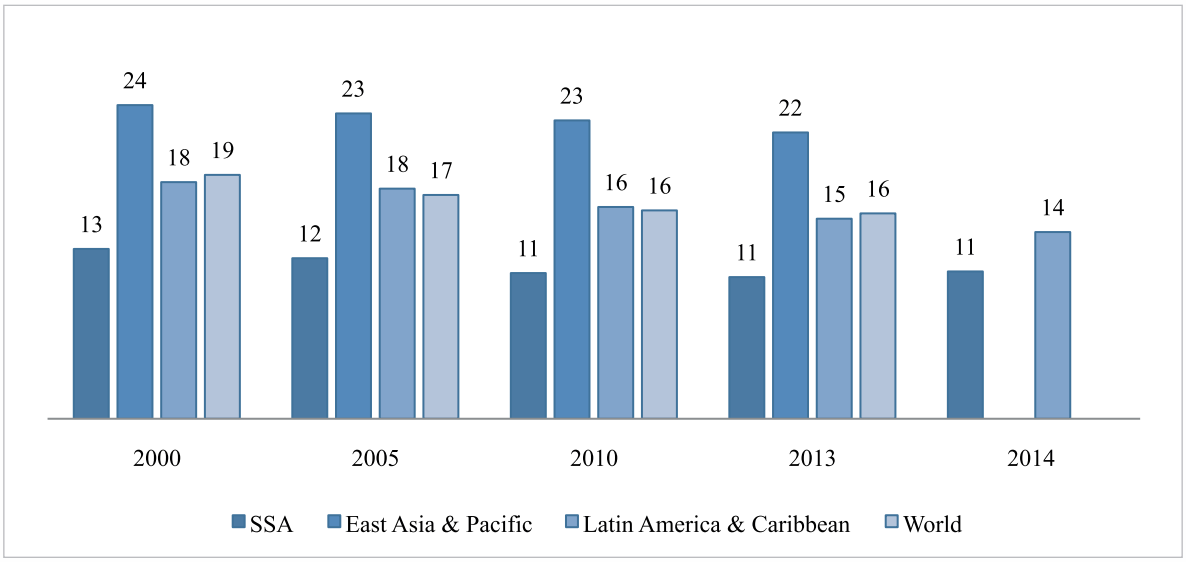
First, the structural changes undergone by many SSA countries have not been accompanied by the emergence of a diversified and buoyant manufacturing sector. The ratio of value added in agribusiness to that of farming remains the lowest in the world, at 0.6, compared for example to 5 in Latin America or 13 in the US. Moreover, across agricultural value chains, very little processing takes place on the continent, leading to substantial losses for exporters. For example, Africa produces approximately 70 percent of the world's raw cocoa beans by weight, but only 16 percent of intermediate cocoa products, which are typically worth 2-3 times more per ton than raw cocoa (AfDB, 2016b). Most indicators of industrial development have deteriorated in recent years: Africa's value added in manufacturing per person was the lowest in the world, at only US$ 45 in 2011, less than a third of South and Central Asia; the share of manufacturing value added in GDP fell from 13 to 11 percent since 2000 (Figure 7); and the share of manufactured exports also declined from 43 percent in 2000 to 39 percent in 2008.

This disappointing performance of Africa's industrial sector significantly limits the scope of agricultural transformation and regional trade which rely on a buoyant manufacturing and agribusiness sectors to strive.

Second, limited access to credit, market information, and output markets undermines the emergence of a strong African agricultural sector. Lack of access to affordable credit by small-scale producers prevents them from acquiring basic inputs, investing in technology and innovation, and thereby improving their productivity. This is also compounded by the lack of secure land tenure, which prevents land to be used as collateral. Only about 10 percent of rural land is registered in SSA; the rest is undocumented and/or informally administered, thus vulnerable to land grabbing and illegal expropriation. Moreover, it takes twice as long and costs twice as much to transfer land in SSA as in OECD countries.

On the other hand, insufficient access to market information, particularly in remote rural areas, undermines farmers' ability to take well-informed and timely decisions and negotiate better deals for their agricultural products. Moreover, evidence has shown that credit markets are not gender or youth neutral. Many financial service providers often remain reluctant to provide services (credit, savings, and insurance) to rural youth due to lack of collateral, credit experience, and financial literacy, among other reasons. In 2014, only 20.5 percent of young African adults (aged 15-24) held an account at a formal financial institution– including banks, credit unions, microfinance institutions and post banks– compared to 33.1 percent of older adults (aged 25 and above) (World Bank, 2016). Other estimates also show that the gender gap in accessing credit still exists in many SSA countries: in Uganda, for example, only 1 percent of available credit in rural areas is received by women entrepreneurs, while in Nigeria and Kenya around 14 percent of males obtain formal credit compared to around 5 percent of females (FAO, 2011). The constraining factors noted here limit youth and women's ability to engage in profitable activities, acquire modern agricultural inputs and tools, and improve both their productivity and earnings (Mukasa and Salami, 2015). Promoting financial products catered to the youth and women may thus help remedy their chronic credit constraints.

Figure 7 Value added, manufacturing sector (% of GDP)



Source: The World Bank, http://data.worldbank.org/

Third, poor planning and lack of coordination, coupled with low investment have undermined the process of agricultural transformation in Africa. Indeed, one of the main reasons for the disappointingly low rate of agricultural mechanization in Africa is the fragmented approach to mechanization adopted by African governments. In most cases, no serious and forward-looking planning for sustainable mechanization has taken place and where agricultural mechanization strategies have been formulated, they have only remained on the shelves and never come to fruition. This is also compounded by the lack of coordination within and between government agencies and their recurrent competition with private-sector initiatives. Consequently, the mechanization gap keeps widening on the continent: current statistics indicate that there are about 470,000 tractors in Africa, while 3.5 million are needed to put Africa on par with other regions of the world. Worse, the use of tractors in sub-Saharan Africa has actually declined over the past 40 years, while during the same period, the number of tractors used in Asia and Pacific region almost doubled, from 7.8 to 14.9 per 1,000 ha of arable land (Houmy et al., 2013).

Furthermore, African agriculture suffers from chronic lack of investment in agricultural infrastructure. Most agricultural systems in Africa are still based on subsistence farming, unable to generate sufficient surplus cash to purchase modern tools and machinery. The lack of investments in production-enhancing technologies has also led to a weak, often non-existent agricultural machinery industry in most African countries. Though few farm tool and machinery factories have been established in SSA, essentially in Southern Africa, efforts in other parts of the continent have not survived competition from cheap imports of tools from countries such as China and India. The economic cost of such a poorly developed agricultural machinery industry is sizeable: it is estimated that this market is worth US$ 1.5 billion per annum, but less than 10 percent is supplied by African producers. Further, there are less than 100 agricultural machinery companies in Africa, employing less than 1 percent of the total industrial labor force (Ashburner and Kienzie, 2011).

Fourth, despite their potential contributions to economic development, youth are mostly unemployed in sub-Saharan Africa at a rate higher than adult unemployment. Ten million youth enter the labor market annually, but youth in SSA are twice as likely to be unemployed as adults (Brooks et al., 2014). In 2012, the youth unemployment rate in SSA was 11.8 percent and is projected to remain unchanged in the coming years. Furthermore, it is estimated that around 20 percent of SSA's working youths earn US$ 1.25/day or less. This "working poverty rate" jumped at 64% in 2013 at US$ 2.00/day, suggesting that SSA's youth unemployment problem is both qualitative and quantitative. Despite the unprecedented economic growth on the continent between 2000 and 2013, with an average GDP growth of 4.7-5.8 percent, this growth has not been "pro-youth" enough (AGRA, 2015). Referred to as a "jobless growth", African growth has occurred in sectors that generate less job opportunities for Africa's youth, leading to both a youth jobs crisis and an increasing supply of young labourers in quest of work.

Fifth, Africa's landscape has long been defined by a lack of institutional capabilities, endemic inefficiencies, and chronic corruption, compounded by bad economic and political governance. The degree to which countries provide an enabling environment differs significantly across regions, but is strongly linked to their overall institutional development and capabilities. In that regard, African institutions fall short of expectations and one of the most important Achilles heels of the continent has always been its lack of good governance and accountability, which impedes progress and often leads to suboptimal use of natural and financial resources. The quality of institutions has improved in most African countries but not sufficiently enough to put African institutions on a sustainable pathway. Some countries, such as Rwanda, Capo Verde, Kenya, and Senegal, have performed well in terms of quality of their policies and institutions, while others (such as Sudan, Eritrea, and South Sudan) have performed weakly. The 2016 Country Policy and Institutional Assessment (CPIA) Africa report indicates indeed that the pace of improvement in Africa's governance has slowed in 2015, underpinned by lack of transparency and accountability and high corruption rates, particularly in the public sector.

Sixth, unsustainable agricultural practices are still widespread across Africa. In some areas, an inappropriate application of inorganic fertilizer, pesticides, and other agrochemicals has caused ecological damage, soil degradation, unsustainable use of resources, outbreak of pests and diseases, etc., causing considerable health problems for both livestock and humans. Such practices have resulted in degraded natural resources (farmlands and rangelands) and declining yields that impede agricultural productivity growth. In the long run, they are likely to deplete the soil of nutrients necessary to increase productivity and ensure food security. It is projected that investment of about US$ 20 to 30 billion per annum is needed over the next 10 to 20 years to reduce the continent's climate vulnerability and cap the potential negative economic impact equivalent to approximately 1.8 percent of Africa's GDP. In most African countries, the budget share allocated to climate change adaptation and mitigation strategies is still pathetically low, while it is estimated that US$ 16 billion per year are needed to support the continent to adapt to climate change.

Finally, lack of farmer's skills represents yet another bottleneck for Africa's agricultural transformation. A typical African farmer is a subsistence farmer with little (essentially, primary) or no education, generally mismatched with his agricultural activities. In many SSA countries, agricultural education is poorly developed, and there is little inclusion of meaningful agricultural knowledge in a curriculum which lacks a focus on markets and soft skills alongside of know-how. Though many African governments have increased the provision of advisory and extension services, access to new technological knowledge remains relatively low on the continent. The low literacy rates in the agricultural sector have undermined the adoption of modern technologies, including agricultural mechanization. Sometimes, the lack of farmers' knowledge about suitable equipment and the lack of operating skills have led to a misuse and mismanagement of sophisticated machines.

5 | Conclusion and policy recommendations

Increasing agricultural productivity is an imperative for a strong and competitive African agricultural sector and a successful transition from substance-oriented agriculture to agribusiness. Indeed, it is difficult to conceive of any improvement in the agricultural sector without substantial increases in farm productivity. First, this implies radical changes in farmers' agricultural practices which are still unsuitable for commercially oriented agribusiness. To achieve these changes, transition from subsistence farming to large-scale, industrial agriculture will require adequate financial instruments adapted to the specificities of the agricultural sector. Innovative agricultural value chain finance for product financing (like trader credit or input supplier credit), warehouse receipts, or risk mitigation products (such as crop or weather insurance and forward contracting) will be needed. Easier communication systems such as mobile phones and mobile banking (for instance M-Pesa in Kenya) should be popularized across the continent.

Technology innovation is also of utmost importance for a competitive African agricultural value chain. Uptake of modern technologies at each stage of the value chain will help intervening actors improve their productivity, reduce their transaction costs, facilitate their sales transactions, and access to price information, while enhancing their bargaining power.

Increasing the levels of public and private investments in agricultural mechanization is also a prerequisite for the transformation of Africa's agricultural sector. In fact, African governments need to prioritize investments in mechanization related to agro-industries by significantly increasing the share of public budgets for agricultural mechanization. This will require the diversification of the sources of government earnings so as not to crowd out other important public spending, such as education, health, transportation, or access to water and electricity. In addition, this will imply not only increases in the number of agricultural tractors, but also improvements in tools and equipment used by farmers, from clearing and cultivating the land to planting, harvesting, and also transport, storage, and processing.

Financing for climate-smart agriculture needs to be scaled up considerably to ensure a sustainable African agricultural transformation and green growth. The Malabo Declaration of 2014 wherein African leaders endorsed the inclusion of Climate Smart Agriculture (CSA) in the NEPAD programme on agriculture and climate change suggests that African governments are increasingly concerned by climate change issues and their adverse impacts on agriculture. In particular, they committed to ensuring that, by 2025, at least 30 percent of farm households are resilient to climate variability and other related shocks. Further, financing commitments on climate change from the international community and other development partners have to be met to realize CSA targets.

Moreover, there is ample evidence that ensuring a successful transformation of Africa's agricultural sector is intrinsically linked to improving its governance and the quality and accountability of its institutions. African governments need to put in place transparent and accountable systems of governance of their agricultural sector. Strong political will from African leaders will also be required, as well as involvement of citizens, civil society organizations and private sector.

Programmes aiming at supporting agricultural education for young people and women should further be promoted, as they are crucial for the development of their skills. To reduce the educational gap between men and women engaged in the agricultural sector and tackle the growing mismatch of youth skills and current labor markets' needs, there is an urgent need to equip these marginalized groups with the right agricultural skills for the job market. Initiatives that are being undertaken across the continent need to be scaled up and supported. The Ouagadougou Declaration and Plan of Action on Employment Promotion and Poverty Alleviation, the African Youth Charter, the Continental Strategy, the Malabo Declaration and Decision of Youth Empowerment, the Social Protection Plan for the Informal Economy and Rural Workers, and Agenda 2063 are among those initiatives.

Improving intra-African trade will require concerted efforts and strong political will from African governments, moving from political discourses to concrete actions. In that regard, policies to boost intra-African trade to ensure a successful transformation of African agriculture should urgently address supply constraints and improve farmers' productive capacities by taking advantage of Africa's enormous endowments in natural and mineral resources and its buoyant private sector. They should also reduce Africa's infrastructural gaps and improve countries' trade logistics while facilitating intra-regional trade by eliminating trade barriers. This involves making visa restrictions more flexible, reducing the scope of protectionist measures, and improving free movements of people across countries' borders.

Fortunately, achieving a successful transformation of Africa's agricultural value chains is not confined to only East Asian countries (such as South Korea or Japan), India, or Brazil. Significant improvements in input markets, expansion of innovative agricultural finance, and crucial land policy reforms have helped some African countries successfully improve key agricultural value chains. Examples of these country-specific success stories include Nigerian farmer registration and input distribution, floriculture growth in Ethiopia, horticulture development in Kenya, improved rice yields in Senegal and Mali, rapid and material malnutrition reduction in Rwanda, vertical integration and agro-processing in Morocco, and cotton production in Burkina Faso. These experiences mean that with appropriate incentives, political commitments, public and private investments, other African countries could also transform most, if not all, of their agricultural value chains into a more productive, competitive, and business-oriented sector.

As a development bank aimed at fighting poverty on the continent, the African Development Bank has put the transformation of Africa's agricultural sector at the center of its action, with the overarching objective of moving Africa to the

top of export-oriented global value chains where the continent possesses a comparative advantage. Indeed, between 2006 and 2014, the AfDB approved and financed 198 operations in agriculture and agribusiness, amounting to US$ 6.2 billion, making it the premier source of agricultural finance on the continent. Furthermore, the AfDB has recently elaborated its "Feed Africa: Strategy for Agricultural Transformation in Africa 2016-2025" to help transform African agriculture into a competitive and inclusive agribusiness sector that creates wealth, improves lives of Africans and secures the environment. Through this Strategy, the Bank intends to help mobilise USD 315-400 billion in investments required between 2016 and 2025 to transform key commodity value chains in which the continent has a comparative advantage. It therefore envisages to increase its agricultural investments to USD 2.4 billion per year from 2016 onwards, against its current USD 0.6 billion per year.

The transformation of African agriculture is critical to averting foreseeable food challenges on the continent. Africa's rapid population growth, coupled with a changing global food landscape means that African agriculture must grow to feed the rising population, reduce its external food dependency, and ensure food security for its population. To achieve such ambitious objectives, the agricultural sector needs to be radically transformed. Agricultural value chains must be modernized, agribusiness promoted, agricultural mechanization widespread among farmers, land and credit constrains removed, agricultural infrastructure gap closed, youth and women empowered, climate-smart agriculture supported, strong and efficient institutions encouraged, and intra-African trade boosted. It is only under such circumstances that the transformation of African agriculture will be successful and will become a driving force for economic growth and inclusion on the continent.

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