



## **BRUSSELS RURAL DEVELOPMENT BRIEFINGS**

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# **Realising the Promise of Agriculture for Africa's Transformation**

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## Briefing n. 36

# Realising the Promise of Agriculture for Africa's Transformation

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## 1. Context

The World Development Report (World Bank 2008) underscores the importance of growth in agriculture as a critical catalyst for economic growth and poverty reduction. The report points out that GDP growth from agriculture is shown to raise incomes of the poor 2-4 times more than GDP growth from non-agriculture. Sustainable agriculture plays a key role in tackling food insecurity especially in rural areas. According to the UNDP (2012b) increases in agricultural productivity and better nutrition are important for food security and human development. They argue that increased food production will increase food security by raising food availability and lowering food prices, thereby improving access to food. In addition, higher productivity will also increase peoples' incomes, which has positive effects on health and education (UNDP 2012a).

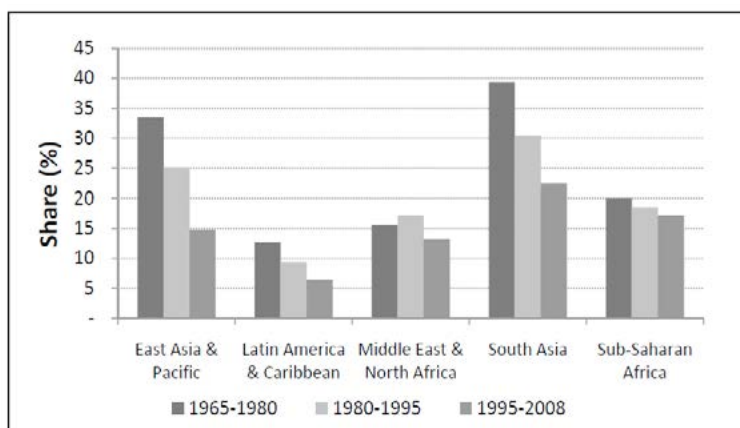
Agriculture can be a key driver of Africa's transformation because of its potential to create jobs and value-addition through increased labour and land productivity. The UN Development Programme's African

Human Development Report said that higher productivity, especially in yields of food staples and on smallholder farms, builds food security by increasing availability and lowering the price of staple foods. Improved access to affordable food is a critical input to structural transformation as it keeps the cost of living and labour costs low, and increases competitiveness and opportunities for manufacturing and industrial growth. Higher agricultural productivity also boosts rural incomes, helping agro-based industries and raising living standards. This increases demand for education and better skills. Rapid growth in agricultural productivity, anchored in rising yields of staple crops, could help African countries to reduce poverty and ensure rural and urban food security. Key inputs in raising agricultural productivity are better roads, railways, warehouses and communication technologies as well as access to markets.<sup>1</sup>

Agriculture continues to be the predominant source of employment in many regions, accounting for 63 % of rural household income

in Africa, 62 % in Asia, 50 % in Europe and 56 % in Latin America. In Africa, about 65 per cent of the total labour force is employed in the agricultural sector, which contributes about 32 percent of the continent's gross domestic product (GDP).<sup>2</sup> Historically, agricultural growth was the precursor to industrial growth in Europe and, more recently, in parts of Asia. However, agricultural growth also has much broader linkages or multipliers and allows poor countries to diversify their economies to sectors where growth may be faster and where labour productivity and wages are typically higher. Where agricultural productivity has grown slowly, as in many parts of sub-Saharan Africa, non-farm activities have also tended to grow slowly.<sup>3</sup> Agricultural production in Africa has increased steadily over the last 30 years: its value has almost tripled (+160%), showing an increase that clearly exceeds the growth rate for global agricultural production over the same period (+100%), almost identical to that of South America (+174%), and below but comparable to growth in Asia (+212%).<sup>4</sup>

**Figure 1: Average share of agriculture in GDP**



Source: WDI, 2009

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Sustaining agriculture means sustaining the incomes of those directly farming or working in secondary activities connected to agriculture. As argued by FAO, the impact of agricultural growth on poverty reduction is two times bigger than in other sectors 'Provided income inequality is not excessive, agricultural growth reduces poverty among the poorest of the poor. In resource-poor low-income countries (excluding sub-Saharan Africa), a given rate of GDP growth due to agricultural growth reduces poverty five times more than does an identical dose of GDP growth due to non-agricultural growth. In sub-Saharan Africa, agricultural growth is eleven times more effective. Therefore, raising agricultural production and productivity remains crucial for reducing poverty in a cost effective manner, especially in low-income countries'<sup>5</sup>.

Whilst in Asia food production almost doubled and South America experienced a growth of 70%, African agriculture showed modest performances if compared with the growth of its population in the last years.<sup>6</sup> Notwithstanding, a great variation exists among countries. Overall, 13 African countries doubled their production in the last 20 years, among them Burkina Faso, Niger, Mali and Ghana where small scale farmers represent a great proportion of the population.<sup>7</sup>

Africa remains a marginal player in world trade, accounting for only 2.8 per cent of world exports (in current United States dollars) and 2.5 per cent of world imports in the decade from 2000 to 2010. The shares of

both Africa and sub-Saharan Africa in world exports and imports have fallen significantly over the period from 1970 to 2011.<sup>8</sup>

### - **Many challenges for African agriculture**

Agricultural production in Africa has increased only slowly over the last forty years. African agriculture is challenged by a number of threats, such as food price spikes, inadequate exploitation of land and water, rising energy and fertilizer prices and the impact of climate change on agriculture production and livelihoods. Increases in crop yields per hectare have been much slower in Africa than in any other region of the world. To some extent this may reflect low and falling soil fertility in some areas, but lack of technical innovation is commonly seen as a major factor. Africa has not experienced the same success from the Asian green revolution's innovations and dissemination of improved varieties. Less has been spent on agricultural research and development in Africa than anywhere else (World Bank 2007, Binswanger et al. 2009). Slow progress in the use of irrigation — less than 4% of crop land is irrigated (Binswanger et al. 2009), despite its high unexploited potential (World Bank 2007) — is another element hindering increases in crop yields. Addressing climate change will require important adaptation and mitigation efforts.

Northern subsidies tend to boost world production and press down international prices, lowering returns to African exporters — cotton is a prime case where exported US

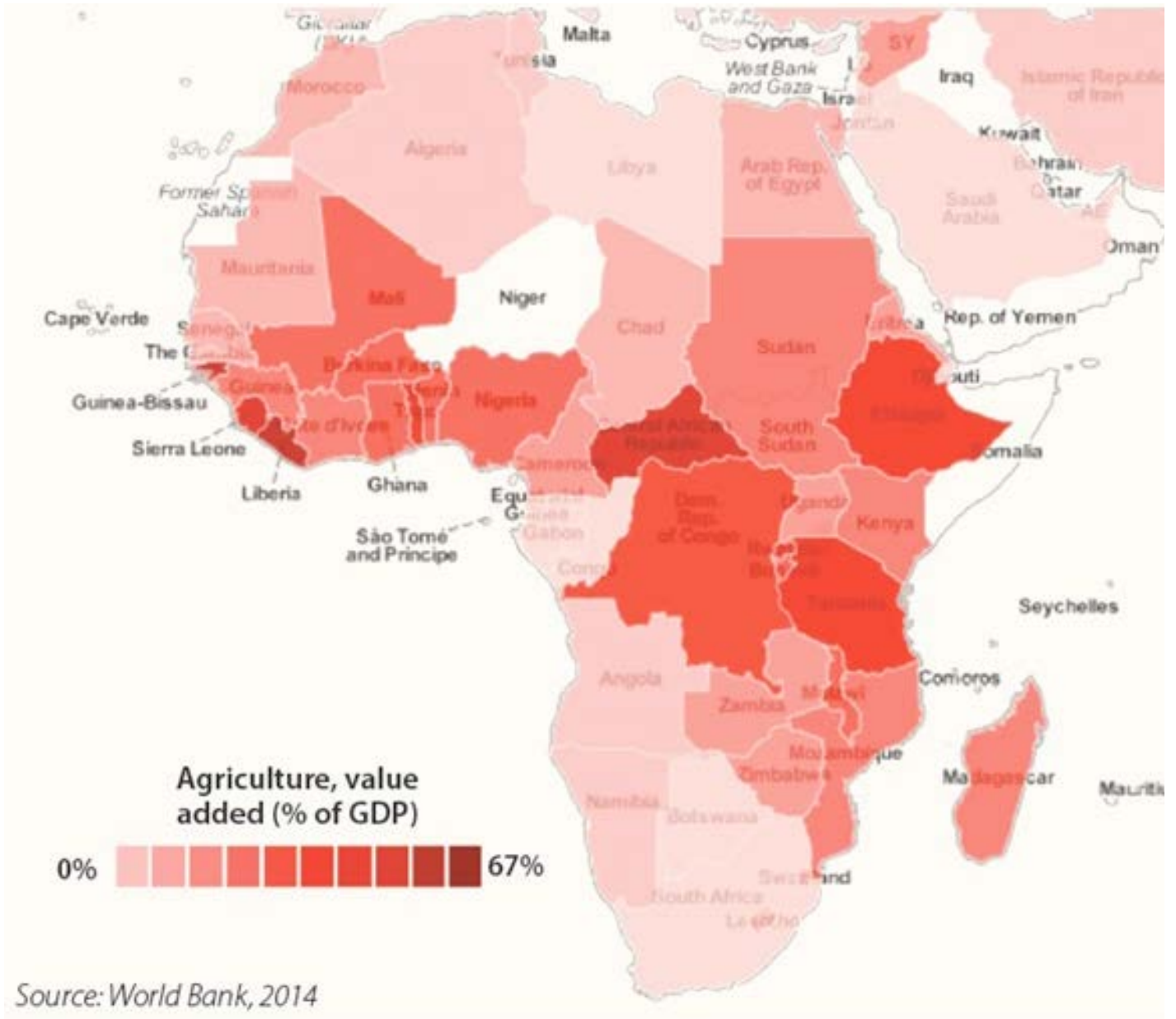
cotton produced with a subsidy lowers the world price — and making local markets vulnerable to cheaper imported food. Northern countries are sometimes accused of dumping their excess food on African markets, partly through subsidized commercial exports, and partly through food aid. Non-tariff barriers, typically in the form of stringent sanitary and phytosanitary standards, can be daunting, while 'tariff escalation', by which processed farm goods attract higher import duties than unprocessed goods, discourages value addition in exporting countries.<sup>9</sup>

Feeding more than 9 billion people by 2050 will require doubling food production on a sustainable basis. Therefore, agriculture should be resilient - able to withstand or recover from stresses and shocks. Developing resilient agriculture will require technologies and practices that build on agro-ecological knowledge and enable smallholder farmers to counter environmental degradation and climate change in ways that maintain sustainable agricultural growth.<sup>10</sup> Financial markets and rural finance institutions are weak. Progress in science and technology is inadequate and agricultural research, agricultural extension, and agriculture education remain persistently underfunded.<sup>11</sup> Lack of a coherent policy framework and low institutional capacities for policy implementation also emerge as key factors for the poor performance of aid in African agriculture (e.g. World Bank IEG 2007).

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Figure 2: Agriculture's economic importance



Source: World Bank, 2014



## 2. Overview of African agriculture

In Africa, there is insufficient domestic production, and the continent spends about \$30 billion to \$50 billion a year on food imports. This deprives the continent of funds for much needed expenditures on infrastructure and social and economic amenities. It is estimated that if continental food supplies do not increase, Africa will spend about \$150 billion on food imports by 2030.<sup>12</sup>

Agriculture remains the major sector in African economies. Even if accounting for only about one-fifth of African GDP, a great number of Africans make their living from the primary sector. Agriculture in Africa is characterized by a high degree of diversity where big exploitation co-exist with a large share of small scale producers. According to *Future Agriculture*, African agriculture is made up of almost 33 million smallholder farmers, who each may hold 2 ha or less of land and who together account for 90% of total agricultural production (Wiggins and Leturque, 2010).

Yet, governments still do not give sufficient priority to agriculture: budget allocations to the sector are very low, in spite of the 2003 Maputo Declaration, and far short of the 11–14 per cent of national budgets invested in agriculture that fuelled the Asian green revolutions. Government capacity remains weak and the quality of agricultural research and development institutions is generally poor, especially if they are decentralized. New technology is often inappropriate for local conditions or not made easily available to farmers. Poor and unpredictable

policies and chronic markets failures block access to markets for large-scale, intermediate and smallholder farmers alike, and deter farmers and entrepreneurs from investing and innovating. Demand at the farm gate is limited because of the high cost of getting goods to markets and inputs to farms.<sup>13</sup>

Africa suffers from chronic hunger. Following the food price spike of 2007/08, the FAO estimates that an additional 12% of Africans have been added to the numbers of undernourished people in Africa south of the Sahara, bringing the total to 265m, almost one third of the population. In the same region, more than a quarter (28%) of children under five were underweight in 2006.

Women's involvement in agricultural activities ranges from 20 to 60 per cent globally, yet it is also noted that their participation in agriculture-related activities is increasing in developing countries<sup>14</sup>. The International Assessment of Agricultural Knowledge, Science and Technology for Development (IASSTD 2008), recommends four steps for supporting women's activities in agriculture. These include supporting public services, particularly in rural areas to improve women's living and working conditions; creating or modifying policies targeted at technological development that recognise and address women's knowledge-enhancing skills and experience in food production; and assessing and reducing negative effects of farming practices and technologies that pose risks to women's health.

### 2.1. A variety of farming systems

Agriculture in Africa is characterized by different farming systems and different models of exploitation. Dixon et al., (2001) defined 11 farming systems based on: the access to natural resources, crop cultivated livelihood strategies in connection to markets, and intensity of production activities.

- Irrigated farming system comprises large irrigations schemes coupled with rainfed agriculture or animal husbandry. Land-holdings can go from 22 to less than 0.1 ha, the main cultivated crops are rice, cotton, vegetables, rainfed crops. The incidence of poverty connected is lower than in other farming systems.
- Tree crop farming system is characteristic of the humid zones of West and Central Africa. Main crop cultivated are commercial tree crops such as cocoa, coffee, oil palm and rubber. Intercropping is practiced for subsistence purposes. This farming systems are characterized by the presence of plantation, especially for rubber and palm oil. Poverty is limited to moderate and is concentrated among very small farmers and workers.
- Cereal-root mixed crop farming system is extend through the dry region of West Africa and parts of central and southern Africa. According to the estimation, the cultivated area would amount to 31 million

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ha, with partly (0.4 m ha) being irrigated. The livelihoods strategy is mainly based on the cultivation of maize, sorghum, millet, cassava, yam and legumes and on cattle rearing. Although cereals are important in this farming system roots and tubers are the main crop cultivated. Intercropping is also practiced and there exists a good level of commercialization. According to Dixon et al. this farming system has a good potential of becoming competitive in the production of cereals and export crops.

- Maize mixed farming system is an important source of food for Central and Southern Africa. This farming system is particularly

prevalent in plateaus and highlands at altitudes between 800 and 1500 meters. The main food crop is maize, but livelihoods strategies are also based on the cultivation of cash crops such as tobacco, coffee and cotton and on migrant remittances.

- Agro/pastoral millet/sorghum farming system is characteristic of the dry areas in Western, East and Southern Africa. Farming and livestock have the same importance. Main cultivated crops are sorghum, pearl millet and pulses. Sheep, goats and cattle rearing is also important. This farming system is characterized by high-levels of poverty and the main factor

of vulnerability for agricultural production is droughts.<sup>15</sup>

IFPRI classifies four groups of African countries based on their natural resource endowments and geographic characteristics: (1) coastal; (2) landlocked; (3) mineral-rich; and (4) less-favorable agricultural potential. These traits describe the immutable initial conditions in which agriculture and other economic activities must operate. The other two dimensions of the debate relate to agriculture's situation in the broader economy and its relationship to poverty reduction. One of the arguments in favor of agriculture playing a central role in development is its strong linkages to poor rural households.<sup>16</sup>

**Figure 3: Typology of African countries**

Rural poor more than half of poor population			
	Agriculture more than 30 percent of total GDP	Agriculture less than 30 percent of total GDP	Rural poor less than half of poor population
More-favorable agroecological conditions			
Coastal	Benin Ghana Tanzania Togo	Côte d'Ivoire Kenya Mauritius Mozambique	South Africa The Gambia
Landlocked	Burkina Faso Ethiopia Malawi Mali	Senegal Lesotho Swaziland Uganda Zimbabwe	
Mineral	Central African Republic Democratic Republic of the Congo <b>Nigeria</b> Sudan	Chad <i>Equatorial Guinea</i> Guinea Zambia	Angola Cameroon Republic of Congo
Less-favorable agroecological conditions			
	Burundi Niger Rwanda Namibia	Eritrea Madagascar Mauritania	Botswana Cape Verde

Sources: GDP and poverty data from World Bank (2010a, 2010b). Agroecological and geographic classifications from Diao et al. (2007).

Notes: Poverty shares use most recent available survey year and national poverty lines (not US\$1 per day). Only countries not rich in minerals were classified as landlocked or coastal. GDP = gross domestic product. Boldface denotes case-study countries. Italics denote middle-income status. Agriculture's share of GDP is for 2005 or closest year.

Source: Diao Xinshen, James Thurlow, Samuel Benin, and Shenggen Fan. 2012. Strategies and priorities for African agriculture : economy wide perspectives from country studies. IFPRI





## 2.2 Key trends in food production

Analyzing data from 1960 to 2007, the FAO found that Africa had become a net importer of food and agricultural products. Africa imported in 2007 almost 50 million\$ worth of food to satisfy the demand of its growing urban population.<sup>17</sup> According to the FAO, 'overall between 1980 and 2007, Africa total net food imports in real term grew at 3,4 percent per year mostly fuelled by urban population growth (2,6% per year), the increase in per capita food consumption was only about 0,8%'. Among the causes of this, the FAO found out that population growth, low and stagnating productivity in food and agricultural production and policy distortions, poor infrastructure and weak institutional support are among the main factors influencing food deficit in Africa. Imports are mainly cereals, and to a minor extend livestock products, sugar and vegetable oils.<sup>18</sup> From the export side, agricultural export are no longer the main source of foreign currency for many countries. Africa experienced a fall in agricultural exports from 42% in the 60s to under 10% between 2001-2007. Most exported foods continue to be coffee, tea and spices.<sup>19</sup>

Medium to long-term forecasts predict strong world food demand. Although increased demand can create tensions on food markets as was the case with the 2007/2008 food crisis, expanding world markets can create a good opportunity for African agriculture:

First, there are increasing market opportunities in Asia. Economic

development and diet diversification have boosted demand for products which Africa may be in a good position to supply. Opportunities also include the likely strong demand for farm produce from growing and more urban populations within the continent and from Asia.

The second key opportunity is linked to biofuels expansion. It will be very difficult for OECD countries (those in the EU in particular) to reach their biofuels targets without significant imports. African countries with underused land, such as Mozambique and Zambia, could well benefit from these expanding markets.

In addition to firm demand on traditional export markets, "high added value" exports (such as floriculture or fair trade products, etc.) are rapidly expanding, and the CMAOC expects the value of these new exports to match traditional exports value by 2030.<sup>20</sup>

For Africa's own markets, population growth, urbanisation and economic growth should result in a significant growth of demand and also provide an opportunity for farmers (Binswanger 2009). Meanwhile, demand for exports in commodities and high value products should rise from US\$8bn and US\$3bn respectively in 2000, to around US\$20bn in 2030. Furthermore, it is expected that demand on domestic and regional agriculture markets will jump from US\$50bn to US\$150bn over the same period.

Over the last forty years, food production per person in Africa has increased slowly while food production per person almost tripled in East

Asia, almost doubled in Asia overall, and in South America, it rose by 70%,.

Overall African food production per head has risen by some 18% since the early 1980s. What is more striking is the difference between regions: on the one hand, Northern and Western Africa have seen increases of 52% and 46% respectively, and on the other hand, the rest of Africa has seen food production per capita fall over this period. Indeed, Northern and Western Africa have not only raised production well ahead of population growth, but have also matched the record of Asia in raising food production per capita in this period. Concern over food production is not an Africa-wide problem but is rather concentrated in Eastern, Middle, and Southern Africa.

Between 2000 and 2005, agricultural productivity rose by 50 percent. Agricultural production increased to 12.3 percent of GDP in 2009. Unfortunately, the continuous agricultural growth that Africa has experienced has largely emanated from area expansion rather than from increases in productivity, although there has been development of rich and diverse innovations from farmers and farmers' groups.

Despite the progress in agricultural growth and the consequent improvement in food security, much remains to be done in sub-Saharan Africa.<sup>21</sup>

Food production in Africa is dominated by tubers and roots. In 2011 cassava accounted for 145 million metric tonnes of commodities produced in Africa, followed by indigenous cattle meat and yam in value terms.<sup>22</sup>

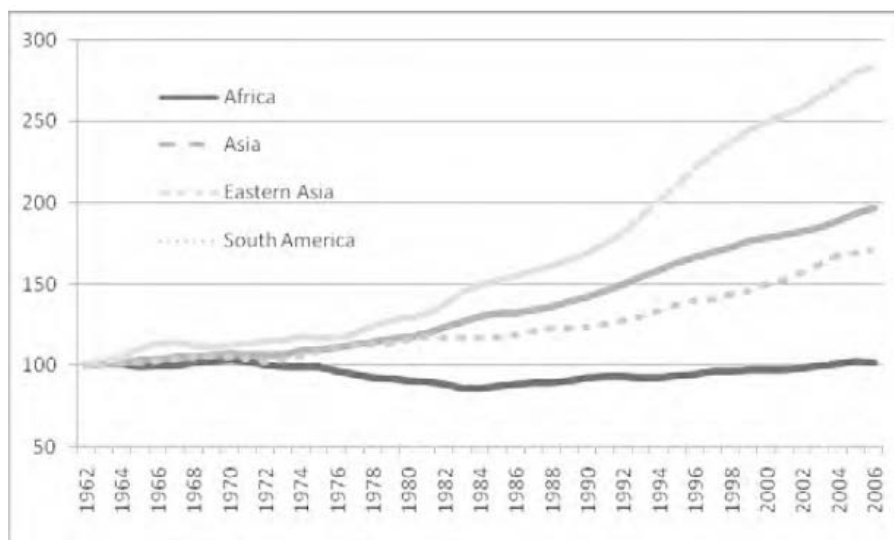
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Western Africa maintains the lead in cocoa production. In 2012, Ghana and Cote d'Ivoire together produced almost 60% of the world's cocoa beans. The region also performed

well in 2012 also in the production of cereals, with an increase of 14.2% and this had a positive impact on the general situation of food security in the region.<sup>23</sup> Notwithstanding, the

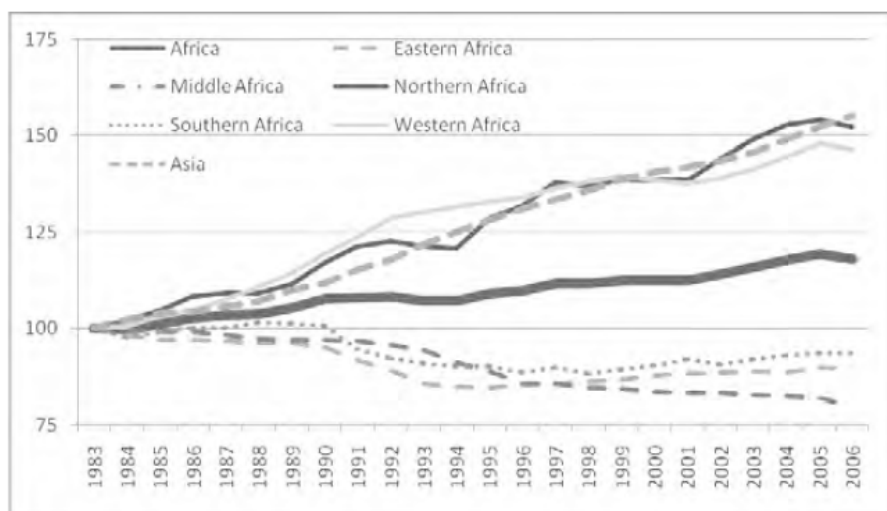
Sahel food crises in 2011/12 had a negative outcome on households assets and savings and level of indebtedness of a great part of the population.<sup>24</sup>

**Figure 4: Food production per capita, 1962 to 2006 (compared to other regions in the world)**



Source: Data from FAOSTAT, FAO. Gross food production per capita, indices, taken as three-year moving averages and based to 1961/63.

**Figure 5: Africa, food production per capita, 1982/84 to 2005/07**



Source: Data from FAOSTAT, FAO. Gross food production per capita, indices, taken as three-year averages and based to 1982/84.

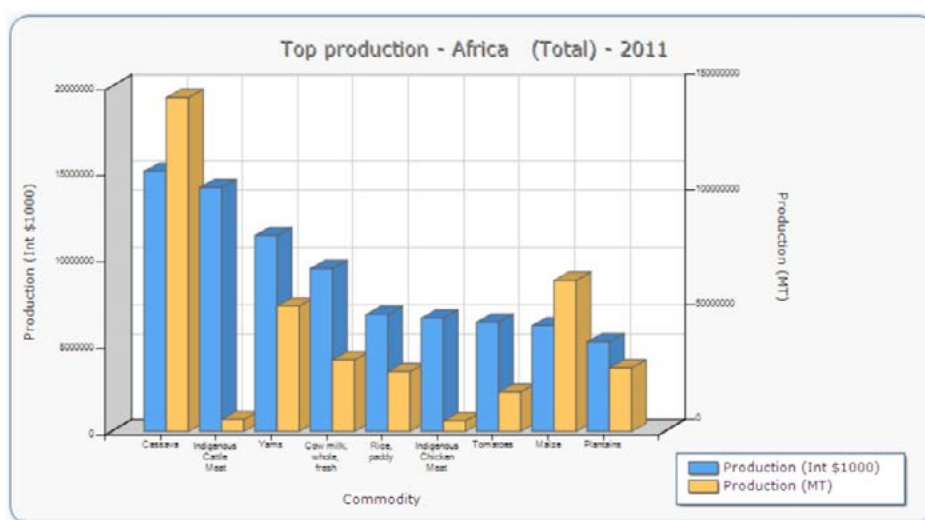


If Cameroon is excluded, Central African countries<sup>25</sup> are characterized by great dependence on imported food to satisfy local consumption.

The situation is particularly severe in CAR, DRC, Chad and Congo due to, inter alia, the armed conflicts in CAR and in Kivu region of DRC, and

population displacement. Cereals production is stagnant in the region with the only exception of Chad that doubled its production last year.<sup>26</sup>

Figure 6



Source: FAOSTAT 2011. FAO

## 2.3. Regional Trade: the new driver

Africa is spending US\$30 billion to \$50 billion annually on imports of agricultural products, and in doing so losing huge opportunities, not just in foreign exchange but most importantly in terms of lost jobs. Even half of that figure could transform Africa's agriculture if it were spent on its own products. Africa trades more with the rest of the world than within the continent itself. Available figures indicate that intra-Africa trade is about 7 percent to 10 percent, compared with about 40 percent within Europe and about 60 percent with North America. A number of barriers exists that hamper progress in expanding intra-African trade. Foremost among them

is the deficient state of infrastructure in Africa. Road density in Africa is 2.5 times less than in Latin America and 6.0 times less than in Asia. Only about one-third of Africans living in rural areas are within two kilometres of an all-season road, compared with two-thirds of the population in other developing regions. Obviously, high transport costs are arguably the most important impediment to intra-African trade. According to some estimates, an investment of US\$32 billion to upgrade the main intra-African road networks would result in trade expansion of about US\$250 billion over 15 years.<sup>27</sup>

Intra-African trade has enormous potential to create employment, catalyze investment and foster growth in Africa. Over the period from 2007 to 2011, the average

share of intra-African exports in total merchandise exports in the continent was 11 per cent compared with 50 per cent in developing Asia, 21 per cent in Latin America and the Caribbean and 70 per cent in Europe. Furthermore, available evidence indicates that the continent's actual level of trade is also below potential, given its level of development and factor endowments. There are several reasons for the weak regional trade performance in Africa, one of which is that the approach to regional integration on the continent has so far focused more on the elimination of trade barriers and less on the development of the productive capacities necessary for trade.

The limited role of the private sector in regional integration initiatives and efforts has also

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contributed to the weak trade performance of the continent.

### - **Scale, trends and composition of African trade**

With the exception of trade in merchandise, Africa remains a marginal player in world trade, accounting for only 2.8 per cent of world exports (in current United States dollars) and 2.5 per cent of world imports in the decade from 2000 to 2010. Africa's shares in world exports and imports has fallen significantly over the period from 1970 to 2011. This downward trend can be observed in almost all regions in Africa and almost all African regional economic communities.<sup>28</sup>

The level of intra-African trade has grown in nominal terms, rising from \$45.9 billion in 1995 to \$130.1 billion in 2011. It experienced positive growth in all years except for 1998-2001 and 2009. Such negative growth spells coincided with world recessions, indicating a potential sensitivity of intra-African trade to world economic conditions.

In developing Africa, the share of intraregional exports amounted to 10.9 per cent of world African exports in the period from 2007 to 2011, while the share of intraregional imports to world African imports was 12.7 per cent. These shares are lower than those in other developing regions, namely developing America and developing Asia.

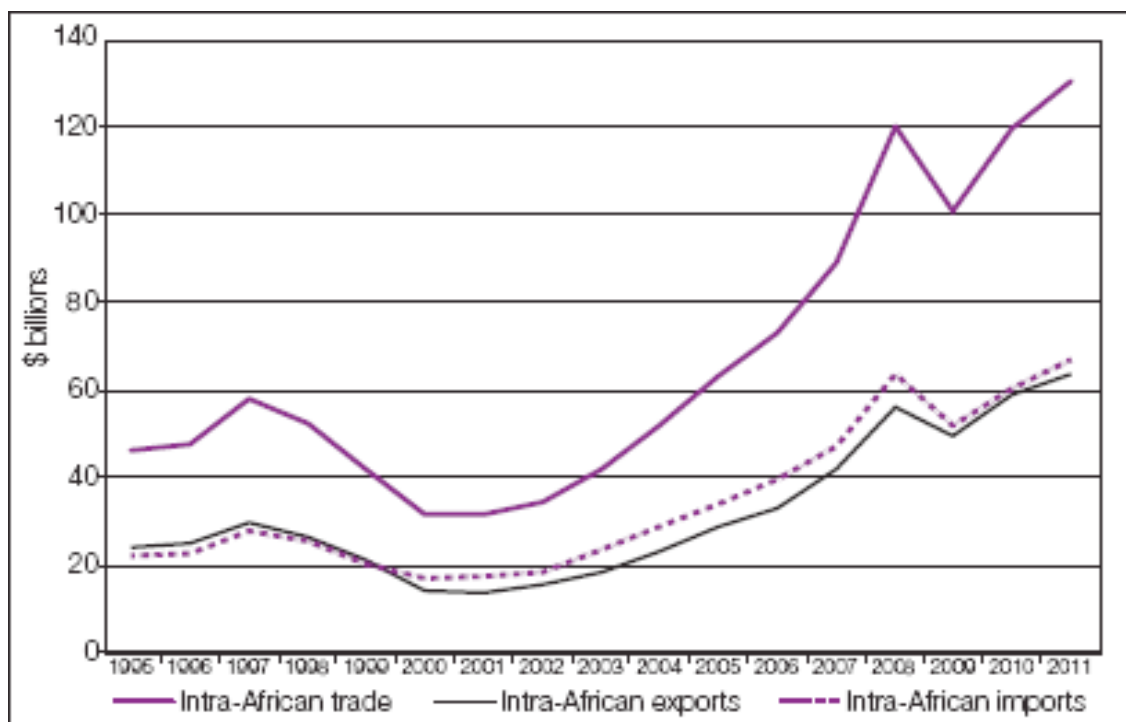
Major fuel exporters in Africa tend to be highly dependent on extra-regional markets and consequently their intra-African share in fuel trade is very low. What Africa produces and exports matters for intra-African trade. The narrowness of African production and export structures and relative dependence on primary commodities are inhibiting factors to the boosting of intraregional trade in Africa. The higher intra-trade share among non-fuel exporters in Africa supports the argument that a production base more diversified away from fuels towards non-fuel production, such as manufacturing, could provide an impetus to a deepening of regional trade in Africa.

In the discourse on regional integration in Africa, the consensus view is that intra-African trade is very low. This conclusion is based on a comparison between the share of regional trade in total African trade with that of other continents, based on official available data. This method however is problematic because it does not account for informal trade, which by most accounts is relatively large in Africa.

Ugandan informal exports to the Democratic Republic of the Congo, Kenya, Rwanda, the Sudan and the United Republic of Tanzania represented \$224 million or 83 per cent of its total recorded trade to these countries in 2006. Furthermore, estimates of informal cross-border trade in West Africa show that it could represent 20 per cent of GDP in Nigeria and 75 per cent of GDP in Benin (Afrika and Ajumbo, 2012).



Figure 7: Intra-African trade 1995-2011



Source: UNCTADstat database.

With the exception of the Economic Community of Central African States (ECCAS), for each African regional economic community, a significant part of their trade with Africa takes place within their own regional trade bloc. This confirms that the formation of regional blocs in Africa has facilitated the creation of trade among its member countries (Cernat, 2001). However, with the exception of the Common Market for Eastern and Southern Africa (COMESA), these shares have been falling compared to the period from 1996 to 2000. In fact, the level of trade of each African regional economic community with the rest of Africa more than doubled from 2001-2006

to 2007-2011. The Southern African Development Community (SADC) had the largest level of trade with Africa, averaging \$53.8 billion in the period from 2007 to 2011, followed by the Community of Sahel-Saharan States (CEN-SAD) with \$ 46.1 billion, despite the fact that CEN-SAD is the biggest trade bloc in terms of number of countries and size of GDP.

- **The importance of intra-African trade varies significantly between national economies.**

For instance, in the period from 2007 to 2011, 9 countries (Benin, Djibouti, Kenya, Mali, Rwanda, Senegal, Togo, Uganda and Zimbabwe) exported at

least 40 per cent of their goods to Africa, compared to only 5 countries in the period from 1996 to 2000. On the import side, 11 countries (Botswana, Burkina Faso, the Democratic Republic of the Congo, Lesotho, Malawi, Mali, Rwanda, Sierra Leone, Swaziland, Zambia and Zimbabwe) imported at least 40 per cent of their goods from Africa in the period from 2007 to 2011, compared to 9 countries in the period from 1996 to 2000.

Over the period from 2007 to 2011, Africa traded only 14.9 per cent of its world trade in primary commodities and 17.7 per cent of its world trade in fuels within Africa.

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This issue of unexploited opportunities in intra-African trade is particularly evident in the area of agriculture. Africa is the continent which has the greatest percentage of unused arable land; it is estimated that about 50 to 60 per cent of the world's unused arable land is in sub-Saharan Africa. However only 16.9 per cent of African world trade in food and live animals (SITC 0) and only 14.8 per cent of African agricultural imports took place within the continent in the period from 2007 to 2011, denoting that both agriculture and intra-African trade in agriculture remain significantly underdeveloped. In the period from 2007 to 2011, intra-African agricultural imports amounted on average to \$10 billion and the top ten intra-African agricultural imports, representing 46 per cent of the total, consisted of the following subproducts: sugar, molasses and honey, fish (fresh, chilled or frozen), tobacco, edible products and preparations, unmilled maize, vegetables, alcoholic beverages, tea and mate, coffee and coffee substitutes and fixed vegetable fats and oils (see figure below).

Intra-agricultural exports take place within a narrow range of only 34 products, of which some are covered by very few countries. For example, based on that analysis, only Benin and Botswana export meat to the continent. Burkina Faso, Djibouti, Ethiopia, Mali, the Niger, Rwanda and the Sudan are the only countries to count live animals among their top five exports to the rest of the region. By the same measure, rice is exported only by Benin and Cape Verde; maize only by Malawi and vegetables only by Eritrea, Ethiopia, the Niger and Somalia.

Thirty one African countries are net exporters of agricultural raw materials to the world while 37 countries are net importers of food items from the world. All countries that were net food importers from (or net food exporters to) the world were also net food importers from (or net food exporters to) Africa except for Benin, Djibouti, Egypt, Mauritania, Morocco, the Niger, Senegal and Tunisia, which had net exports to Africa but imported from the world, and Ghana, Guinea-Bissau, Madagascar and Swaziland which had net imports from Africa but exported to the world. In aggregate, however, Africa imported only 15 per cent of its food items from the rest of Africa in 2007–2011.

Given the availability of arable land in Africa and the import demand for food, there should be scope for broadening the range of agricultural goods produced and traded within Africa through appropriate agricultural and agro-industrial policies.

Countries such as Ghana and South Africa, which run large net trade surpluses on food items with the world, do not currently have agricultural products as their main five exports to Africa. This signals that there exists scope to better meet African food demand from within the region through an upscaling of domestic agricultural production in African countries.

The share of manufacturing in intra-African trade is higher than its share in African extraregional trade. However the importance of manufacturing in intra-African trade has been falling over the last decade. The share of manufactured goods

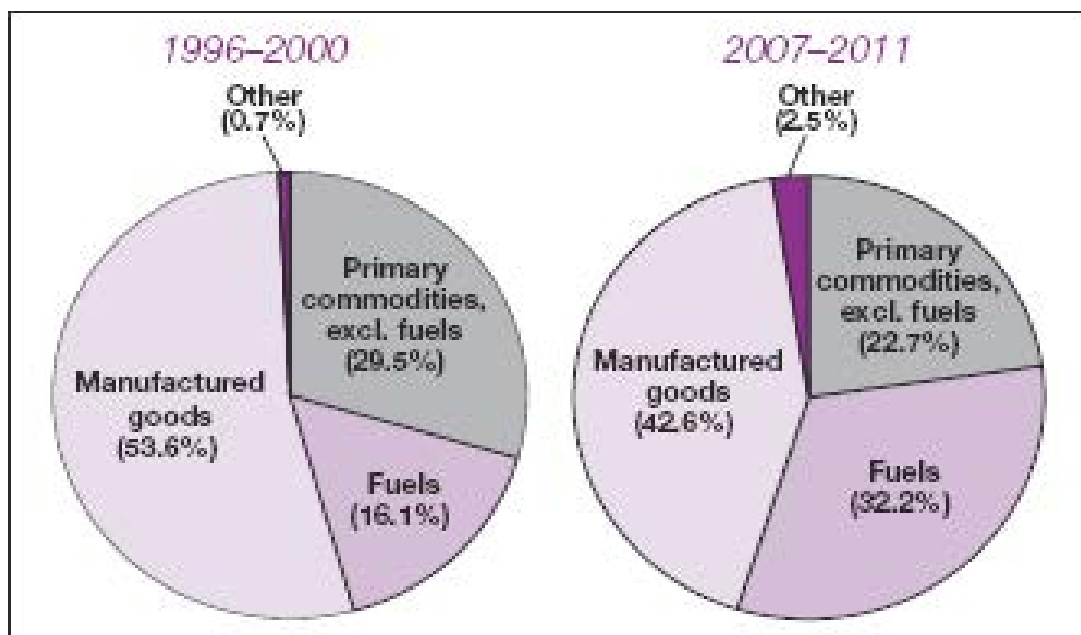
in total intra-African trade averaged 42.6 per cent in the period from 2007 to 2011, compared to 53.6 per cent in the period from 1996 to 2000.

In the period from 2007 to 2011, the share of manufacturing in trade between regional economic communities was highest in EAC (58.3 per cent), followed by SADC (51.4 per cent), COMESA (44.8 per cent), IGAD (39.1 per cent), AMU (35.2 per cent), CEN-SAD (34.3 per cent) and ECOWAS (25.7 per cent). These variations in numbers can again be associated with the differing levels of manufacturing development of the member countries of the regional blocs.

Africa is a marginal player in world trade, with low levels of intraregional trade. However, figures also demonstrate that both intra-African trade and African trade with the rest of the world has been growing vibrantly, displaying nominal growth rates that are comparable to those in other regions. The empirical analyses also show that significant regional trade opportunities remain to be exploited in multiple sectors, including primary commodities, manufacturing and agriculture. Regarding investment, the evidence suggests that there has been a significant increase in the number of new intra-African FDI projects, driven mainly by Kenya, Nigeria and South Africa. However, most of the new deals relating to intra-African greenfield investments were in the services sector. Furthermore, South Africa remains the only African country in the list of top 20 investors in Africa, as reported by investing economies.



Figure 8: Distribution of intra-African trade by main product category, 1996-2000 and 2007-2011



Source: UNCTADstat database.

## 2.4. Addressing under-performances of interregional trade in Africa

### Poor competitiveness in production and trade

Intra-African trade is hampered by the weak supply response to regional market opportunities and lack of export competitiveness. One of the biggest challenges is to help create regional trade networks in agricultural products, linking small farmers to supermarkets and exporters throughout their local region.

Firms in most African countries face high production costs due to poor access to production factors

such as electricity, credit, skilled labour and other inputs. As a result, they find it difficult to produce competitively. Africa lags behind other developing-country regions in terms of physical and social infrastructure. Road density on the continent is 7.2 kilometres per 100 square kilometres of arable land compared to 127 for non-African developing countries. Electricity production is 398 megawatts per million people compared to 2,475 for non-African developing countries. Furthermore, only 67 per cent of the population have access to water and 35 per cent have access to improved sanitation facilities. The corresponding figures for non-African developing countries are 85 and 70 per cent respectively (Beck et al., 2011). The continent also has a very low Internet penetration

rate: 3 per cent relative to the world average of 14 per cent. In addition, infrastructure services cost twice as much in Africa as in other developing-country regions.

Africa is spending US\$30 billion to \$50 billion annually on imports of agricultural products, and in doing so losing huge opportunities, not just in foreign exchange but most importantly in terms of lost jobs. Even half of that figure could transform Africa's agriculture if spent on its own products. Africa trades more with the rest of the world than within itself. Available figures indicate that intra-Africa trade is about 7 per cent to 10 percent, compared with about 40 percent within Europe and about 60 percent within North America.

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A number of barriers exists that hamper progress in expanding intra-African trade. Foremost among them is deficient state of infrastructure in Africa. Sub-Sahara Africa has the lowest density of roads in the world: 204km per 1000km<sup>2</sup> of land area, on average. The world average is 944km/1000km<sup>2</sup>. Road density in Africa is 2.5 times less than in Latin America and 6.0 times less than in Asia. Only about one-third of Africans living in rural areas are within two kilometers of an all-season road, compared with two-thirds of the population in other developing regions. Obviously, high transport costs are arguably the most important impediment to intra-African trade and transport costs and insurance take 50% of the value of exports. According to some estimates, an investment of US\$32 billion to upgrade the main intra-African road network would result in trade expansion of about US\$250 billion over 15 years.<sup>29</sup> The Trans-Africa Corridor developed by the United Nations Economic Commission for Africa (UNECA), the Africa Development Bank (AfDB) and African Union (AU), will comprise nine trans-continental

roads equalling 56,683km that link, or closely pass most continental African states. It is estimated to generate \$250 billion over 15 years in overland intra-African trade.<sup>30</sup>

### - **Product and market concentration**

The external trade of African countries is concentrated around a limited range of products. While the narrow production base in Africa restricts regional trade, it does not fully explain intraregional trade dynamics. In ECOWAS, for example, despite the existence of a narrow range of exported products, an index of the region's comparative advantage shows that exports from countries within the region differ considerably from their imports. Hence, there is potential for increasing intraregional trade, particularly in food and agricultural products where African countries have a current comparative advantage.

Regionalism increases the potential for trade, owing to economies of scale, product differentiation and intra-industry trade. Product concentration may therefore be seen as a short-term constraint to

intra- African trade. Over time, the existence of a large market can alter existing patterns by developing new products, reallocating resources towards new industries and rationalizing existing ones (UNCTAD, 2009; Keane et al., 2010). Hence, the political commitment to boosting intra-African trade will need to go hand in hand with measures to boost industrialization and intra-industry trade development.

### **External factors**

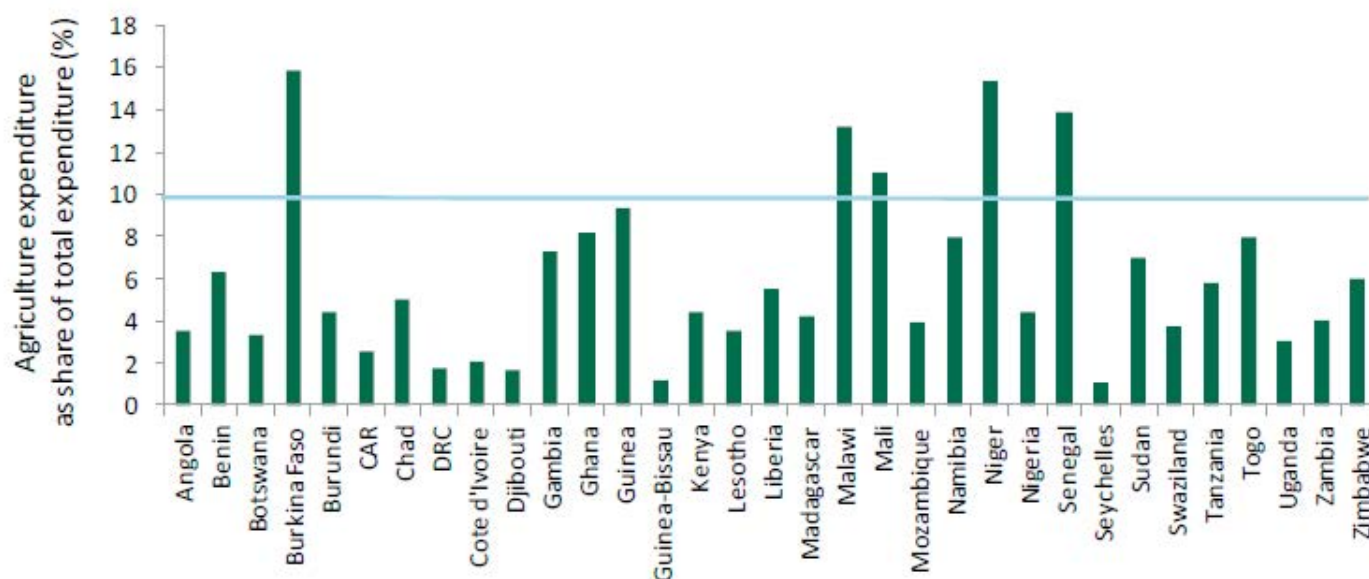
Globalization and trade liberalization in Africa have intensified competition. What used to be local and regional markets are now part of a relatively open global market. African consumers have become more exposed to imported products, including from the emerging economies in the South, that are cheaper alternatives to locally or regionally produced goods (Kaplinsky and Morris, 2008; Ighobor, 2013). This has contributed to deindustrialization, as evidenced by the fact that the share of manufacturing in African GDP fell from 15 per cent in 1990 to 10 per cent in 2008 (UNCTAD and UNIDO, 2011).





### 3. Revitalizing agriculture in Africa: the Comprehensive Africa Agriculture Development Programme (CAADP)

Figure 9: Public expenditure on agriculture as share of total budgetary expenditure, selected countries, 2007



Source: Fan, Omilola, and Lambert (2009); Fan (2011); the Regional Strategic Analysis and Knowledge Support System (RESAKSS) database of the International Food Policy Research Institute.

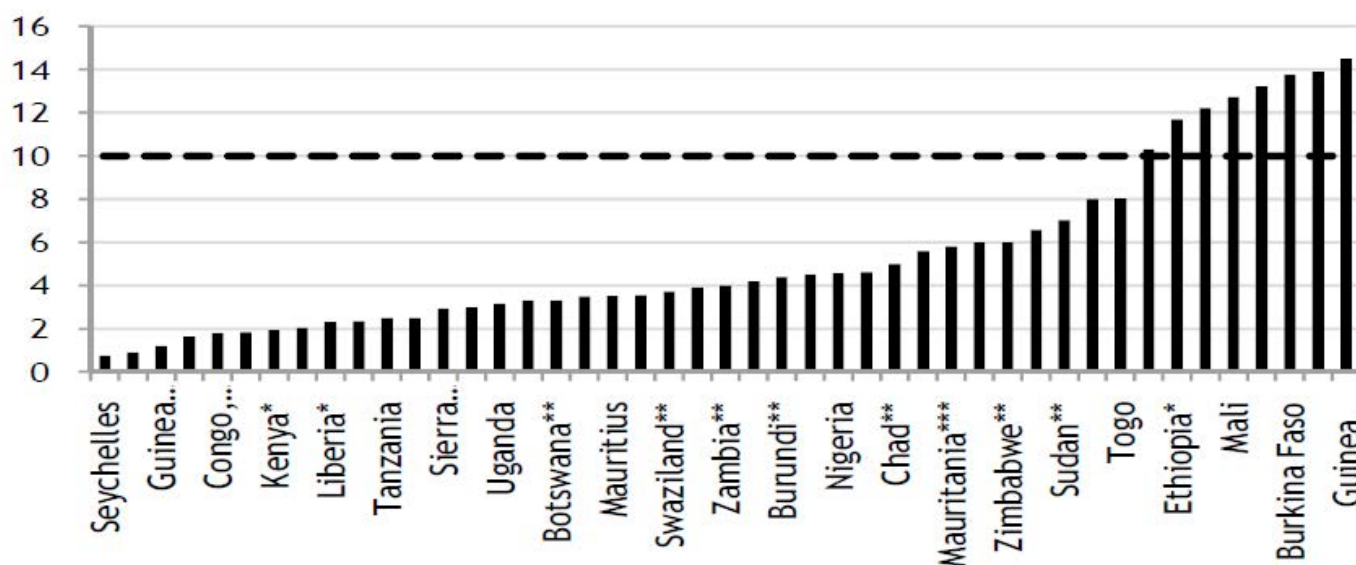
Revitalization of agriculture and increased productivity in Africa have to feature prominently in Africa's future growth agenda.<sup>31</sup> Fortunately, this viewpoint is also shared by African leaders, who in 2003 launched the Comprehensive Africa Agriculture Development Programme (CAADP).

The broad adoption and implementation of the CAADP offers the opportunity to sustain and deepen the recovery process. If, through CAADP, a large number of countries manage to maintain a 6 percent growth trajectory, living conditions on the continent would change dramatically within a generation. At the beginning of the last decade, only 5 countries exceeded the CAADP

agricultural growth target of 6 percent. By the middle of the decade, the number had grown to 9. In 2009, the average agricultural growth rate for Africa as a whole as well as for two sub-regions (North and Southern Africa) exceeded the 6 percent target (ReSAKSS 2011). It is worth noting that this level of agricultural growth is similar to that witnessed by India during much of its Green Revolution.<sup>32</sup>

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Figure 9: Agricultural expenditure shares (latest in percent)



Source: ReSAKSS 2011.

Successful implementation of CAADP can help African countries boost productivity in the agricultural sector and reverse the patterns of productivity-reducing structural change discussed above. However, this would require continued commitment to the agenda by African countries, leadership and ownership by African governments and stakeholders, and full alignment by the international development community.<sup>33</sup>

### 3.1. Launch of the CAADP

The Comprehensive Africa Agriculture Development Policy (CAADP) is an agricultural policy framework aiming at accelerating agricultural growth in Africa. It is an initiative of the African Union (AU) and of the New Economic

Partnership for Agricultural Development (NEPAD).

In early July 2003, in the first conference of Ministers of Agriculture of the AU in Maputo, Mozambique, a CAADP Plan of Action for national and regional levels was drafted and presented to the participants. In the second Ordinary Session of the Assembly of the AU in mid-July 2003 in Maputo, CAADP was approved by the HSG<sup>34</sup> and the Maputo Declaration on Agriculture and Food Security in Africa was adopted.<sup>35</sup>

In the Maputo declaration the Head of States and of Government commit themselves to implement the CAADP and to achieve, by 2015: (i) increase of agricultural output by 6% annually, at national level; (ii) allocate ten percent of national budget to agriculture.

The goal of CAADP is to “help African countries reach a higher path of economic growth through agriculture-led development, which eliminates hunger, reduces poverty and food insecurity, and enables expansion of exports.” The original focus was to promote immediate interventions that best respond to the widely recognized crisis situation of African agriculture. Thus, CAADP had been cast to deliberately focus on investment in the three pillars that were deemed to make the earliest difference to African agriculture’s dire situation: i) sustainable land use, ii) rural infrastructure and trade related capacities, and iii) food security. At the request of Africa’s Agricultural Ministers, a “Research and Technology” pillar was added and subsequently incorporated into the CAADP main document<sup>36</sup>



Since 2005, a new approach was designed which takes CAADP principles more seriously into account. Under the leadership of the RECs, country processes are suggested that follow certain steps: i) taking stock of existing policies and strategies in the country and modeling whether they are adequate to achieve the CAADP objectives, ii) developing strategies to fill any gaps identified, and iii) facilitating dialogue among various stakeholders at a roundtable conference organised to discuss policies and investment opportunities, develop partnerships, harmonise development assistance and develop a framework for review and accountability. The final outcome of a national CAADP process is a document called the Compact, which is signed during the roundtable by all groups of stakeholders (including the ministry of finance) and donors in agricultural policy and commits them to implement the Compact.<sup>37</sup>

The CAADP is centred around the definition of national and regional plans ('Compacts'), an agreement between all stakeholders (public, private as well as donors) serving as a framework for partnerships, alliances, and dialogue to design and implement the required policy interventions and investment programmes. The formulation of national and regional investment plans is one of the most important activities to implement CAADP after the definition and signature of the Compact.<sup>38</sup>

## 3.2. Main areas of intervention of CAADP

The main areas of intervention that CAADP intends to stimulate are organized in 4 pillars and two cross cutting issues.

### **Pillar 1: *Extending the area under sustainable land management and reliable water control systems.***

This pillar recognises the importance of water and its managed use in raising the productivity of agriculture and ensuring sustainable and predictable outputs. Major efforts need to be undertaken to build up fertility and the moisture holding capacity of agricultural soils and to rapidly increase the area equipped with irrigation, especially small scale water control.

### **Pillar 2: *Improving rural infrastructure and trade-related capacities for market accesses***

Africa's rural infrastructure is inadequate by any standard and its road network is particularly underdeveloped. Under this pillar, a major focus will be put on complementary investments in rural infrastructure, particularly rural roads, storage, and processing and marketing facilities that will be required to support the anticipated growth in agricultural production

### **Pillar 3: *Increasing food supply, reduce hunger, and improve responses to food emergency crises***

Hunger still remains widespread in Africa. Two approaches are thought to have the potential to make an immediate impact on farmers' livelihoods: (a) provision of safety nets; and (b) food security through agricultural production enhancement.

### **Pillar 4: *Improving agriculture research, technology dissemination, and adoption***

In Africa, as elsewhere in the world, agriculture will need a scientific and technological underpinning to maintain sustained productivity gains which are necessary to remain competitive. Several lines of action will be necessary, including: (a) increasing investments in research and technology development; (b) increasing the share of private sector funding of agricultural research; and (c) institutional and financial reforms for greater research sustainability.

### **Cross cutting issue 1: *Capacity strengthening for agriculture and agribusiness: academic and professional training***

The need for increasing capacity in agricultural science as well as agricultural and development economics in Africa arises out of the fact that Africa is experiencing a significant capacity shortage. The capacity gap must be addressed if the advances made thus far in agriculture-led poverty reduction in the continent are to

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continue and the regions currently experiencing serious declines in food security are to reverse their situation.

### ***Cross cutting issue 2: information for agricultural strategy formulation and implementation***

An important part of strategy and policy formulation and implementation is to have access

to adequate benchmarks, best practices, statistical information, and other relevant technical information. This access is lacking in most African countries. The situation can be remedied by using modern communication technologies to collect, store, and expand access to the above information. Doing so collectively at the regional level would allow

economies of scale and encourage mutual learning and exchange of experiences. It is also critical to achieve consistency of long-term development efforts in African countries and in particular to maintain the focus on poverty reduction through higher productivity and incomes among the poorer segments of the population.



### 4. Financing agriculture

In the late 1980s official development assistance for agriculture in Sub-Saharan Africa was estimated at US\$4bn; by the early 2000s it had fallen to just US\$1bn (Binswanger & McCalla 2008 using OECD data). Donors have moreover often been inconstant in their efforts, not supporting efforts long enough for them to take root. External contributing factors include the shift of more donor resources to other sectors, such as infrastructure and the social sector. Abundance in food production in the 1990s led to low food prices in the international markets and less support to agriculture in developing countries. Agriculture was also seen as a contributor to natural resource destruction and environmental pollution (World Bank 2007).

The internal factors, specific to the agricultural sector, that led to declining share of aid, included delays in completion of agricultural projects in less developed countries and the associated cost, poor road and market infrastructure, undeveloped financial sectors, and higher weather related and disease risks. Added to this is the weak governance and institutional capacity structures entrusted to design, administer, and implement projects in an efficient manner in these countries (World Bank 2010: xi). This meant that, on the one hand, donors had to spend time building these institutions, and on the other hand, resulted in delays in disbursement. Together these factors led donors to shift focus to policy reforms, both sectoral and macro, thus increasing policy-based lending as against direct lending to agriculture.<sup>39</sup>

Foreign direct investment (FDI) in Africa increased from US\$2.4 billion in 1985 to US\$53 billion in 2008. But much more is needed, especially with an agricultural focus. In a key report to the November 2011 G20, Bill Gates explored a range of options for raising significant amounts of funds from the private sector for development. The options include interest on sovereign wealth funds (SWFs), diaspora bonds and various taxes, on tobacco, bunker fuel and financial transactions. Collectively these could raise some US\$80 billion for a range of health and agriculture investments<sup>40</sup>.

#### 4.1. Financing Agricultural Research and Development

During the past 50 years, agricultural science in many developing countries has benefited greatly from support from industrialized countries. Donors have provided financial support to national agricultural research systems, supported scientific training at foreign universities, organized in-country training programs, allocated staff to assist in training and research, and helped develop an international architecture that facilitates the movement of knowledge and materials for agricultural research and development (R&D). Donor support was withdrawn in many countries due to concerns over inefficiencies and competition for funding with health, education, and other social-sector investments, and because of complacency over high global food surpluses and low commodity

prices (Christensen 1994; World Bank 2008). Recent analysis shows that public investment in agriculture and agricultural R&D in many Sub-Saharan African countries has started to move away from crisis levels. New commitments from governments and foreign donors over the past decade have put agriculture back on the agenda and attracted new resources to the task, sizable portions of which have been channeled to Sub-Saharan Africa. Unfortunately, the quality of data on levels and trends in donor funding makes it difficult to analyze these changes precisely: estimates of donor funding for agricultural R&D in Sub-Saharan Africa vary widely. The Organisation for Economic Co-operation and Development (OECD 2011) estimates commitments (not disbursements) for 2009 at just \$67.1 million (in constant 2009 prices), inclusive of bilateral and multilateral assistance. However, the OECD estimates omit commitments from private donors, such as the Bill and Melinda Gates Foundation (BMGF). A study by Morton (2010) estimates donor funding for agricultural R&D in Sub-Saharan Africa in 2009 at approximately \$450 million. Coppard (2010) places the 2008 figure at about \$245.6 million (in constant 2007 prices).

These gains were partly the result of traditional donors returning to agriculture during the first decade of the new millennium, but they were also the result of new donors entering the landscape. Renewed, expanded, and more diversified funding contributed much to this increase in public expenditure on agricultural R&D in Sub-Saharan Africa and other developing regions.

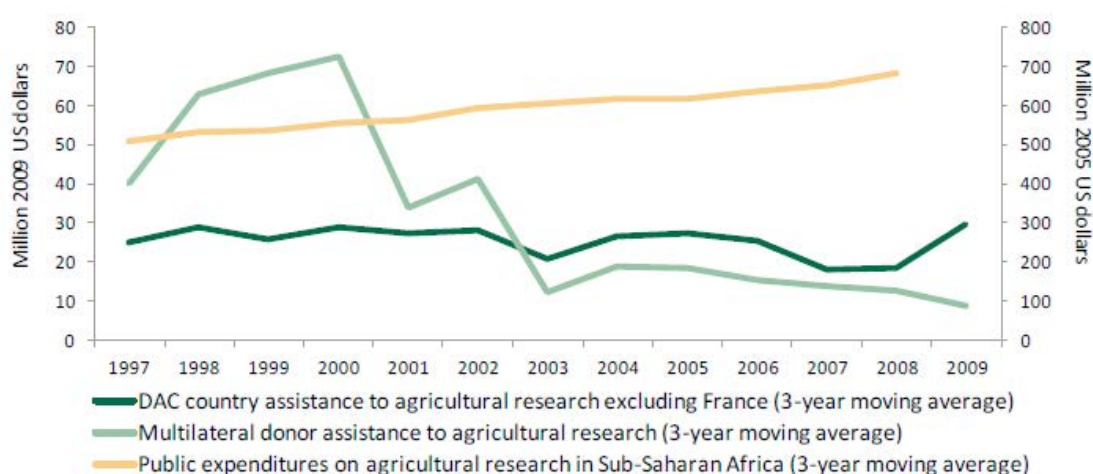
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Nonetheless, donor funding to agricultural R&D in Africa remains

tenuous at best. Funding still tends to be fairly volatile from year to year

and uncoordinated among donors at regional and national levels.<sup>41</sup>

**Figure 10: Selected donor commitments and governments spending on agricultural research in Sub-Saharan Africa 1997-2009**



Source: Spielman David J., Zaidi F. and Flaherty K., based on data from OECD (2011) and Beintema and Stads (2011)

Note: Development Assistance Committee (DAC) and multilateral assistance to agricultural research are measured on the left-hand scale; public expenditures on agricultural research are measured on the right-hand scale. DAC country assistance figures do not include France due to unexplained discrepancies in OECD data, which record official development assistance to agricultural research as climbing steadily from US\$7.3 million in 1995 to US\$63.5 in 2006, followed by a massive increase to US\$297.6 in 2007 before dropping to US\$29.9 in 2008 (all in nominal terms). OECD's multilateral donor trend does not include the African Development Bank and the International Bank for Reconstruction and Development.

The return of USAID to the agricultural development landscape in 2002-03 came with new programs, such as the 2002 Initiative to **End Hunger in Africa** and the 2004 **Linking Producers to Markets strategy** (IRG 2005). Domestic, regional, and international market and trade policy became key priorities alongside engagement with nonstate actors, such as community-based producer organizations. Science and technology remained a high priority, carrying over the commitment to agricultural research from previous eras. The Obama Administration's **Global**

**Hunger and Food Security Initiative**, launched in 2008, has attempted to heighten this support to agricultural development and agricultural research. In 2009, the **Feed the Future (FTF) initiative** committed \$3.5 billion to agricultural development and food security programs over three years, while also leveraging additional donor commitment to integrated programming around inclusive, agriculture-led growth and nutritional improvement, bridging humanitarian relief, sustainable development strategic coordination, and accountability (FTF 2011).

Other donors have demonstrated a long-term commitment to supporting the region's agricultural research systems: United Kingdom's Department for International Development (DFID), the Canadian International Development Agency (CIDA), the International Development Research Center's (IDRC), the Japan International Cooperation Agency (JICA), and Germany's Federal Ministry for Economic Cooperation and Development, among many others.

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DFID, along with the Italian government, the European Commission, and the World Bank, also supports the **Sub-Saharan Africa Challenge Program**, an initiative that began in 2004 to support R&D specifically focused on supporting smallholders across the region. Current funding levels for the program total approximately US\$5 million per year.

IDRC funds the Agriculture and Food Security program, which is designed to find good practices that link new agricultural technologies to existing farming systems in Sub-Saharan Africa and South Asia. Funding for the program was on the order of C\$25–30 million in 2010–11 (IDRC 2010). The International Finance Corporation (IFC), the private investment arm of the World Bank group, is also involved in agricultural development, although little in their lending portfolio directly suggests a focus on investing in R&D companies or programs. Still, in recognition of the potentially strong development impact of agribusiness, IFC sharply increased its activity in the sector with commitments of approximately \$100 million to the agribusiness sector in Sub-Saharan Africa in 2010–11 compared with an annual average in the previous decade of just \$18 million per annum (IFC 2010).

Between September 2003 and June 2011, the Bill and Melinda Gates Foundation awarded 269 grants totaling US\$1.822 billion for agricultural development. Of these, 152 grants totaling US\$1.142 billion were partly or entirely for agricultural development in Africa, and 80 grants totaling US\$642 million were partly or entirely directed to agricultural

R&D in the region. In a few short years, the Foundation has invested over 40 percent of its sizable portfolio on African agricultural development and agricultural R&D; its investments have changed the donor landscape dramatically.

An important investment by the Bill and Melinda Gates Foundation is the Alliance for a Green Revolution in Africa (AGRA), established in 2006 as an initiative owned and driven by African priorities. AGRA has received funding from the Foundation on the order of US\$4.2 million per year. At present, it is a large and influential funder throughout the region with strong connections to NEPAD, a leadership position among donors and development agencies working on agricultural R&D in the region, and a diversified range of investments in agricultural science, capacity building, and market development (Morton 2010).

Foundation funding to agricultural development in 2009 was US\$273 million, 43 percent of the comparable investment by the U.S. Agency for International Development (USAID) that year, and about 11 percent of the \$2.6 billion committed to agriculture by multilateral and bilateral donors. However, these figures may overestimate the relative contribution of the Foundation, as many of its grants are multiyear commitments that suggest lower levels of total funding when measured annually.

### - **South-South ODA**

A less heralded trend in donor funding for agricultural R&D has been the growth of South-South

official development assistance, notably from Brazil, China, and India to Sub-Saharan Africa. China's most significant engagement in Africa's development was set forth in 2000 by the Forum on China-Africa Cooperation (FOCAC), via the ambitious "Program for China-Africa Cooperation in Economic and Social Development" (AATF 2010; FOCAC 2009). Beyond its commitments to canceling debts, reducing trade barriers, and increasing development assistance for African countries, the program committed resources to training African agricultural scientists and establishing agricultural technology demonstration centers with the support of Chinese expertise. Between 2003 and 2008, more than 4,000 African students traveled to China for short-term (three-week to three-month) courses related to agriculture (Brautigam 2009). A significant part of China's commitment to African agricultural development is contained in a donation of US\$30 million to the Food and Agriculture Organization of the United Nations (FAO) in 2009. The aim of this donation was to expand China's contribution to FAO-led efforts to eradicate hunger and poverty by assisting developing countries to improve agriculture and food production under the umbrella of FAO's Special Program for Food Security (SPFS). China, along with other developing countries, uses SPFS as a vehicle to provide experts, technicians, and technical support to national and regional food security activities (FAO 2010). Technology transfers and spillover effects are an implicit outcome of the program design, with the potential to parallel other donor initiatives and programs, such as AGRA (Brautigam 2009).

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Brazil's engagement in Sub-Saharan Africa is also expanding. Its research linkages with the region were strengthened in 2006 with the opening of an international office for the Brazilian Agricultural Research Corporation (Embrapa) in Accra, Ghana. This office has pioneered a number of technology transfer partnerships across the region and has been followed by the Africa Brazil Agriculture Innovative Marketplace launched in 2010 during the Brazil-Africa Dialogue on Food Security, Fighting Hunger, and Rural Development. The marketplace aims to benefit smallholders by enabling Africa-Brazil research partnerships (Barka 2011).

A key change in the bilateral and multilateral donors' approach to agricultural development relates to their increased commitment to coordinating their funding. Efforts to this end include, for example, the Global Agriculture and Food Security Program (GAFSP), a financial intermediary fund for which the World Bank serves as Trustee. With an available US\$521 million (of US\$925 million pledged by most of the world's major donors), GAFSP seeks to support strategic investment plans for national and regional agriculture and food security through both public- and private-sector financing (GAFSP 2011). Agricultural extension, training, and research figure significantly in GAFSP's investment portfolio, although exact figures on their allocations are not publicly available.

A related effort to this end is the donor community's continued efforts to strengthen the

Consultative Group on International Agricultural Research (CGIAR), which received donor funding on the order of US\$606 million in 2009. Donors have worked closely with the CGIAR in recent years to initiate wide-ranging reform. The aim of this work is to strengthen the CGIAR system's capacity to provide a more systematic and coordinated approach to generating high-impact research for development.

### - **Funding to Regional and Subregional Research Organizations**<sup>42</sup>

Increasingly, donors are investing in regional and subregional agricultural R&D organizations and networks, for example, the Forum for Agricultural Research in Africa (FARA), the Association of Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the West and Central African Council for Agricultural Research and Development (CORAF/WECARD). The original intent of developing and funding these entities was largely to capture knowledge spillovers from R&D between large and small countries in an integrated and coordinated manner. In effect, these organizations were seen as a more effective and efficient way of organizing and developing research networks across the continent (Mrema 1997). Interestingly, many of these organizations have evolved from fairly basic coordinating bodies into management units charged with overseeing complex regional R&D projects. Still, estimates from FARA (2006) suggest that just 1

percent of all funding for Africa's agricultural productivity programs (including both public and private expenditures at local, national, subregional and global levels) are administered by these regional and subregional organizations.

The World Bank has taken an innovative spin on this regionalized approach to agricultural R&D. Two such investments, the East Africa Agricultural Productivity Program (EAAPP) and the West Africa Agricultural Productivity Program (WAAPP), aim to enhance capacity strengthening and technology transfers through knowledge sharing and regional specialization in agricultural research (World Bank 2007, 2009, and 2010). EAAPP involves four countries, Ethiopia, Kenya, Tanzania, and Uganda and an investment of US\$90 million over six years. The original phase involved three countries in West Africa, Ghana, Mali, and Senegal (US\$51 million), followed by a second phase focused in Burkina Faso, Côte d'Ivoire, and Nigeria (US\$119 million); a third phase was recently approved to include Benin, The Gambia, Liberia, Niger, Sierra Leone, and Togo (US\$84 million), all implemented in six year phases (World Bank 2011b).

The programs will establish commodity-specific regional "centers of excellence" charged with conducting R&D of immediate relevance not only to the host country, but also to the wider region. For some of these smaller countries, rather than centers of excellence, program activities will focus on capacity strengthening of national research agencies and technology





generation, dissemination, and adoption. Implementation of the programs is being overseen by ASARECA and CORAF for their respective subregions. A Southern African productivity program, the Centre for Agricultural Research and Development for Southern Africa (CARDESA) was established in

2011 to follow the lead of ASARECA and CORAF as a similar agricultural R&D coordinating body for the Southern Africa Development Community (Nyirenda 2011). Donors are increasingly interested in funding an expansion of private-sector involvement in developing-country agricultural R&D.

Growing donor reliance on regional and subregional organizations and networks may help countries capture knowledge spillovers from regional R&D, but the capacity limitations of these organizations and networks are important.

## 5. Private Sector role in African Agricultural Transformation

Private sector interest in African agribusiness is unprecedented. The past decade has witnessed an upsurge in interest from the private sector in African agriculture and agribusiness, including interest from foreign investors and investment funds. International investors actively seek alternative venues to Asia and Latin America as a new source of supply and an opportunity for higher, risk-adjusted returns. The challenge is to harness investors' interest in ways that generate jobs, provide opportunities for smallholders, respect the rights of local communities, and protect the environment. Going forward, a key challenge is to curb speculative land investments or acquisitions that take advantage of weak institutions in African countries or disregard principles of responsible agricultural investment.<sup>43</sup>

In addition to international private sector interest in African agribusiness, Africa's private sector itself is also increasingly attracting investment, with much of the funding coming from domestic banks and investors and the rest from the United States and Europe. The sector is also creating an emerging African middle class of hundreds of millions of consumers. Returns to investment in Africa are among the highest in the world (Boston Consulting Group 2010; Collier and Warnholz 2009; Roxburgh and others 2010). Success of ICT, especially mobile phone penetration, shows how rapidly a sector can grow. It also shows how the public sector can set the conditions for the exponential growth of a vital industry that could

transform the continent. Private capital flows are higher than official development assistance (and foreign direct investment is higher than in India). China, India, and others are also investing large sums in Africa. Furthermore, Africa is changing. African countries are increasingly relying on the private sector as the engine of growth and confronting governance problems, including corruption, head-on. Political support exists for the role of the state as regulator, facilitator, and agent of redistribution for equity, as shown in success stories<sup>44</sup> such as Malian mangoes, Kenyan cut flowers or, Rwandan tourism.<sup>44</sup>

Private sector investment in African agriculture should be broadly understood. The principal African investors are farmers themselves. They invest around \$100 billion every year in their farms, despite the almost total lack of credit facilities for the vast majority of them. However, foreign investments can be useful upstream (inputs) and downstream (processing) of agriculture to overcome the weaknesses of African industries, as well as in infrastructure to complement public funding. Experience shows that large-scale land-based investment can be justified from an economic efficiency point of view only in a few situations, where land is truly available, which means it is not used, and is acquired in all transparency.<sup>45</sup>

Priorities for increasing agricultural growth and productivity can be summarised in terms of "the four Is": (i) improving the investment

climate, through better incentives for farmers and private-sector engagement; (ii) infrastructure, including irrigation; (iii) innovation, the primary motor for productivity growth and competitiveness; and (iv) institutional capacity.

The investment climate for agriculture includes ensuring: (i) adequate incentives for farmers from sound macro-economic, trade and sector policies; (ii) increased incentives for businesses and improvements in the business climate; (iii) reduction of transport costs for agricultural products; and (iv) reduction of barriers to inter-regional trade. It also means confirming rights to land, particularly for women, to give farmers the security to invest in their land. Farming should not be penalized by the taxation, adverse international trade conditions and negative protection for agricultural commodities that often harm African farmers.

Investments in road and irrigation infrastructures are particularly important. The unit costs of transport are reportedly far higher in Africa than in parts of Asia. High transport costs raise the cost of purchased inputs such as fertilizer and bring down farm-gate prices which reduce incentives. Also, only 7 per cent of arable land in Africa is irrigated – the figure is even lower in sub-Saharan Africa – compared with 33 per cent in Asia. Irrigation and water management promise to raise production and help farmers to deal with a more variable future climate. Given the poor record of investments in



large-scale public irrigation schemes, the focus should be on small-scale schemes that can be managed by groups of farmers themselves.

Institutional and human capacity development is critical. Four types of institutions need to collaborate to support farmers in gaining access to credit, extension and markets, as well as in local and community development. These include: (i) the private sector, including businesses and farmers' and producers' associations; (ii) communities and civil society organizations; (iii) decentralized government institutions; and (iv) traditional sector institutions, which need reform to become more focused, efficient and effective. Collaboration among these institutions must be led and fostered by governments, with support from donor agencies as necessary. Governments, which have policy and financial responsibilities, need to drive decentralization and public-sector reform; opportunities to combine public and private initiatives should become apparent and ways to link small farmers with firms providing inputs, services and process or market outputs should emerge.

Greater attention must be given to making rural finance and credit markets viable in a challenging environment. This is an area where innovation is needed: new financial products need to be developed so that micro-finance can be profitable in rural areas where populations are dispersed and transaction costs high. The solution to farm investment constraints needs to come from improved agricultural incentives, better markets and increased profitability so that farmers can

invest in their farms and repay loans. This can be supported by accessible low-cost savings mechanisms such as postal savings accounts.<sup>46</sup>

## 5.1. Challenges for the Private Sector

Agriculture, which is Africa's largest private sector, faces the same problems as well as some that are distinctive to the sector. Farms, including family-run ones, are businesses and have needs similar to small enterprises, such as market stability, access to finance, and information. Yet a large number of government interventions exist, such as extension services and fertilizer subsidies, whose effectiveness is being questioned. Recent experience demonstrates the constraints that African agriculture faces in diversifying. Family enterprises have difficulty taking advantage of higher food prices and expanding domestic market demand. Furthermore, because 93 percent of African agriculture is rain-fed, improving resilience to the harmful effects of climate change (including floods and droughts) is particularly challenging, given the limited installed water storage capacity across the region, among other things. Improved agricultural water management, better transport, and access to cheaper energy are essential conditions to securing access to markets and improving the competitiveness of farming businesses. At the same time, opportunities exist to enable small-scale entrepreneurs in agriculture, manufacturing, and services to scale up.

Africa is urbanizing rapidly, opening up possibilities for clusters, growth poles, and agglomeration externalities. To fast-track such a development path, Africa may benefit from the kind of industrializing policy that has facilitated growth and employment creation in both advanced and developing countries. Because many of the most important government failures (poor policies and governance, for instance) are industry-specific, the first and least controversial type of industrial policy is to focus reforms and public investments on the industries and locations of highest growth potential. Industrial policy can also be useful in addressing "market failures." Although direct government interventions in support of specific sectors ("picking winners") have in the past been ineffective—because they were directed at sectors that were ultimately not viable or were undermined by governance issues—recent research has documented the extent to which industrial policy has been effectively applied in many advanced and developing countries to spur growth in new sectors of the economy (Lin and Monga 2010).

Despite the greater emphasis on the private sector and signs of its dynamism, Africa's private sector growth has not been sufficiently poverty reducing, nor is such growth clearly sustainable. Most African enterprises are small (often employing only household members) and suffer from low productivity. Although productive formal sector jobs are growing at the same rate as GDP in countries such as Uganda, this rate is not enough to absorb new entrants to the labour force.

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The underlying reason is the legacy of rapid population growth, which is only beginning to decline in some countries in the past decade, combined with a poor investment climate. Africa's ratio of private investment to GDP is half of Asia's.

Africa's weak investment climate is caused by three main factors: (a) poor infrastructure, (b) poor business environment (policies and access to finance), and (c) insufficient technical skills. Africa's infrastructure seriously lags that of other developing regions, and the gap is widening over time. Moreover, because of their small scale and limited competition, Africa's infrastructure services are typically several times more expensive than those in other parts of the developing world. This factor lies behind the cost disadvantage African exports suffer in world markets and is one of the obstacles to the productive development of rural and urban areas.<sup>47</sup> There are five distinctive features of the enterprise structure in Africa that need to be addressed by African Governments if they are to succeed in promoting entrepreneurship, private sector development and intra-African trade (UNIDO 2008; UNCTAD and UNIDO, 2011). These are (a) high and rising informality; (b) the small size of African enterprises; (c) weak inter-firm linkages; (d) the low level of competitiveness; and (e) the lack of innovation capabilities.<sup>48</sup> It is therefore evident that the challenges of attracting investment into Africa and the challenges of promoting private sector development and intra-African trade largely overlap.

A common feature of African countries is that they have

relatively large informal economies. Although it is difficult to give a precise indication of the degree of informality in Africa, recent estimates suggest that for sub-Saharan Africa, the informal economy accounts for about 38 per cent of GDP compared to 18 per cent for East Asia and the Pacific, 27 per cent for the Middle East and North Africa, 25 per cent for South Asia and 35 per cent for Latin America and the Caribbean. It has been suggested that one of the main reasons why firms often choose to remain informal is that it allows them to avoid the cost of paying taxes and complying with regulations. Informality inhibits enterprise development because informal enterprises are not registered businesses and therefore operate outside the legal framework, which means they have very limited access to the basic infrastructure and finance needed for growth. There is a need for policy actions to stem the rising level of informality in Africa as a crucial step towards enhancing private sector development and promoting intra-African trade.

Firm size in Africa is highly skewed towards micro- and small-scale enterprises. While some large firms exist on the continent, medium-scale enterprises that play a crucial role in the economic development of emerging and developed economies are either absent or few in number. African firms also exhibit weak inter-firm linkages. For example, there is limited linkage between the formal and informal economies, between small and large firms and between domestic and foreign firms. Intense competition arising from global economic integration has created the need for large firms (both domestic

and foreign) to establish business linkages with SMEs by integrating them into their supply chains. Such linkages enable large firms to reduce input costs, increase productivity, shorten lead times and focus on their core competencies.

Enhancing the competitiveness of domestic firms is critical to promoting intra- African trade. Africa currently accounts for less than 4 per cent of global trade, due in part to its low level of international competitiveness.

The Africa Competitiveness Report 2009 indicates that Africa is 19 per cent less competitive than East Asia and 18 per cent less competitive than South Asia, based on cost shares as indicators of competitiveness. In the report, Mauritius, Morocco, Namibia, South Africa and Tunisia are listed as the best performers in Africa based on the enabling trade index, which reflects how factors, policies and services within a given country facilitate the free flow of goods over borders and to destinations. However out of 118 countries included in the index, only Mauritius and Tunisia ranked among the top 50.

Unfortunately, African countries generally have a very weak knowledge base and lack enterprises with innovative capabilities. One way African countries can develop their innovative capabilities is by investing in research and development and encouraging the commercialization of the results through linkages with private sector firms. Indeed, for many policymakers in Africa, the process of innovation is often synonymous with inventions or major technological breakthroughs that take place in

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specialized scientific or research and development centres. Although such activities are vital for advancing the frontiers of technology, they contrast radically with the reality of the innovative process in a highly competitive environment. In the current dynamic and open market environment, innovative activities are aimed at maintaining competitive advantage and tend to be continuous, incremental and adaptive and to take place predominantly at the enterprise level.

## The potential of agribusiness<sup>49</sup>

Agriculture and agribusiness together account for nearly half of GDP in Africa. Agricultural production is the most important sector in most African countries, averaging 24 percent of GDP for the region.

Agribusiness input supply, processing, marketing, and retailing add about 20 percent of GDP. Global experience suggests that with growing incomes and urbanization driving the commercialization of agriculture, the shares of both downstream and upstream agribusiness activities are poised for rapid growth.

There exist strong growth opportunities for the agribusiness sector. Both domestic and global markets are experiencing strong demand, which is likely to continue even as domestic demand accelerates. The return to economic growth in Africa since the 1990s, burgeoning urbanization, and buoyant global commodity markets now provide unprecedented market opportunities for Africa to develop a competitive agribusiness

sector. Urban food markets are set to increase fourfold to exceed US\$ 400 billion by 2030, requiring major agribusiness investments in processing, logistics, market infrastructure, and retail networks. The growing middle class is also seeking greater diversity and higher quality in its diets. The most dynamic sectors overall are likely to be rice, feed grains, poultry, dairy, vegetable oils, horticulture, and processed foods for import substitution, along with the traditional tropical exports and their derived products (especially cocoa, rubber, cashews, and palm oil), together with some higher-value horticultural crops, fish, and biofuels for export.

Private sector interest in African agribusiness is unprecedented. The past decade has witnessed an upsurge in interest from the private sector in African agriculture and agribusiness, including interest from foreign investors and investment funds. The challenge is to harness investors' interest in ways that generate jobs, provide opportunities for smallholders, respect the rights of local communities, and protect the environment. Going forward, a key challenge is to curb speculative land investments or acquisitions that take advantage of weak institutions in African countries or disregard principles of responsible agricultural investment.

Despite the enormous potential of agribusiness development, different constraints still exist. According to the World Bank, they can be grouped in 4 categories:

- Erratic policies in agricultural output and input markets and trade

- Limited access to land and respect for community land rights (see Deininger and Byerlee 2011).
- Poor infrastructure and high transportation costs (see the World Bank flagship report on Africa's infrastructure (World Bank 2010).
- Difficulties for smallholders and small firms to access technologies, information, skills, and finance (see the World Development Report on agriculture (World Bank 2007d).

## 5.2. Private Sector Investment in Agriculture: the Growth and Development Corridors

The private sector is beginning to view agricultural investment differently. Investors are increasingly interested in investment in agriculture, previously viewed as offering lower returns and being prohibitively risky, particularly if there are ways to mitigate risk through the right policies and the balance between public and private investment. This shift will help integrate agriculture more significantly in the Development Corridors, where substantial investment is needed in additional infrastructure, including secondary and tertiary roads to connect farmers to markets, railways and better port facilities, along with agro-processing and storage facilities.



The Agricultural Growth Corridor concept is an innovative way to finance regional development and lift people out of poverty. The concept has a public-private partnerships approach, and takes the entire value chain into perspective, aiming to improve efficiency through targeted investments.

The corridors involve cooperation between African governments, private companies, donors, development institutions and academia. The concept includes improved financing facilities and credit schemes, especially for smallholders and agro-dealers. By easing farmers' access to regional and international markets, the goal is to drive rural development and economic growth in Africa. SAGCOT is also a pilot green corridor.

Growth corridors promote efficient use of resources by concentrating capital on the area of greatest agricultural potential. In such cases, eliciting a quick supply response that can generate virtuous loops is central for the success of the initiative.<sup>50</sup>

This investment could piggyback onto public and private investments in infrastructure and onto new business activities stimulated by the Development Corridors, such as the "Agricultural growth corridors projects" which are being created with the support of the World Economic Forum. These aim to establish favourable conditions for industrial agriculture, led by private companies, on millions of hectares of dedicated agricultural land. So far, several corridors have been set up, covering millions of hectares, principally in Southern Tanzania and Mozambique.<sup>51</sup>

These new dynamics around agriculture have also shifted focus to small farmers in a way that is new in the history of the Development Corridors. When the Development Corridors were first tested, the only efforts to integrate small farmers were on a project-by-project basis, but this proved much too slow to effectively capture the momentum behind anchor projects and related investments, and small farmers were ultimately left behind. New ways of integrating small farmers into commercial arrangements like contract farming and outgrower models—which is now the standard in a number of industries including, notably, sugar—were also not fully tested or understood. As markets develop and the chances to reach more consumers increase, so must farmers' ability to produce more efficiently and to meet new market specifications. With increased demand in the market comes increased demand for market information and business services as well. Persuading companies to buy supplies locally, process more in-country, and even hire labour locally requires education and negotiation. The opportunities for business expansion and densification are greater if civil society organizations and like-minded businesses work together to promote greater transparency, improve the investment climate, reduce trade barriers, and, ultimately, focus government attention on removing other barriers to more diversified economic growth.

Currently, two regions have been identified as potential breadbaskets. Both contain large areas with high agricultural potential as well as

a backbone of infrastructure to build on: the Beira Agricultural Corridor (BAGC) in Mozambique with connection into Zambia and the Southern Agricultural Corridor of Tanzania (SAGCOT) that extends from the port of Dar es Salaam into Zambia. By connecting these areas to infrastructure, efficient logistics providing inputs, storage and transportation to markets, the goal is to forge viable value chains supporting both large-scale and smallholder farming. Investment blueprints have been developed, describing opportunities and strategies over the coming 20-year period. The private sector is very active and, with the World Economic Forum (WEF), is driving activity and coordination on both corridors. Critically, the SAGCOT has support from the Tanzanian Government at the presidential level. So far, both corridors have struggled with the issue of how to engage agricultural stakeholders more broadly, and both are still searching for the right governance structure.<sup>52</sup>

### 5.3. PPPs for improved infrastructure

Public-private partnerships offer potential to accelerate and better manage investments in infrastructure. Given the private nature of irrigation as a productive input, the private sector has a role in investing in irrigation. Yet the high initial costs and risks involved—especially in the absence of secured, tradable land rights for investors and smallholders—often make it necessary for the public sector to provide irrigation services. The private sector sometimes contributes



by building access roads to large plantations, but it has few financial incentives for more general financing of rural roads. Instead, the lack of roads and other basic infrastructure is seen as an impediment for private actors to invest in rural areas. Public investment is critical, but communities themselves, through community-driven development grants, can also contribute to strategically upgrading rural roads.

Public-private partnerships are often considered in the context of traditional infrastructure such as irrigation and roads, but they can also help fill important gaps in market infrastructure. To come to terms with underutilized storage left over from the parastatal era, the Government of Uganda provided storage facilities to Uganda Grain Traders Ltd., a company formed by 16 national grain trading companies for coordinating processing, storage, and quality control for export markets. Public investment to set up more advanced and strategically located wholesale markets can stimulate the growth of regional and urban wholesale markets and make it easier to improve quality and safety standards, especially for burgeoning fresh produce markets. These investments in hardware can be most effective when combined with market software (market information systems, for example) and collective action by traders themselves. Similarly, with the need to maximize the shelf life of fresh fruits and vegetables, public-private partnerships have worked to overcome the high startup costs involved in building cold chains. Two examples are Kenya's fresh

fruit and vegetable terminal and Ghana's cold storage facilities at the main port, each financed partly by government and privately managed. As with public-private partnerships in irrigation, successful partnerships to support markets require a generally advantageous business environment that provides access to markets and finance for private sector participants.<sup>53</sup>

A major challenge to effective partnering with governments is that stakeholders such as farmers' organizations, the private sector and community-based organizations are not always sufficiently represented in country strategy formulation, programme design, policy formulation and project execution. This has allowed gaps in ownership which undermines the effectiveness of investment projects and other donor funded interventions. Despite the original intentions, sector wide approaches are generally confined to agriculture ministries and have concentrated attention on the use of central government resources while neglecting the needs of farmers' organizations and the private sector. Moreover, building political consensus on sector policy and strategy is often complicated by the involvement of many different ministries and government institutions, including decentralised agencies, local governments, and a multitude of other national and international actors, and in particular the private sector. Debates as to the appropriate mix of public and private investment continue, but little has been achieved in terms of improving the public-private sector interface.

### 5.4. Private Sector Research and Development

The private sector still plays a limited role in agricultural research and development (R&D) in sub-Saharan Africa (SSA). Private investment tends to be regionally limited—much of it occurs in South Africa—and focuses on a highly limited range of commodities, primarily hybrid maize.

The least developed source of sustainable financing for agricultural R&D in SSA is the private sector. Cultivating such private-sector funding involves developing a more explicit market demand for the products of agricultural research, which are also often associated with enhanced intellectual property rights. Collective action by farmers and related agribusinesses (often through formal associations), for example, has the potential to generate substantial additional resources for agricultural research in the region. These added resources are usually generated through some type of tax on specific commodities, either on exports or on supplies moving through a centralized marketing or processing supply chain. An added benefit of this approach is that decision-making on the use of the resulting funds would generally rest with producers and other stakeholders in the relevant value chain. Regulatory reforms also need to be implemented to encourage the spill-in of international technology.<sup>54</sup>

Although private investment in agricultural research and development (R&D) in Africa south

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of the Sahara has been limited to date—particularly compared with Asia and Latin America—but it is growing rapidly. We observe this increase especially in the seed industry. A recent study<sup>55</sup> of five African countries—Kenya, Senegal, South Africa, Tanzania, and Zambia—estimated that about US\$62 million was spent on private R&D. Of this \$62 million, \$50 million was spent in South Africa.<sup>56</sup> About half of the private research is conducted by African firms, some of which are regional multinational corporations, such as Seedco based in Zimbabwe and Illovo based in South Africa. The other half was spent by multinational firms headquartered outside Africa, such as DuPont and Monsanto. The seed industry accounted for the largest share of R&D expenditure in all of the countries, followed by the plantation and processing industries, such as the sugar industry.

Among these five countries, private investment in agricultural R&D grew fastest in South Africa, doubling between 2001 and 2008. Two major reasons for this growth in South

Africa were (1) the liberalization and privatization of the agricultural input and output markets and (2) the growing demand for modern agricultural inputs and food due to trade liberalization and economic growth elsewhere in Africa.

Private agricultural R&D has led to increased yields of several important crops in Africa. The adoption of proprietary hybrids of maize increased yields in Tanzania. Private sugarcane research in South Africa increased productivity there and elsewhere in southern Africa. Many studies show that proprietary genetically modified maize and cotton improved the yields, incomes, and health of smallholder farmers in South Africa and Burkina Faso.

Private agricultural R&D in Africa is likely to grow faster than public sector R&D, which grew by one-third from 2000 to 2011. The basis for this predicted private growth includes several factors:

- Demand for agricultural products and processed goods will increase

due to rapid economic growth.

- The growth of public-sector research by national programs and international institutes in Africa provides opportunities for firms to create proprietary maize hybrids and other innovations.
- Tariffs and technical barriers to trade in agricultural inputs are declining, and foreign investment is increasing.
- The options for protecting intellectual property (such as hybrid plant varieties) and legal protection of intellectual property (such as patents) are growing stronger.

The key policies for African governments that want to encourage private-sector R&D and maximize its impact are support for public research, removal of barriers to trade in technology, continued liberalization and privatization of agribusiness, and strengthening of intellectual property rights.<sup>57</sup>



## 6. Successes and opportunities for African Agriculture

### 6.1. Drivers of success: a combination of factors

Success stories can be found among African countries, in particular in the processing of local food staples such as cassava in Nigeria and millet in Senegal. The scope for enterprise growth and innovation in the staples sector should be significant in Sub-Saharan Africa, judging from the projected rise in urban demand for local food to \$150 billion by 2030. The same projections indicate potential income gains of \$30 billion for local smallholders, should African countries succeed in positioning domestic sectors competitively in these markets (NEPAD 2009).<sup>58</sup>

Examples of successes include the very rapid growth in small-scale production of first coffee, in the 1950s, and then tea, from the 1960s, in highland Kenya. Farmers were allowed from 1954 onwards to plant these crops and did so with success and enthusiasm, supported by co-operatives for coffee and a highly effective state company for tea, the Kenya Tea Development Authority. Farmers did not devote all their land to the cash crops: they continued to grow maize, beans and other food crops. Maize production was improved by widespread adoption of hybrid maize varieties bred for Kenyan conditions. Some farmers were also able to invest in a few cows and intensive, stable-fed dairying was added to the portfolio.

In the last two decades many farmers have also produced horticultural crops, some for export — Kenyan green beans, for example, can be seen on the shelves of supermarkets in Europe — but even more for the increasingly large domestic market in Nairobi. Did intensification in this case lead to over-use of natural resources? No: on the contrary, with productive fields, farmers invested in terraces, in planting trees on field boundaries, using more manure and fertiliser.

On the other side of the continent, in West Africa, cotton production expanded rapidly in the 1980s and 1990s across the guinea savannah zone — north of the forest belt and south of the Sahel. In this case, production was organised by state-owned textile development companies that supplied inputs on credit and collected the crop.

Many of the more recent growth spurts have seen food produced for domestic markets: in the 1980s, examples include hybrid maize in Zimbabwe, the Southern Highlands of Tanzania, and Northern and Eastern Provinces of Zambia — in all cases with small farm production organised by state agencies. Smaller-scale booms in marketed food crops include rice in the Malian inland delta of the Niger, open-pollinated varieties of maize in the middle belt of Nigeria, and peri-urban production of dairy, fruit and vegetables for the city of Kano.<sup>59</sup>

IFPRI surveyed specialists to identify successes in African agriculture where there had been

“a significant, durable change in agriculture resulting in an increase in agriculturally derived aggregate income, together with reduced poverty and/or improved environmental quality”. (Haggblade et al. 2003, ; see also Gabre- Madhin and Haggblade 2001). They reported many technical advances, including hybrid maize varieties in Zimbabwe and Kenya, as well as open-pollinated maize in West Africa; use of improved bananas in East Africa; horticulture and fruit produced by smallholders on contract in Kenya; cassava resistant to pests and diseases that had contributed to large increases in cassava production in West Africa and parts of south-eastern Africa; cotton in West Africa; and smallholder dairying in Kenya.

Not all of these successes have been sustained. On the contrary, they have often been sensitive to prevailing prices, in some cases linked closely to world market prices, as well as to state support and organisation. On the other hand, one of the most remarkable stories of long run progress comes from Burkina Faso, where cereals production — in a poor, landlocked, Sahelian country frequently best by drought — has increased over forty years by the same amount as Vietnam, generally regarded as a green revolution success in Asia.<sup>60</sup> Burkina Faso success managed to conserve soil and water by use of stone bunds and improved traditional planting pits ('zai') to retain water and topsoil; plant trees,

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keep livestock in semi-intensive systems and apply manure to the fields; multiply collective institutions to manage wells, natural resources, village cereal banks, and schools.

The farming sector needs a wide range of institutions: financial institutions to provide access to credit, insurance companies to cover risks, scientific research institutions to improve crop varieties and identify new production and processing techniques, partners able to offer economic and technical support, information systems to assist in positioning in markets, and so forth.<sup>61</sup>

Government interventions can also play a role in the success of agricultural enterprises and industry development. It is important that such interventions are focused on industries and locations with latent competitive advantage and do not create opportunities for rents and capture. Proactive support by government can be justified in the case of large, positive externalities (for example, building new infrastructure that can be used by other industries) or significant market failures (for example, coordination issues or high entry costs and risks for first movers). Specific examples of the success of targeted government interventions are Kenya's cut flowers and, on a smaller scale, Mali's mangoes. In the case of Kenya's cut flowers, government intervened by providing timely and accurate access to information as well as by facilitating technological improvements with attention to environmental stresses linked to water use. Between 1995 and 2002, Kenya's cut flower exports grew by 300 percent. In the case

of Mali's mangoes, government intervened through modernization of export infrastructure and practices and support for quality control and for the value-chain organization. As a result, mango exports expanded from 2,867 tons in 2005 to an estimated 12,452 tons in 2010.<sup>62</sup>

### - **Advances in farm technology**

Advances in farm technology, such as improved seed varieties, have been adopted by the majority of farmers in certain areas and for specific crops: hybrid maize in Zimbabwe in the 1980s and in Kenya since the 1960s are good examples. More recent examples include advances with cassava and rice: in one year in Uganda, mealy bug infestation led to a 90% loss in the country's cassava harvest. However, IITA has developed cassava varieties that are resistant to the mealy bug, which has triggered considerable increases in cassava production in the continent. WAREDA has also developed the NERICA rice variety, which has overcome a longstanding constraint that African rice varieties have lower yield and poorer taste than Asian varieties, but the latter are less resistant to African pests and diseases. So far NERICA looks extremely successful at increasing yields, and there are high growth rates of adoption in eastern Africa as well as western Africa.

### - **Use of additional inputs**

Although the average use of manufactured fertilizer may be low in Africa, in some areas such as highland Kenya use is similar to levels seen in Asia. Obstacles to use are less technical, more matters of logistics and the ratio

of prices between the local cost of fertiliser on farm and the value of the crops grown. Recent promising developments include micro-dosing, where fertiliser is applied more precisely in time and space, thereby economising on fertiliser and gaining greater impacts on yields per unit of chemical. This makes more sense when fertiliser is relatively expensive compared to labour.

Experiences from Kenya and Malawi provide examples of what can be done. In 2005/06 the Malawian government implemented a universal subsidy on a rationed amount of maize seed and fertiliser, despite the strong disapproval of donors such as the Bank and the IMF. In the four subsequent seasons, harvests have exceeded national requirements and records have been broken. But the costs have risen from an initial US\$50m to over US\$200m, prompting questions of how sustainable this is, and what the opportunity cost of the programme is (FAC 2009).

Less well publicised is the Kenyan experience of liberalising fertiliser markets in the early 1990s. The response from private importers, wholesalers, and local input suppliers has been good. Small farmers now can obtain fertiliser at an average distance of 3.4km, down from the previous 8.1km. The cost of getting fertilizer from Mombasa to the growing areas has been much reduced as logistics have been improved. More small farmers now apply fertiliser than before and it has contributed to increased yields. All this has been achieved at virtually no cost to the public budget (Ariga & Jayne 2009).

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## - **Soil and water management**

Although less than 4% of the crop area is currently irrigated, the limitations may be as much economic as technical. Where there are prospects of growing high value crops in dry seasons, farmers can be quick to improve their irrigation, as seen in the Fadama valley lands in areas close to Kano where farmers have introduced diesel pumps to lift water to their plots where previously there were only shadufs in use. Some irrigation schemes that previously had disappointed in the yields achieved have been revitalised when better management has been introduced, as seen in the Office du Niger rice-growing scheme of Mali.

Investments in soil and water conservation have been undertaken, but only when it has been proved that it is profitable to do so. Good examples are the fanya juu terracing of Machakos and other parts of upland Kenya, and the planting pits and bunds deployed on the central plateau of Burkina Faso. In the fight against pests and diseases, major successes have been scored in vaccinating cattle against rinderpest, producing cassava that resists mosaic virus, and in clearing the West African savannah of the black fly that causes river blindness in humans and so deterred use of potential arable land.

## - **Potential of uncultivated land**

Africa's land potential has again been recognised. The World Bank published (2009a) an assessment of the potential of the Guinea Savannah, a vast area of some 700m ha<sup>2</sup> that covers more than a third

of the continent, and of which less than 7% is currently under crops. Until now the Guinea Savannah has been largely ignored, partly since the productive potential is medium rather than high, but largely since much of it was relatively inaccessible for lack of road access and there was little effective demand for what it could produce.

Areas geographically similar in Northeast Thailand and the Cerrado of Brazil have been transformed into major agricultural exporters: with investment and the right policies, argues the Bank, the experience could be repeated in Africa. Given future increased demand within Africa, the potential to displace currently imported food, plus possible future markets in biofuel feedstock and supplying the rapid increase in demand in Asia for vegetable oils, animal feed and other produce, large tracts of the Guinea Savannah could be tilled creating jobs, incomes and export earnings.<sup>63</sup>

## - **Information and communication technologies**

Increasingly, African farmers live in areas covered by telecommunications networks and can get access, albeit through loan or hire, to mobiles. Although the primary use of phones may be social, they are being used to convey market information and even to transfer money. There is clear potential for passing farmers and land managers information on physical conditions, and above all short-range weather forecasts.

Information technologies have already delivered some benefits to

farmers through mobile phones in delivering economic information. There may be further applications through remote sensing with information on physical conditions passed rapidly to farmers and other land managers through cell networks.

## - **Use of biotechnology**

Although some applications are controversial, biotechnology may allow progress in solving some of the less tractable issues in crop breeding, such as improving drought resistance and encouraging nitrogen fixation. A key part of the challenge to scaling up research, development, and extension efforts will be to strengthen institutions that deliver innovations adapted to African agriculture and to build effective private-public partnerships (Binswanger 2009). There is broad agreement that investment in research pays off (World Bank 2007) and that they should be increased (Chicago Council on Global Affairs, 2009).

## - **Making use of traditional practices encouraging sustainable agriculture**

Previous development strategies to increase agricultural productivity were predominantly based on the industrial agriculture model which has often proven to be environmentally, socially and/or economically unsustainable.

Sustainable agriculture shifts away from artificial methods of increasing yields towards focusing on the growing capacity of the natural inputs. This can be achieved by using a variety of techniques without affecting the environment,

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e.g., crop rotation, soil enrichment, and natural pest predators. Crop rotation involves growing different crops in the same field instead of planting the same crop every season. This helps to ensure the long-term health of the soil because rotating crops with nitrogen-fixing crops replace nutrients back into the soil (Khan 2011; UN 2012). With the concept of sustainable agriculture, many development agencies have sought to combine the three factors of environmental, social, and economic sustainability. Agricultural sustainability aims to apply a systems approach to address different aspects of food security. It addresses above all the economic, social, and environmental dimensions of agricultural production. Thereby a systems approach is pursued, where a system consists of the interaction of different individuals and institutions—such as researchers, unions, retailers, consumers, policy makers—that need to be considered (Amekawa 2010; ASI 2012). This way different causes and impacts of

agriculture and food insecurity can be identified as well as addressed.<sup>64</sup>

### - **Market- and private sector-led agricultural growth**

Market- and private sector-led agricultural growth refers to the idea that agricultural growth must be market-led by reducing the role of the public sector and promoting public-private partnerships.

Like the 'green revolution' in Asian countries, the new green revolution for Africa involves improving and diversifying crops, improving irrigation systems, and advancing technologies (UK Food Group 2008). This also involves strategies to achieve minimum reliance on external inputs. For example, following a sustainable agriculture perspective means addressing scope and yield stability, stable food prices, and prices of fertilizers to meet economic sustainability (Amekawa 2010). Another aspect of economic

sustainability is to diversify farms to avoid monoculture, thereby mitigating the risks of economic losses and responding to extreme price fluctuations associated with changes in supply and demand (ASI 2012). Yet, this also requires a commitment to changing public policies, economic institutions, and social values.

Another important focus of sustainable agriculture is the policy level, i.e., enhance or introduce policies that promote environmental health, economic profitability, and social as well as economic equity. For example, supporting commodity and price programmes to allow farmers to realise the full benefits of the productivity gains. Another strategy is to modify tax and credit policies to encourage family farms rather than corporate concentration. It is important to address these policies at the local, regional, national, and global level, where the last is particularly important to facilitate international trade.

## 7. Moving forward: Agriculture and Structural Transformation in Africa

African economies have sustained unprecedented rates of growth in the past decade. This growth was mainly driven by exports of natural resources and commodities; improved macroeconomic management, a growing middle class, and increased domestic demand fuelled by consumption and increased political stability. However, Africa's growth has not been inclusive as poverty rates and inequalities remain high. In order to foster growth inclusiveness, African economies should shift from low to high productivity activities and sectors. Therefore, Africa needs to sustain a structural transformation from a resource-based economy towards an industry- or service-based economy. Only a few African countries, including Mauritius, South Africa and Uganda, have succeeded in structurally transforming their economies. Other African countries experienced some degree of structural transformation following different paths and at different speeds. Some countries may transform through low-wage manufacturing while others may transform through services or the agricultural sector. Delayed structural transformation in Africa has meant that labour is not moving out of agriculture fast enough to other more productive industrial or services sectors and as the share of agriculture in GDP is declining too fast. This was mainly explained by the lack of inclusive agricultural policies and the non-effective industrialization strategies of most African countries.

Achieving structural transformation will involve a greater degree

of industrialization of African economies. The agriculture sector should remain central to African economies in any process of transition. Fostering innovation and regional integration would also be very important for an effective transformation of the continent.<sup>65</sup>

### 7.1. Structural transformation

Structural transformation is the movement of labour from less to more productive sectors, such that overall labour productivity rises even with constant sectoral productivity levels. The problem in developing countries, as has been shown here for African countries, arises when: (i) labour migration stalls because of slow growth in the rest of the economy and/or rapid population growth; and/or (ii) value added in low productivity sectors such as agriculture fails to rise fast enough to erase the intersectoral productivity gaps. Countries with successful structural change have universally achieved two things: moving labour from lower to higher productivity sectors and raising output in lower productivity sectors. Progress has to be achieved in three key areas to lead to this outcome: labour movement, productivity growth, and trade competitiveness. The movement of labour between lower to higher productivity sectors raises average productivity and incomes in the economy, even without any changes in sector productivity levels. This effect is magnified when accompanied with concomitant sectoral productivity growth.<sup>66</sup>

Structural change during most of the first five decades of post-independence Africa has been productivity-reducing. It has been driven by negative diversification reflected in labour migrating from the underperforming, yet higher-productivity agricultural sector into an oversized, lower productivity service sector. In the aftermath of the failure of the first generation of import substituting, inward-oriented industrialization efforts of the 1960s, African governments had all but given up on the search for practical industrial policies. Meanwhile, agriculture continued to be confronted with significant policy and institutional challenges, moving from an environment marked with heavy direct and implicit taxation into an era of the controversial structural adjustment policies that significantly curtailed services support to the sector. The combined effect resulted in stagnation in the manufacturing sector and forced specialization in the primary sector.

The economic recovery of the last 15 years provides strong hope that African countries are starting to turn the page. The focus now should be on sustaining and accelerating the recovery process, enacting policies to raise productivity in the agricultural and service sectors, and revitalize the modern industrial sector. A good start is the continent-wide effort under the Comprehensive Africa Agriculture Development Programme (CAADP) to encourage evidence based policy planning and implementation and to increase investment in agriculture. However, it needs to be complemented with innovative industrialization policies to develop

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comparative advantage in higher-valued manufacturing goods. Future development strategies should seek to raise productivity in the service sector, which now has a large and growing share of low productivity labour. The objective of these strategies should be to modernize production processes and to promote innovation in the production of domestic and household goods ranging from metalwork to wood and leather processing to a host of handicraft products.

Managing a successful economic transformation poses two key challenges: (i) to raise labour productivity sustainably in the agricultural sector and the rural economy, while (ii) diversifying into higher valued goods outside agriculture in emerging higher productivity, urban-based manufacturing and service sectors. The factors determining the success or failure of countries to transform successfully are linked to the adequacy of human and physical assets, institutional and technological resources, as well as policy and coordination capacities.<sup>67</sup>

The patterns of structural transformation marked by an oversized, low productivity service sector and underperforming agricultural sector implies that African countries need a labour productivity raising strategy for the service sector; this strategy needs to go alongside smallholder-friendly agribusiness development. Industrialization strategies must therefore target, in the short and medium run, entrepreneurship growth in the informal service sector and the

traditional agricultural sector. Technology and innovation policies should seek to enhance technical capabilities and entrepreneurship in both agribusiness and informal sector industries. The current growth recovery is producing a rapidly growing middle class, and a sustained demand for processed urban food, housing, and related household equipment. The example of palm oil and rubber in Malaysia and cassava in Thailand demonstrate amply the significant potential for innovation and entrepreneurial growth in the agribusiness sector.

Technology and innovation policies also need to address the needs of the farming segment of the agribusiness value chain. African countries will in particular need to start investing heavily in the training, research laboratories, and other infrastructure required to develop biotechnological capabilities in order to compete in domestic and global agricultural markets. The current debate on genetically modified organisms is particularly unhelpful and distracting in this respect. The real strategic issue facing African countries should not be whether or not to allow or ban genetically modified organisms (GMO) based food. The real issue is whether or not African societies have enough capabilities in the broader field of biotechnology to catch up with the rapid developments around the world. They will otherwise be wiped out of the future global food systems.

The service sector has become a major reservoir of low productivity labour due to the pattern of structural change discussed earlier. Growth in that sector would therefore play an important

role in employment creation and productivity growth among African countries. In their studies of endogenous industrialization, Sonobe and Otsuka (2006; 2011) identify key sources of market failures that hamper modernization and growth in the informal sector. They include transaction costs related to information asymmetry and contract enforcement, innovative knowledge spillovers, and insufficient managerial capital. They propose the cluster based approach that has played a key role among Asian countries as a possible option for Africa. Required organizational competencies and other productive capabilities among enterprises in the informal sector are often tacit and not codified. Replication and imitation are therefore limited unless facilitated through clustering, which allows skill transfer through movement of labour.

In their recent comparative study of clusters between Asian and African countries, including Kenya and Ethiopia, Sonobe and Otsuka (2011) found that clusters in the latter countries tended to suffer from declining profitability as they expand through new entrants. The reason is that lack of continued innovation and the emergence of larger enterprises mean that the number of enterprises keeps growing and profitability keeps falling. Growth within the cluster eventually ceases. The leather industry in Ethiopia was the only exception. Given the lack of effective industrialization strategies, whether cluster based industrialization (CBI) or otherwise, it should not be a surprise that the authors did not encounter successful clusters. The lessons from Asia do point to some potential for CBI to work in Africa's

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informal sector. The double challenge of addressing productivity both in the informal and agricultural sector in Africa requires CBI strategies to also include the agribusiness sector. CBI in agribusiness would focus on areas and sectors with confirmed high productivity and technology spillover potential, such as peri-urban processing industries, river basin areas, and other high agro-climatic potential areas, as well as regional transport corridors. CBI activities would target industry-centered technology research, quality management infrastructure, regulatory services, trading infrastructure, smallholder integration, and vocational training. In particular, CBI would promote agribusiness value chain development through the development of a variety of activities—adapted packaging and processing technology, quality management services, institutional design of procurement and distribution networks, production technology and practices, and financial intermediation services.<sup>68</sup>

## 7.2. The role of agriculture in the transformation process

During the first three decades following independence, the ratio of food import costs to agricultural export revenues of African countries was nearly identical to the ratio between food imports and total foreign exchange earnings, implying that resources to pay for the excess demand for food came almost entirely from the agricultural sector

(Badiane 1991). Foreign exchange resources earned from agriculture help to meet the import cost of capital goods needed in other parts of the economy.

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

A historical review of the growth performance of the agricultural sector reveals that even if the most labour-intensive techniques are used, the achievable rate of agricultural growth is unlikely to be high enough to absorb the growing labour force (Mellor 1986). Analysis of industrialization by Syrquin (1989) in 100 countries has shown that the growth rate of value added and input use in agriculture is about 40 to 50 percent less than in manufacturing. While this finding underlines the fact that progressive industrialization is the engine for sustained long-term growth, development policy practitioners and analysts during the

time of independence for African countries in the late 1950s and early 1960s failed to recognize the centrality of agriculture in stimulating growth in the industrial sector itself.<sup>69</sup>

Johnston and Mellor (1961) define three phases, from early to late development stages, with distinct policy priorities in order to reconcile the above contradictions. In Phase 1, when the sector is dominated by subsistence agriculture, the focus should be on social innovation to remove institutional, social, and cultural constraints to improved farming practices. Programs dealing with land tenure, education, and related institutional infrastructure are required to align cultural and social practices with the need for future modernization of the sector. In Phase 2, emphasis is put on technological innovation and required systems for the provision of modern inputs and services to raise productivity and expand production based on labour-intensive, capital saving technologies. Key elements of the technical innovation systems include research and development and related education systems to expand production possibilities, cost-competitive input procurement and distribution systems, output marketing systems, plus the required public investment in necessary infrastructure and institutions. In Phase 3, when the opportunity costs of most inputs, in particular labour, are high and rising, the focus should move to deeper penetration into mainstream financial services markets in order to meet the considerable resource needs of a transition to capital-intensive labour saving technologies. Programs that are implemented in all three

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phases have to be cost effective and fiscally sustainable. Otherwise, they can become a burden on the rest of the economy and are bound to be abandoned. Sustainability is particularly problematic during the first two phases, when withdrawal of such programs can lead to a total collapse in the sector and loss of decades-worth of development. This outcome was typical in Africa in the years leading up to and through the period of structural adjustment programs of the 1980s and 1990s.<sup>70</sup>

African countries have been undergoing a remarkable agricultural and economic recovery process since the mid 1990s. Average growth rates for the agricultural sector and the overall economy have been hovering around 5-6 percent. Even during the recent crises in global food and financial markets, African economies have managed to maintain positive growth rates while economies in all other regions were contracting. More strikingly, the growth recovery has not only accelerated, it has also spread broadly across all major regions of the continent (Badiane 2008). The recent performance is taking place in the aftermath of low economic growth and stagnation during most of the preceding decades. Sustaining and accelerating the current growth recovery, therefore, requires a closer look at the process of economic transformation during the latter period and the factors underlying it.

### Trends in economic sophistication among African countries

An important part of structural change is that economies acquire greater capabilities as they mature to produce more sophisticated, higher valued goods. The basket of goods a country ends up producing competitively determines its level of economic performance and overall income level. Goods for which demand expands globally as incomes rise around the world can be exported in larger quantities and at high prices for a long time. Such goods are associated with higher levels of productivity and incomes. The more a country succeeds in producing such goods, the more wealth it will build, and the richer it gets over time. Using the expression by Hausmann et al. (2006), "countries become rich by producing rich-country goods". In other words, "countries become what they produce".<sup>71</sup>

The lack of progress toward product sophistication in the agricultural sector has real strategic implications. First, it is hard for the sector to raise labour productivity and incomes if it fails to achieve comparative advantage in higher valued products with greater income elasticity. Greater product sophistication would allow African countries not only to raise the overall and unit value of export to global markets, but it would allow them to capture a greater share of the fast growing demand for urban food in regional markets.<sup>72</sup>

### Labour Productivity in Agriculture

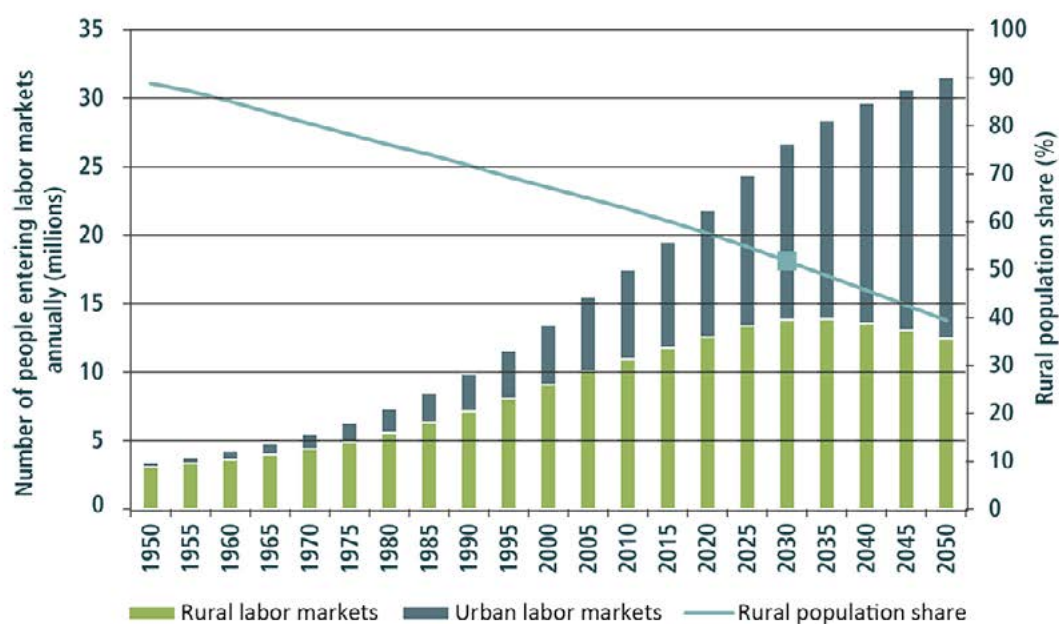
As a whole, sub-Saharan Africa has experienced slow growth in average labour productivity in the agricultural sector in the past three decades, indicating that little structural transformation has taken place in this sector. The annual growth rate of average agricultural productivity in sub-Saharan Africa was virtually unchanged in the mid-1990s, at around 0.1 percent to 0.2 percent, and has continued lagging other regions (Figure 3.8). Nevertheless, the regional average masks a wide variation in experiences, including productivity declines in many countries in sub-Saharan Africa and high productivity growth (and presumably structural transformation) in others.

The rate of productivity growth in agriculture is highly correlated with the growth of GDP per capita. Fertilizer use and the extension of agriculture to non-arable land are key factors in explaining the lower agriculture labour productivity levels in sub-Saharan Africa compared to Asia. Arable land has been declining by 1 percent a year in both regions. In contrast, non-arable agricultural land has been rising by 1 percent a year in Asia while it has declined by a similar magnitude among sub-Saharan African countries. With respect to fertilizer, while its use has increased by 3.5 percent a year among Asian countries, on average it has not risen in sub-Saharan Africa. Many governments in sub-Saharan Africa have been concerned with improving agricultural productivity, with some positive results.



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**Figure 13: Rural population share and the number of people entering rural and urban labour markets annually in Africa south of the Sahara, 1950-2050**



Source: B. Losch, S. Fréguin-Gresh, and E.T. White, Structural Transformation and Rural Change Revisited: Challenges for Late Developing Countries in a Globalizing World, Africa Development Forum Series (Washington, DC: World Bank, 2012).

### 8. Conclusion

Following decades of stagnation and even decline, African economies are growing again. Growth has been strong, broadly based, and sustained over more than a decade. Underneath the recovery are troubling trends that will need to be addressed effectively. The pace and pattern of economic transformation over the preceding decades suggest that structural change has been historically productivity-reducing. The reason has been the movement of labour out of an underperforming agricultural sector to an oversized, low-productivity service sector. The problem was made worse by the lack of effective industrialization strategies that prevented African economies from diversifying into higher productivity goods. Sustaining and building on the current recovery process to raise incomes and reduce poverty among African countries would require innovative strategies to revitalize agricultural growth.

Such strategies would have to consolidate the progress under CAADP. They would include a new approach to rural development with greater synergies between social service provision and productivity enhancing investments in order to maximize the impact of public expenditures on labour productivity in rural areas. A labour approach to industrialization policies is also needed to promote transition of African economies to higher valued products. In addition to conventional priority areas such as improved macroeconomic policies and infrastructure investment, there is a

need for technology and innovation policies to support enterprise growth not just in the formal industrial sector, but also the informal sector.<sup>73</sup>

Binswanger-Mkhize, McCalla, and Patel note hopeful signs for African agricultural development despite structural transformation having not yet occurred. Hopeful signs include the recent renewed economic growth, an end to the circular decline in agricultural prices, growing food demand at the national and regional levels, and increasing agricultural commitments by African governments. The authors recommend that countries seize the moment to support economic growth through country specific sound macroeconomic policies, removal of disincentives in the agricultural sector, increased agricultural technology investments, and improved agricultural institutions and services for farmers. The importance of aligning these strategies with the ongoing Comprehensive Africa Agriculture Development Programme implementation agenda is highlighted.<sup>74</sup>

The African ownership and leadership of NEPAD and CAADP played a key role in putting agriculture squarely on the regional and national development agendas.<sup>75</sup> Unfortunately, recent expenditure reviews suggest that budgetary support to agriculture is not meeting the CAADP target in most countries. Only Burkina Faso, Malawi, Mali, Niger, and Senegal surpassed the 10 percent target

in 2007, while a large majority of countries are still budgeting for agriculture at levels between 5 and 10 percent (Fan, Omilola, and Lambert 2009). A number of issues ranging from low stakeholder participation in the CAADP process to poor data availability and quality have further exacerbated the challenges of meetings these targets (Morton 2010).

Nonetheless, **CAAPD put agricultural development back on the agenda through a process of African ownership.** As a result, other complementary efforts were made to strengthen the contribution of agricultural science, technology, and innovation in the region's agricultural development. A hallmark of these efforts is the 2006 Framework for African Agricultural Productivity (FAAP), which provides a roadmap to improving agricultural productivity by enabling and accelerating innovation. FAAP responds to CAADP Pillar IV, which provides a strategy for revitalizing, expanding, and reforming Africa's agricultural R&D capacity and shifting away from a technological package approach to a more integrated innovation system approach that actively engages public, private, and civil society stakeholders (FARA 2006). Importantly, FAAP encouraged bilateral and multilateral donors to take a more coordinated approach to funding agricultural development programs; responding to stakeholder priorities; and harmonizing activities at the country, program, and project levels.

## Glossary

### Commodity

A commodity is a tangible good (usually a raw material, metal or basic agricultural products) that has value and can be exchanged in international trade.

### Employment

Persons in employment comprise all persons above a specified age who during a specified brief period, either one week or one day, were in the following categories: paid employment; self employment.

### FAO Food price index

The FAO Food Price Index is a measure of the monthly change in international prices of a basket of food.

### Farming system

A population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. Depending on the scale of analysis, a farming system can encompass a few dozen or many millions of households.

### Food access

A household's ability to acquire adequate amounts of food regularly through a combination of production, purchases, barter, borrowing, food assistance or gifts.

### Food availability

The amount of food that is present in a country or area through all forms

of domestic production, imports, food stocks and food aid.

### Food consumption

The food consumption refers to the amount of food available for human consumption as estimated by the FAO Food Balance Sheets. However the actual food consumption may be lower than the quantity shown as food availability depending on the magnitude of wastage and losses of food in the household, e.g. during storage, in preparation and cooking, as plate-waste or quantities fed to domestic animals and pets, thrown or given away.

### Food Insecurity

Food insecurity exists when people are undernourished as a result of the physical unavailability of food, their lack of social or economic access to adequate food, and/or inadequate food utilization. Food-insecure people are those individuals whose food intake falls below their minimum calorie (energy) requirements, as well as those who exhibit physical symptoms caused by energy and nutrient deficiencies resulting from an inadequate or unbalanced diet or from the body's inability to use food effectively because of infection or disease.

### Food Loss (FL)

The term 'food loss' can be defined as any reduction in food available for human consumption taking place in the food chain from the moment of harvest until the moment of consumption. 'Food loss' is a subset of PHL and represents the part of the edible share of food that is available

for consumption at either the retail or consumer levels but not consumed for any reason. It refers to the decrease in food quantity or quality, which makes it unfit for human consumption. It is important to note that not all food that is lost is suitable for consumption, such as banana peels or skins from vegetables.

### Food security

A condition that exists when all people, at all times, are free from hunger. Food security involves four aspects: (1) availability; (2) access; (3) utilization; and (4) stability

### Food Supply Chain (FSC)

A food supply chain (FSC) is 'a network of food-related business enterprises through which food products move from production through consumption, including pre-production and post-consumption activities'. Links that are typical in the FSC are Inputs producer distributor wholesaler retailer consumer. The food supply chain connects three important sectors of the economy – agriculture, the food processing industry and the distribution sectors'.

### Food Waste (FW)

At later stages of the FSC, the term 'food waste' is applied and generally relates to behavioral issues. 'Food waste' is the subset of food loss that is potentially recoverable for human consumption and can be divided into two categories – avoidable (inedible or edible before spoilage/damage) and unavoidable (inedible food material like vegetable peels, bones, etc.). A more clear definition of food wastage refers to

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the 'deliberate discarding of food that is fit to be eaten.

## Foreign direct investment

Foreign investment establishes a lasting interest in or effective management control over an enterprise. Foreign direct investment can include buying shares of an enterprise in another country, reinvesting earnings of a foreign-owned enterprise in the country where it is located, and parent firms extending loans to their foreign affiliates. International Monetary Fund (IMF) guidelines consider an investment to be a foreign direct investment if it accounts for at least 10% of the foreign firm's voting stock of shares.

## GNP per capita

A country's gross national product (GNP) divided by its population. Shows the income each person would have if GNP were divided equally. Also called income per capita. GNP per capita is a useful measure of economic productivity, but by itself it does not measure people's well-being or a country's success in development. It does not show how equally or unequally a country's income is distributed among its citizens. It does not reflect damage made by production processes to natural resources and the environment. It does not take into account any unpaid work done within households or communities or production taking place in the gray (shadow) economy. It attributes value to anything being produced whether it harms or contributes

to general welfare (for example, medicines and chemical weapons). And it ignores the value of such elements of people's well-being as leisure or freedom.

## Gross Domestic Product (GDP)

GDP is Gross domestic product. For a region, the GDP is "the market value of all the goods and services produced by labour and property located in" the region, usually a country. It equals GNP minus the net inflow of labour and property incomes from abroad.

## Gross national product (GNP)

The value of all final goods and services produced in a country in one year (gross domestic product) plus income that residents have received from abroad, minus income claimed by nonresidents. GNP may be much less than GDP if much of the income from a country's production flows to foreign persons or firms. But if the people or firms of a country hold large amounts of the stocks and bonds of firms or governments of other countries, and receive income from them, GNP may be greater than GDP.

## Informal economy

The informal economy refers to all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements. Their activities are not included in the law, which means that they are operating outside the formal reach of the law; or their activities are not covered in practice,

which means that – although they are operating within the formal reach of the law, the law is not applied or not enforced; or the law discourages compliance, because it is inappropriate, burdensome, or imposes excessive costs.

## Labour market

The labour market is the arena in which jobs and workers are matched, or where labour is exchanged for wages or payment in kind, whereas the labour force comprises the supply of workers to that market. Strictly speaking, the labour market is the context in which the labour force is constituted – the sea in which the labour force swims, so to speak. But the labour force is necessarily shaped by trends in the labour market (such as globalization and the informalization of labour). The labour market and its institutions are not neutral, but reflect power relations in the economy and society at large. Changes in the labour market are therefore gendered and produce changes in the gender structure of the labour force, for instance in occupational segregation, women and men's relative participation in employment, and so on.

## Least Developed Country (LDC)

Least Developed Countries are those assessed as having particularly severe long-term constraints to development. Inclusion on the list of Least Developed Countries is now assessed on two main criteria: economic diversity and quality of life.

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## Low Income Countries

Countries in the Low Income Group, as defined in Income Groups

## Millennium Development Goals (MDGs)

A set of eight international development goals for 2015, adopted by the international community in the UN Millennium Declaration in September 2000, and endorsed by IMF, World Bank and OECD.

## Poverty Reduction Strategies

Poverty Reduction Strategies are prepared by developing country governments in collaboration with the World Bank and International Monetary Fund as well as civil society and development partners. These documents describe the country's macroeconomic, structural and social policies and programmes to promote growth and reduce

poverty, as well as associated external financing needs and major sources of financing.

## Price

The amount of money required for the exchange of a good or service to take place. Prices are an important source of market information, providing the incentive for market actors' decisions. There are different types of prices:

Farm-gate price: the price a farmer receives for a product at the boundary of the farm, not including transport costs or other marketing services.

Wholesale price: the price of a good purchased from a wholesaler. Wholesalers buy large quantities of goods and resell them to retailers. The wholesale price is higher than the farm-gate price because of the marketing margin.

Retail price: the price of a good purchased from a retailer by a consumer. The retail price is higher than the wholesale price because of the marketing margin.

Import parity price: the price paid for an imported good at the border, not including transaction costs incurred within the importing country.

Export parity price: the price received for an exported good at the border, including transaction costs incurred within the exporting country.

## Purchasing power

The quantities of goods and services that can be bought with a given amount of money. It depends on income and prices.

## Acronyms

AAFT	African Agricultural Technology Foundation
AfDB	African Development Bank
AGRA	Alliance for a Green Revolution in Africa
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
CBO	Community-based Organization
CEMAC	Commission de la Communauté Economique et Monétaire de l'Afrique Centrale
CGIAR	Consultative Group on International Agricultural Research
CILSS	Comité permanent Inter-états de Lutte contre la Sécheresse dans le Sahel
CMAOC	Conference of Agriculture Ministers of West & Central Africa
COMESA	Common Market for Eastern and Southern Africa
CORAF/WECARD	West and Central African Council for Agricultural Research and Development
CSO	Civil society organizations
DAC	Development Assistance Committee
EAAPP	Eastern Africa Agricultural Productivity Program
EAFF	East African Farmers' Federation
EBA	Everything but Arms
ECA	United Nations Economic Commission for Africa
ECOWAS	Economic Community of West African States
EDF	European Development Fund
EIARD	European Initiative for Agricultural Research for Development
EPAs	Economic Partnership Agreements
EU	European Union
FAAP	Framework for African Agricultural Productivity

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FAO	Food & Agriculture Organisation of the United Nations
FARA	Forum for Agricultural Research in Africa
FDI	Foreign Direct Investment
FFI	Feed the Future Initiative
FNS	Food and Nutrition Security
FTF	Feed the Future initiative
GAFSP	Global Agriculture and Food Security Program
GDP	Gross Domestic Product
GFAR	Global Forum on Agricultural Research
GMO	Genetically Modified Organism
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
ICTs	Information and Communication Technologies
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
IFC	The International Finance Corporation
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILO	International Labour Organization
LDCs	Least-developed countries
LICs	Low Income Countries
MDG	Millennium Development Goal
MICs	Middle Income Countries
MFI	Microfinance Institution
NEPAD	New Partnership for Africa's Development

## Realising the Promise of Agriculture for Africa's Transformation

NGOs	Non-governmental organizations
ODA	Official development assistance
OECD	Organisation for Economic Co-operation & Development
PAEPARD	Platform for African European Partnership on Agricultural Research for Development
PAFO	Pan-African Farmers' Organisation
PPP	Public-private Partnership
PROPAC	Regional Platform for Small Farmer Organisations of Central Africa
PRS	Poverty reduction strategy
R&D	Research and Development
RECs	Regional Economic Communities
ROPPA	Network of Farmers' and Agricultural Producers' Organisations of West Africa
SACAU	Southern African Confederation of Agricultural Unions
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
UEMOA	Union Economique et Monétaire Ouest Africaine
UMAGRI	Farmers Union of the Maghreb
UN	United Nations
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
USAID	United States Agency for International Development
WAEMU	West African Economic and Monetary Union
WB	World Bank
WFP	World Food Programme
WTO	World Trade Organization



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European Commission-EuropeAid Development and Cooperation-Agriculture and rural development  
[http://ec.europa.eu/europeaid/what/development-policies/interventionareas/ruraldev/index\\_en.htm](http://ec.europa.eu/europeaid/what/development-policies/interventionareas/ruraldev/index_en.htm)

European Commission -Agriculture and rural development  
[http://ec.europa.eu/agriculture/index\\_en.htm](http://ec.europa.eu/agriculture/index_en.htm)

European Parliament - Committee on Development  
<http://www.europarl.europa.eu/activities/committees/homeCom.do?language=EN&body=DEVE>

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African Union  
[www.africa-union.org](http://www.africa-union.org)

African Development Bank  
<http://www.afdb.org/en/>

CTA  
<http://www.cta.int/>  
<http://brusselsbriefings.net>  
<http://agritrade.cta.int>  
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FAO. Rural Infrastructure and Agro-Industries Division  
<http://www.fao.org/ag/ags/agsdivision/en/>

FAO. Rural Gender-equitable rural employment  
<http://www.fao.org/economic/esw/esw-home/esw-genderdevelopment/esw-ruralemployment/en/>

FAO-ILO website Food, Agriculture & Decent Work  
<http://www.fao-ilo.org>

IFAD-Market access Portal  
<http://www.ifad.org/english/market/index.htm>  
<http://www.ifad.org/english/institutions/index.htm>

ILO-Decent work portal  
<http://www.ilo.org/global/topics/decent-work/lang--en/index.htm>

OECD-FAO. Agricultural outlook.  
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IMF (International Monetary Fund)  
<http://www.imf.org/external/index.htm>

NEPAD  
<http://www.nepad.org>

NEPAD-CAADP. The Comprehensive Africa Agriculture Development Programme  
<http://www.nepad-caadp.net/>

UNECA- The United Nations Economic Commission for Africa  
<http://www.uneca.org/>

UNDP-United Nations Development Programme  
<http://www.undp.org/>

UNESCAP-United Nations Economic and Social Commissions for Asia & the Pacific  
<http://www.unescap.org/>

UNSCN- United Nations System Standing Committee on Nutrition  
<http://www.unscn.org/>

USAID  
<http://www.usaid.gov/>

World Bank- Agriculture and rural development portal  
[http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTARD/0,,menuPK:336688-pagePK:149018-piPK:149\\_093-theSitePK:336682,00.html](http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTARD/0,,menuPK:336688-pagePK:149018-piPK:149_093-theSitePK:336682,00.html)

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AATF (African Agricultural Technology Foundation).  
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ACTION AID  
<http://www.actionaid.org/>

Action against Hunger  
<http://www.actionagainsthunger.org/>

OXFAM  
<http://www.oxfam.org/en>

### Research Organisations

African Economic Research Consortium  
<http://www.aercafrica.org/>

Center for Global Development  
<http://www.cgdev.org/>

CIRAD  
<http://www.cirad.fr/>

CGIAR-Consultative Group on International Agriculture Research  
<http://www.cgiar.org>

ECDPM  
<http://www.ecdpm.org/>

## Realising the Promise of Agriculture for Africa's Transformation

EIARD

<http://www.eiard.org/>

FARA-Forum for Agriculture  
Research in Africa

<http://www.fara-africa.org/>

IAASTD-International Assessment of  
Agricultural Knowledge, Science and  
Technology for Development

<http://www.agassessment.org>

IFPRI-International Food Policy  
Research Institute

<http://www.ifpri.org/34>

ODI -Rural employment and  
migration portal

[http://www.odi.org.uk/resources/  
search.asp?database=resources&the  
me=448](http://www.odi.org.uk/resources/search.asp?database=resources&the<br/>me=448)

Future agricultures

<http://www.future-agricultures.org/>

GFAR

<http://www.egfar.org/>

IITA. The International Institute of  
Tropical Agriculture

<http://www.iita.org/>

### Other websites

ASTI (Agricultural Science and  
Technology Indicators Initiative)

<http://www.asti.cgiar.org/>

GAFSP (The Global Agriculture and  
Food Security Program)

<http://www.gafspfund.org/>

IAASTD. United Nations Environment  
Programme environment for  
development. Division of Early  
Warning and Assessment.

International Assessment of  
Agricultural Knowledge, Science and  
Technology for Development.

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UK FOOD GROUP

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