



# Agricultural value chains in Sub-Saharan Africa

From a development challenge to a business opportunity

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Agriculture holds the key to broad-based economic growth, poverty reduction and food security in Sub-Saharan Africa (SSA). This is due to the importance of the sector for SSA economies, the extent of rural poverty and the dependence of 50 million small farms on agricultural incomes. It is well documented that growth generated by agriculture in SSA is several times more effective in reducing poverty than GDP growth in other sectors.

Agriculture is still the backbone of many African economies, generating 25% of GDP on average in SSA – and much more in many countries. The broader agribusiness sector is estimated to account for close to half of GDP. Developing the sector is also central to economic diversification in several SSA countries, e.g. Angola and Nigeria.

Agricultural development lags behind in SSA. While overall GDP grew at over 6% annually between 2001 and 2008, agricultural GDP grew at 3.4%. In a global context, SSA is the only region which has failed to improve agricultural productivity, due to various reasons including under-investment, poor infrastructure, insecure land tenure, unfavourable price policies and weak institutions.

Agriculture has huge potential in SSA. The region has vast amounts of uncultivated land – close to half of global availability, untapped water resources and large scope for improvements in inputs to increase yields. Boosting African agriculture is also seen as a way to fulfil increasing global demand.

Import dependency is growing in spite of this potential. In 2011, SSA imported USD 43 bn worth of agricultural commodities while exporting USD 34 bn worth, with obvious consequences in terms of ability to generate foreign exchange and vulnerability to global prices.

Developing smallholder agriculture is key, given the predominance of small farms and their efficiency when taking all inputs into account. Agribusiness companies increasingly partner with smallholders for the benefit of both. Unlocking SSA's agricultural potential also requires governments' commitment and investments, closing the infrastructure gap, facilitating trade and improving financing as well as skills and technology.

SSA is also attractive as a fast-growing consumer food market. Urban food markets are set to quadruple and the food and beverage markets to reach USD 1 trillion by 2030. The region's biofuel market is also growing.

There is increasing investor interest in SSA along the whole food supply chain, given its untapped potential for both domestic sales and exports in more conducive macroeconomic and political contexts.

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## Agricultural value chains in Sub-Saharan Africa

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### Contents

A. The importance of agriculture in SSA.....	3
1. For economic growth and employment	
2. To reduce poverty	
3. To feed the region	
4. To feed the world	
B. Agricultural development lags behind in SSA.....	9
1. Robust economic growth leaves the agricultural sector behind	
2. Slow agriculture growth in the global context	
3. A number of factors constrain yield growth	
4. Beyond agricultural production: Value chains are underdeveloped	
C. The agricultural potential in SSA is huge.....	14
1. Large scope for improvement in inputs to boost yields	
2. Around 50% of land available globally	
3. Untapped water resources, with less than 5% of cultivated land currently irrigated	
4. Agricultural output potentially doubling by 2020	
5. Impacts along the whole food value chain	
D. Unlocking SSA's agricultural potential.....	17
1. Developing smallholder agriculture is crucial	
2. Broader, more sustainable input use and irrigation	
3. Political commitment and public investment	
4. Closing the infrastructure gap	
5. Technology and human capital	
6. Facilitate trade	
E. Investing in agricultural value chains.....	22
1. Africa needs more agribusiness	
2. From a development challenge to a business opportunity	
3. Financing agriculture and agribusiness	
F. Conclusion.....	27



## Agricultural value chains in Sub-Saharan Africa

The potential of Africa's agriculture is a topic relevant to Africa and the world. In a context of growing population it belongs in discussions about food security, in Africa and globally. Developing the broad agricultural sector is also key to Sub-Saharan Africa's future – generating jobs, incomes and food. Most of the world's uncultivated arable land is in Sub-Saharan Africa (SSA) yet many African countries rely on imports to feed their people.

This provides in turn a strong case for investments in SSA's food value chain. On top of new productive land and large yield gaps, SSA offers fast-growing consumer markets.

### A. The importance of agriculture in SSA

Given that agriculture creates jobs, generates income, produces food and contributes to social stability, the sector is essential to SSA's development. Expanding it judiciously can pave the way to a future where Africa can feed itself and feed the world. In an effort to encourage countries to increase food security, reduce poverty, promote economic growth and create wealth through agricultural growth, the African Union has declared 2014 the year of agriculture and food security in Africa.

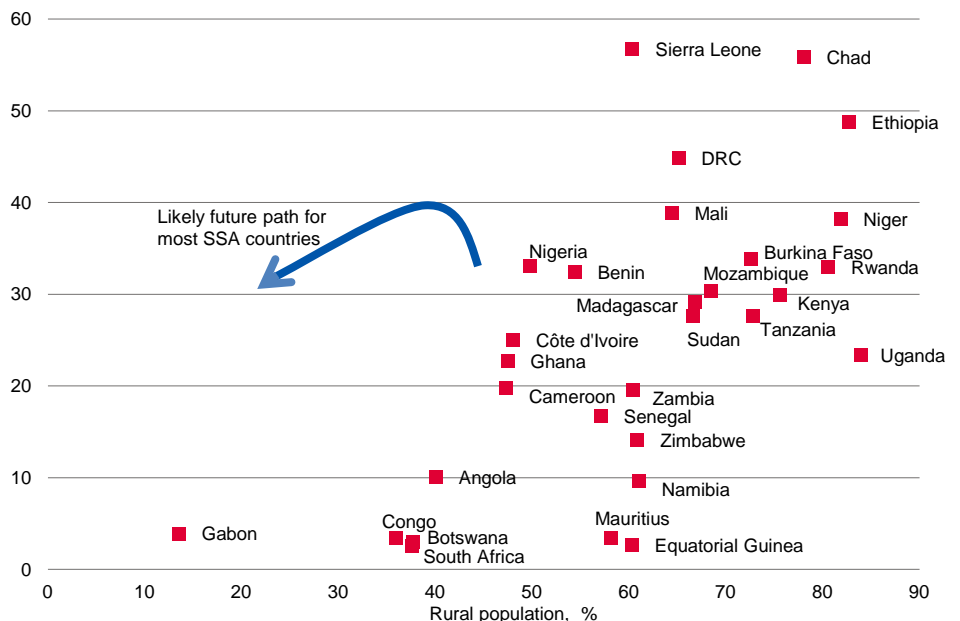
#### 1. For economic growth and employment

In many African countries, agriculture is the predominant sector of the economy, accounting on average for 25% of SSA's GDP and well above this level for many countries (see chart 1). It makes up close to half of GDP on average if one considers the broader agribusiness sector – including input supply, processing and retailing. Stronger agricultural growth can thus act as a multiplier for economic growth more generally.

Importance of agriculture in SSA

1

Agriculture, share of GDP, %



Note: Latest available data: 2012 for rural population, mostly 2012 and 2011 for share of GDP

Sources: World Bank, Deutsche Bank Research

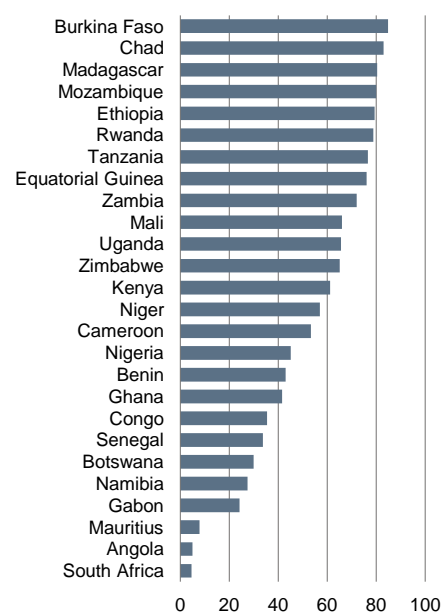


## Agricultural value chains in Sub-Saharan Africa

### Employment in agriculture

2

Share of total employment, %



Note: Latest available data

Sources: World Bank, Deutsche Bank Research

Job creation is one of SSA's top challenges and agriculture accounts for over half of total employment (see chart 2). Given that 63% of the population in Sub-Saharan Africa is rural and lives largely off agriculture, the extent and path of agricultural development has enormous economic and social implications. History shows that there are few pathways from an agrarian economy which do not involve an early agricultural revolution. Hence the arrow on chart 1 illustrating the likely future path for most SSA economies: grow the agricultural sector before other sectors take over.

Half of employment growth between 1999 and 2009 in SSA is due to growth in agriculture, according to the Food and Agriculture Organisation (FAO). Increased agricultural productivity generates employment. Indeed, in many parts of SSA, rather than through capital-intensive technologies, farming is done through small-scale, labour-intensive technologies which are difficult to mechanise – for example cotton hand-picking, tea harvesting, horticulture (cultivation of garden plants) and floriculture. Thus, rather than driving lower demand for labour, higher agricultural productivity creates jobs.

### Central for economic diversification in various countries

Various economies in SSA depend on exports of one or few raw materials. While resource wealth has been – and is expected to remain – a key engine of growth, lack of economic diversification poses risks – particularly given price volatility surrounding commodity markets and given the tendency of resource exports to drive up the real exchange rate and inflation (“Dutch disease”).

Developing the agricultural sector is a way to diversify the economy in some countries. Various SSA countries rich in raw materials have neglected other sectors like agriculture. For instance, Nigeria was self-sufficient in food in the 1960s and was a significant exporter of agricultural commodities (cocoa, nuts, vegetable oils). Similarly, Angola used to enjoy a vibrant agricultural sector and was the 4<sup>th</sup> largest coffee producer in the world. Seriously damaged by the civil war ending in 2002, agriculture currently generates only around 10% of GDP.<sup>1</sup> Both Nigeria and Angola are now significant importers of food (see chart 19) and Nigeria is the world's biggest rice importer. The agricultural sector in these countries is undergoing reforms and benefiting from increased investment in an effort to develop rural areas and diversify the economy, which is central to the governments' policy agenda.

### From agriculture to agribusiness

Given the important role of agriculture in SSA's economies and its position as the largest employer, it is central to structural transformation. Referring to the reallocation of economic resources from activities of low productivity to more productive ones, structural transformation includes both the rise of new, more productive activities and the movement of resources and labour from traditional activities to these newer ones. This can happen all along the agricultural value chain. For instance, once agricultural production has reached high levels of reliability and quality, value addition can be gained through the processing of agricultural commodities.<sup>2</sup>

Indeed, while the share of agriculture in GDP and employment declines as an economy develops, agribusiness value chains provide a way to economic

<sup>1</sup> See "Angola: Oil economy on a diversification path". Schaffnit-Chatterjee. DB Research. June 2013.

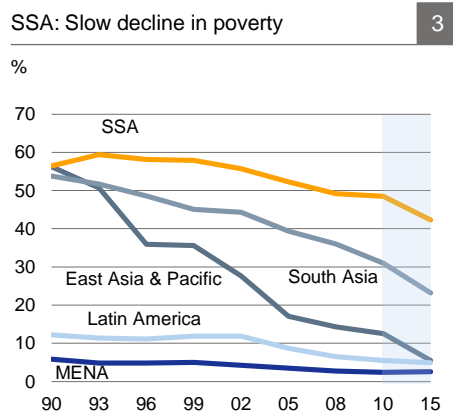
<sup>2</sup> For more on this, see African Economic Outlook 2013. African Development Bank. OECD. UNDP. Economic Commission for Africa. 2013.



## Agricultural value chains in Sub-Saharan Africa

growth, poverty reduction and the structural transformation of an economy. The agribusiness value chains span the provision of farm inputs upstream to value addition downstream like food processing through storage, distribution and logistics. As GDP per capita increases, the share of agribusiness typically rises from less than 20% to more than 30% of total GDP before declining, while agriculture's share of GDP falls from 50% of GDP or above to under 10%.<sup>3</sup>

### 2. To reduce poverty

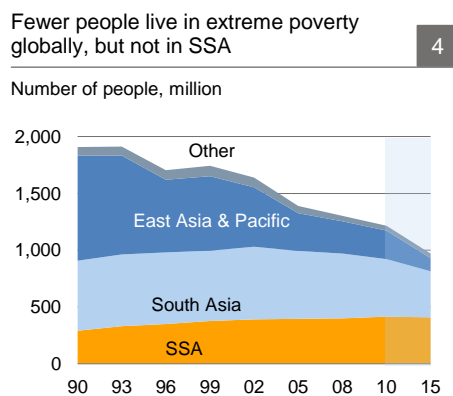


Sources: World Bank, Deutsche Bank Research

In spite of strong economic growth in the last decade, the poverty rate is over 40% in SSA: the share of the population living on less than USD 1.25 per day has changed little over the last decade as opposed to other regions like East Asia and South Asia (see chart 3). Some countries such as Mozambique, Tanzania and Burkina Faso have barely managed to reduce their poverty rates in spite of robust growth. The relationship between economic growth and poverty reduction is particularly weak in SSA. In absolute terms, the number of people living in extreme poverty is declining globally and in all other regions but increasing in SSA – currently over 400 million (see chart 4).<sup>4</sup>

#### In rural areas ...

Growth of the agricultural sector is known to be poverty-reducing, given the extent of rural poverty and the dependence of smallholders on agricultural incomes. Raising agricultural yields boosts the incomes of millions of smallholder farmers – accounting for about three-quarters of SSA's poor population. It has been assessed that growth generated by agriculture in SSA is more effective in reducing poverty than GDP growth in other sectors, by a factor ranging from just above 1 to 11 depending on sources and samples.



Sources: World Bank, Deutsche Bank Research

For instance, Diao *et al.* (2012) estimate the decline in the national poverty rate resulting from agriculture-led growth to be up to 4 times larger than the decline resulting from non agriculture-led growth: 1.3 for Ethiopia, 1.6 for Nigeria, 3.1 for Rwanda and 4.3 for Kenya.<sup>5</sup> This implies that the industry would have to grow 3 to 4 times faster than agriculture to generate the same poverty reduction at country level. In Ghana, agricultural development was also found to be pro-poor and foster benefits for the economy at large.

#### ... and in urban areas through linkages with the broader economy

The most immediate impact of agricultural growth is in rural communities where higher yields, potentially combined with lower production costs, translate into higher farm incomes and increased consumption of various goods and services. This has spill-over effects at the local, regional and national levels, thus transmitting the benefits of agricultural growth to non-agricultural sectors and the urban population.

In SSA as in the developing world at large, people spend a majority of their income on food, so even non-farm populations depend on agriculture. Higher

<sup>3</sup> Agribusiness for Africa's prosperity. UNIDO (United Nations Industrial Development Organisation). May 2011.

<sup>4</sup> For more on the various facets of growth in SSA, see "Sub-Saharan Africa: A bright spot in spite of key challenges". Schaffnit-Chatterjee. DB Research. July 2013.

<sup>5</sup> Strategies and priorities for African agriculture. Diao, Thurlow, Benin and Fan. IFPRI. 2012. (Cross-country comparisons are often not possible given the differences in how national poverty lines are defined.)

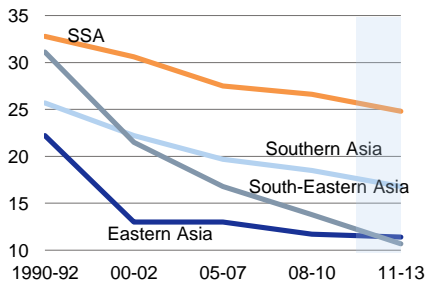


## Agricultural value chains in Sub-Saharan Africa

### Hunger persists in SSA

5

Prevalence of hunger, % population



Sources: FAO, Deutsche Bank Research

agricultural productivity also frees up resources for other sectors and saves foreign exchange if it leads to reduction of agricultural imports.

It is thus unlikely that significant poverty reduction can be achieved in these countries in the absence of agricultural growth. Incomes of both rural and urban households are found to increase as a result of agriculture-led growth. An industry-focused strategy not investing in agriculture is likely to increase inequality.<sup>6</sup>

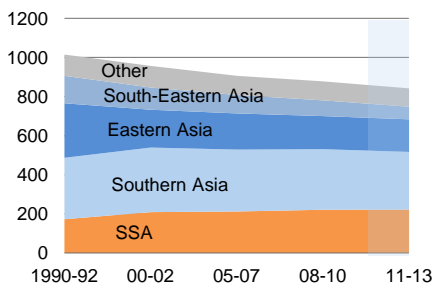
As a key to inclusive growth, agricultural development helps to reduce income inequalities, thus also limiting the risk of social unrest. In a number of SSA countries, populations bypassed by rapid economic growth are experiencing growing frustrations.

### 3. To feed the region

### Fewer hungry globally, not in SSA

6

Number of undernourished, million



Sources: FAO, Deutsche Bank Research

### Reversing undernourishment

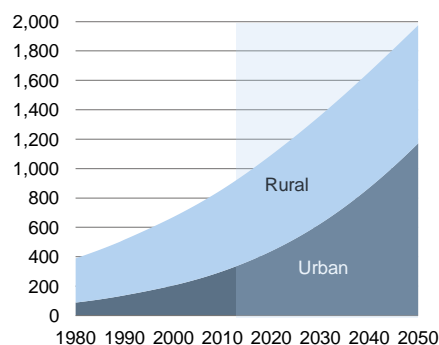
In Sub-Saharan Africa, around 25% of the population is undernourished and this share has declined less than in other regions over the past two decades or so (see chart 5).<sup>7</sup> The number of people affected by hunger is actually increasing in SSA (see chart 6). Based on its current agricultural productivity rates, SSA would meet 25% of its food needs by 2030.<sup>8</sup>

Higher agricultural productivity, especially in food staples and on smallholder farms, translates into higher food security by increasing food availability, thus access through lower prices. This is obviously positive for the urban poor consumers but also for many rural farmers since smallholder households tend to be net food buyers. In any case, if agricultural productivity rises faster than prices fall, farmers are better off, as was the case during East Asia's green revolution.

### More urban

7

SSA population, million



Sources: UN Population Division, Deutsche Bank Research

### Meeting consumers' growing and changing needs

Developing countries are expected to be the leading source of demand growth for agricultural products in the next few decades. In the developing world in general, and particularly in SSA, demand for food is expected to grow significantly in the future and require more resources for three main reasons.

*First, population is increasing faster than in any other region.* Currently estimated at 925 million, SSA's population is forecast to reach 1.2 billion in 2025 and 2 billion in 2050 (see chart 7). By 2050, one in five people in the world will live in SSA, by 2100 one in three – up from one in 7.6 currently – according to forecasts by the UN (Medium-fertility variant).

*Second, incomes are rising steadily* (see chart 8). SSA's average GDP per capita is forecast to increase by around 30% between 2010 and 2030, by 80% between 2030 and 2050.<sup>9</sup> This drives an increase in food demand per capita (see chart 9) but also a diet change away from basic staples and grains as the

<sup>6</sup> This does not exclude other paths to human development and food security in SSA. Depending on their natural resource endowments, labour skills, the trade environment, etc., some countries may move towards manufacturing exports, following the Asian structural transformation path. However, given agriculture's predominant role in the livelihoods of most Africans, irrespective of the path followed, structural transformation in SSA could be accelerated through agricultural growth, key to slashing poverty and hunger.

<sup>7</sup> The State of Food Insecurity in the world. FAO, WFP and IFAD. 2013.

<sup>8</sup> Global Agricultural Productivity Report 2013. Global Harvest Initiative.

<sup>9</sup> Based on GDP forecasts by the African Development Bank and population projections by the UN.



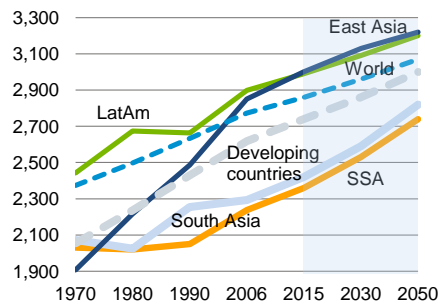
## Agricultural value chains in Sub-Saharan Africa

growing middle class is seeking higher-value foods such as fruits and vegetables, meat and dairy products. The latter require more land and water (and produce more greenhouse gas emissions) than other foods, which will disproportionately increase pressure on resources.<sup>10</sup>

### Per capita consumption on the rise

9

Per capita food consumption, kcal/person/day

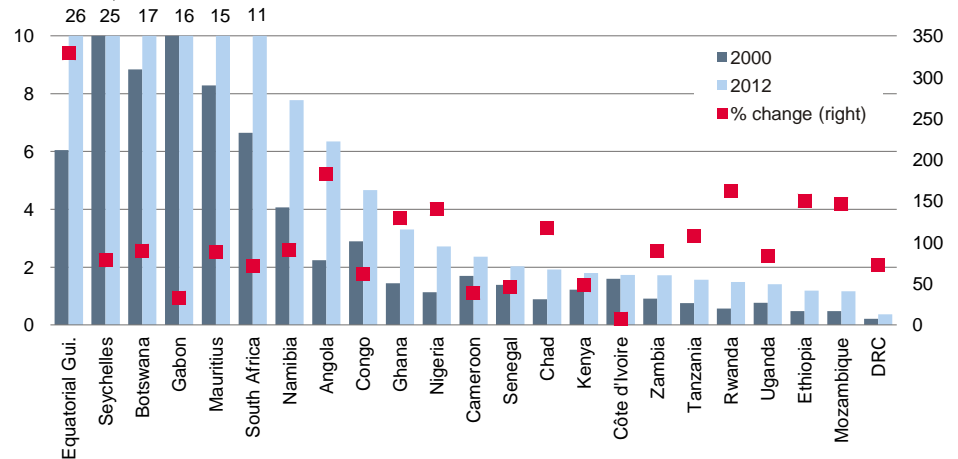


Sources: FAO, Deutsche Bank Research

### GDP per capita in selected countries

8

USD at PPP, thousands



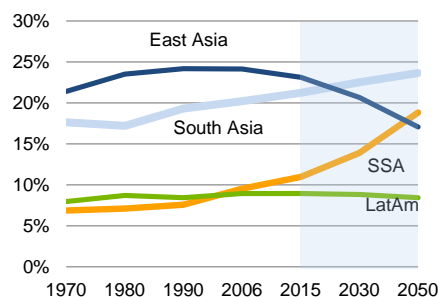
N.B. The bars for countries with highest GDP per capita have been capped in order to make the chart readable

Sources: IMF, Deutsche Bank Research

### SSA: Increasing share of food demand

10

Share of global food consumption



Sources: FAO, Deutsche Bank Research

Over recent decades, many emerging economies of Western Asia, Northern Africa, Latin America and Eastern Asia have seen major changes in the levels and patterns of food consumption. Much of this transition is yet to happen in SSA. Still, there are signs that it is happening, for instance in a growing demand for processed foods (see chart 19) and for fast food: a number of South African and global players have opened hundreds of fast-food restaurants in various SSA countries.

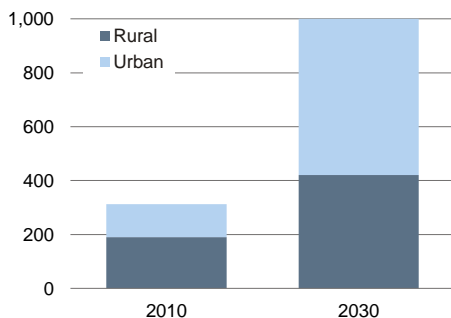
### Urban food markets set to quadruple by 2030

Urbanisation is happening fast, this is the third reason why demand for food will increase. Urbanisation further contributes to changing preferences towards animal proteins and processed foods. Lagos, Nigeria, is among the world's cities with a population above 10 million and is by far the fastest-growing in this group, with a 75% growth rate expected for 2010-2030.<sup>11</sup> Cities are growing faster in Africa than in other regions. Today, around one-third of SSA's population lives in urban areas; by 2035, it may be half (see chart 7).

### Food markets to treble by 2030

11

Value of SSA food markets, USD, billion



Sources: World Bank (2013), Deutsche Bank Research

The fastest growing population and the highest rate of urbanisation in the world, together with a growing middle class, will drive a surge in food demand in SSA (see chart 10).

Most of the increase in food consumption will take place in cities. The World Bank anticipates that urban food markets will increase fourfold by 2030, to exceed USD 500 billion (see chart 11), assuming that the value of food consumption per capita is 25% higher in urban areas than in rural areas.

<sup>10</sup> The global food equation. Schaffnit-Chatterjee. DB Research. September 2009.

<sup>11</sup> The next fastest-growing cities in this group, such as Delhi, Beijing, Dhaka and Shenzhen, have growth rates around 50%.

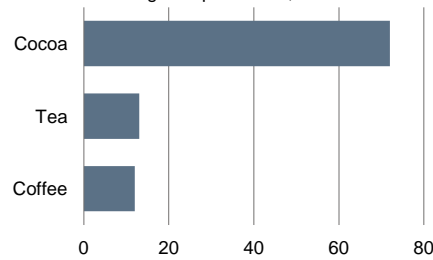


## Agricultural value chains in Sub-Saharan Africa

### Agricultural wealth

12

Africa's share of global production, %



Sources: FAO, Deutsche Bank Research

### 4. To feed the world

World food production may need to increase until 2050 by 70% compared to levels in 2005 in order to feed the growing population. Africa could be an important part of the solution.

#### Larger agricultural potential than other regions

Agricultural productivity in the developed world may be reaching a ceiling as some argue. Agriculture production grew globally at 2.5% per year on average over 2001-09, at 0.6% in the developed world, 3.3% in developing countries and 2.7% in SSA. For the major crops, especially rice and wheat, global yield growth has sharply slowed in most countries since the 1980s as a result of exhaustion of the Green Revolution technology, a slowdown in R&D spending in many countries, increasing land degradation and water scarcity. There is much untapped potential in SSA which suffers from low productivity of land and agricultural labour and enjoys good land and water resources (see Section C on page 14).

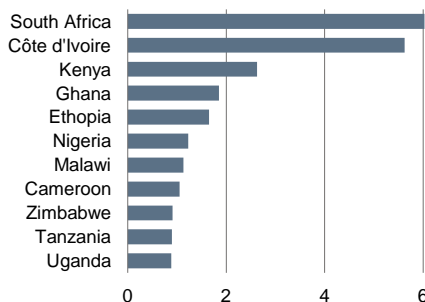
#### Great potential for expanding food and agricultural exports

SSA is already a major producer of several agricultural commodities (see chart 12). Côte d'Ivoire, Ghana and Nigeria account for 64% of global cocoa production, Sudan, Chad and Nigeria for a very high share of the world production of gum arabic.

### Main agricultural exporters

13

USD bn, 2009-2011 average

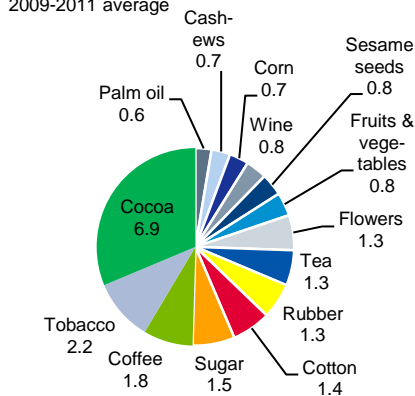


Sources: FAO, Deutsche Bank Research

### SSA: Main agricultural exports

14

Raw and processed, USD bn  
2009-2011 average



These exports making around 65% of all agricultural exports from SSA.

Sources: FAO, Deutsche Bank Research

In terms of exports, South Africa and Côte d'Ivoire top the list with around USD 6 bn, followed by Kenya, Ghana and Ethiopia (see chart 13). A few countries have experienced significant increases in market shares for agricultural exports since 1991, especially Ethiopia and Ghana – also Mozambique and Zambia, although starting from a very low base. Several SSA countries have shares of agricultural exports in total good exports which are among the highest in the world: Ethiopia (91%), Uganda (55%) and Côte d'Ivoire (53%).

SSA's agricultural exports primarily include cash crops (see chart 14). For cocoa and sesame seeds, SSA has the highest share of global exports (60% and 40% respectively). While market shares in sesame, cashews and tea have significantly increased since 1991, they have considerably decreased for coffee (see chart 15). Although starting from a low base, market shares for exports of flowers and fruits/vegetables have also skyrocketed.

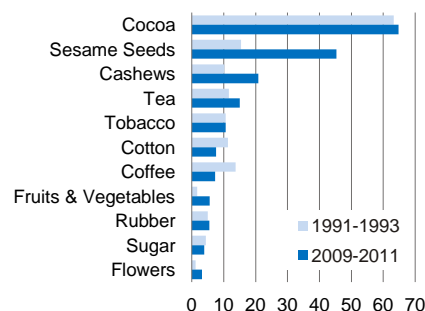
Most of SSA's agricultural exports are commodities with limited global supply since they are grown in areas with specific agro-climatic characteristics.

Moreover, producing and processing these commodities tends to be labour-intensive, which gives African producers an edge given the availability of low-cost labour. According to the World Bank, several SSA countries should be able to emerge as major exporters of rice, corn, soybeans, sugar, palm oil, biofuel and feedstocks.<sup>12</sup>

### SSA's share of world exports

15

Raw commodities, %



Sources: FAO, Deutsche Bank Research

Biofuel initiatives around the world have also driven investments to grow sugarcane, cassava, palm oil, soybeans as well as non-food crops such as jatropha. McKinsey has estimated that the regional biofuel market could reach USD 11 bn by 2030.

<sup>12</sup> Awakening Africa's sleeping giant: Prospects for competitive commercial agriculture in the Guinea Savannah zone and beyond. World Bank. 2009.



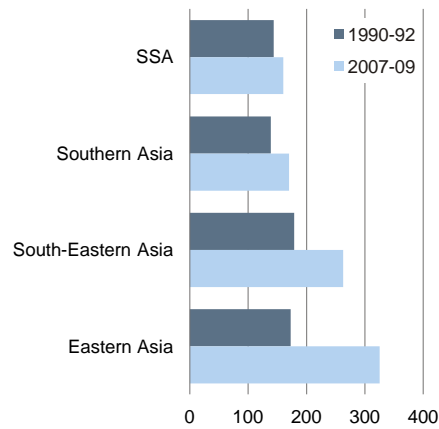


## Agricultural value chains in Sub-Saharan Africa

### Food production stalled in SSA

16

Food production per capita, USD



Sources: FAO, Deutsche Bank Research

## B. Agricultural development lags behind in SSA

In spite of the importance of the sector, agricultural growth in SSA lags behind in many respects.

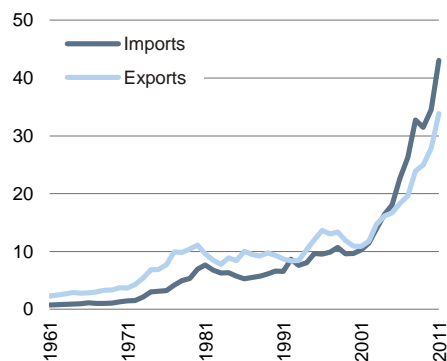
### 1. Robust economic growth leaves the agricultural sector behind

Even in a context of impressive economic growth and positive developments at the macroeconomic and social levels, the agricultural sector in Africa remains under-developed. While overall GDP grew at over 6% annually between 2001 and 2008 in SSA, agricultural GDP grew at 3.4%. Agricultural incomes per capita have grown at less than 1% per year between 2000 and 2009, at 1/3 of the growth rate in the non agricultural sector.<sup>13</sup> And productivity on African farms has not kept pace with population growth, so that food production per capita has not been improving as much as in other regions (see chart 16).

### Growing trade deficit in agriculture

17

Agricultural commodities, USD billion



Sources: FAO, Deutsche Bank Research

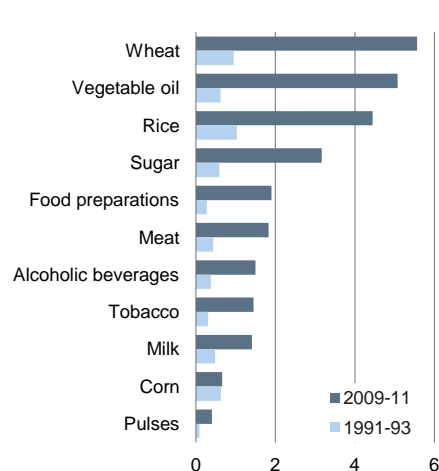
Food availability per capita remains low in SSA, well below the 2500 kcal/person/day threshold. The average supply of protein in SSA was at 58 g/capita/day in 2007-09 vs a developing country average of 72. The gap is even wider for the supply of protein of animal origin (13 vs 24).<sup>14</sup>

In the 1960s and 1970s, many African countries were net exporters of food. In the 2000s, with the pick-up of growth and the mineral commodity boom, SSA became a significant net food importer (see chart 17). Indeed, SSA's market share for imports has increased at the same time as its market share for exports has decreased – contrary to Latin America and Asia which have led global markets for both exports and imports. SSA's share of agricultural exports was 2% in 2009, down from 7.6% in 1970. Although some countries have a strong export orientation (Côte d'Ivoire, South Africa, Kenya), a number of resource-rich countries are large net importers, such as Nigeria, Angola, Sudan and DRC (see chart 18).

### Main imports to SSA

19

USD bn, 2009-2011 average

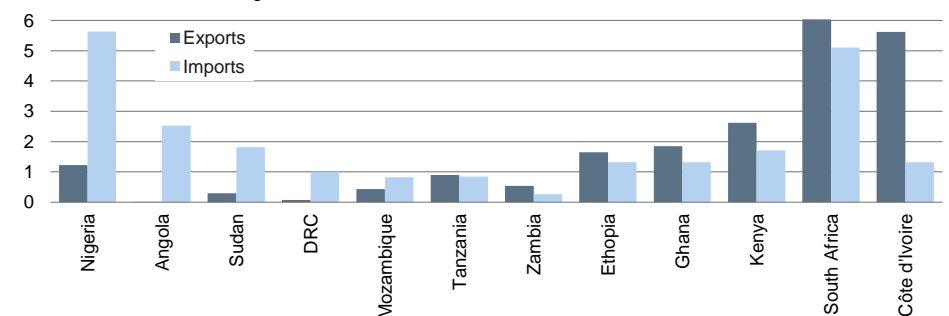


Source: FAO, Deutsche Bank Research

### Agricultural trade for selected countries, from highest to lowest trade deficit

18

USD billion, 2009-2011 average



Sources: FAO, Deutsche Bank Research

In 2011, SSA imported USD 43 bn worth of agricultural commodities, mostly staples which SSA produces itself but in insufficient quantity, in spite of a natural advantage in terms of land and labour – with wheat, a temperate-zone crop,

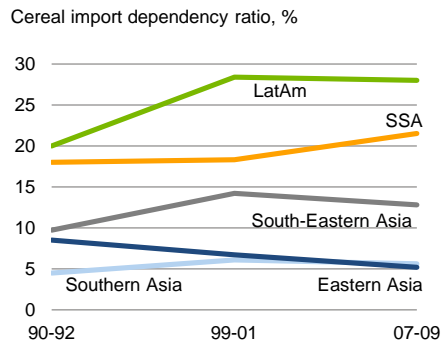
<sup>13</sup> IMF and World Bank data.

<sup>14</sup> Food and Agricultural Organization of the United Nations (FAO).



## Agricultural value chains in Sub-Saharan Africa

### High and increasing import dependency 20



Sources: FAO, Deutsche Bank Research

being an exception. The main imports are wheat, rice, palm oil and sugar, accounting for 40% of total imports in 2011 (see chart 19).

SSA's share of global imports is around 20% for rice and 10% for wheat. SSA needs to import over 20% of its cereal requirements on average (see chart 20) and this share is much higher for some countries. For instance, Angola currently produces only 30% of its needs in grains, according to the National Grains Institute.

The value of food imports over total merchandise exports is relatively high in SSA – at 9% in 2007-09 vs a developing country average of 5%. This indicates a relative vulnerability to global prices through limited ability to generate foreign exchange through exports. During the 2007-08 food crisis when rice and wheat prices reached record highs, several African countries including Nigeria and Senegal experienced riots.

### Growth in food imports 21

#### Staples

Much of the growth in food imports relates to staples, especially wheat and rice. SSA's shares of global food imports have increased for all commodity groups since 1991, except for corn.

#### Animal proteins, sugar, processed foods

Imports of sugar, milk products and meat (particularly poultry) have also risen, as well as food preparations. The latter suggests agribusiness opportunities to develop processing facilities in SSA.

Among merchandise imports, the share of food imports is very high for a number of SSA countries: among the 20 countries in the world with the highest share, 12 are in SSA, including Somalia (55%), Zimbabwe (30%), Senegal (27%) and Sudan (25%).

Sources: FAO, World Bank

## 2. Slow agriculture growth in the global context

Agricultural output growth has accelerated since the 1990s, to 3.1% per year, from 2.3% earlier (see chart 23). However, this has been mostly due to resource expansion, not higher productivity.<sup>15</sup>

### Agricultural productivity measurement 22

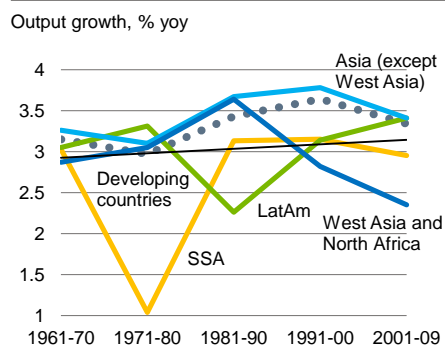
Agricultural productivity is typically measured partially in terms of *output per unit area of land or per person employed*. Some of the highest yields per hectare have been achieved in developed Asia where intensive agriculture – with much labour, capital, fertiliser – has driven total harvest of crop or livestock product per hectare to about 8 times that of the US. In contrast, the highest outputs per worker are in North America where technology allows a farmer to cover more land and produce more per year.

Output can be improved by using more agrochemicals, machinery and energy but they cost money. **Total factor productivity or TFP** takes into account contributions of all conventional inputs and captures *how much is obtained out of a given combination of land, labour, capital and materials*. A rise in TFP reflects technical or managerial innovations allowing to get more with less. Global agricultural output increased threefold between 1961 and 2009 and only about 60% of this improvement can be attributed to the use of *more* land, labour, capital or materials. The rest is due to an improvement in TFP – *more efficient* use of those four items.

N.B. While TFP is a more complete measure of productivity, its measurement requires detailed information on all output and input quantities as well as information on prices and unit costs. While obtaining such data is an onerous task for countries with detailed agricultural data like the US, it is sometimes not even possible for countries in SSA and indirect methods are required to derive approximate measures of TFP.

Source: Fuglie and Rada (2013)

### Agricultural growth: SSA behind 23



Sources: Fuglie (2012), Deutsche Bank Research

### Low yield growth, partially mitigated by expansion of cropland

Agricultural growth can be broken down into various sources according to the scheme displayed in chart 24. Real agricultural GDP grew at over 2% per year over each decade of the period 1961-2000 and accelerated to 3.4% over 2001-2008. This acceleration was entirely a terms-of-trade effect (increase of real agricultural prices)<sup>16</sup> since real output growth slightly fell to 2.95% over 2001-2008 from over 3% from 1981 to 2000.

<sup>15</sup> Productivity data in this section are from Resources, Policies and Agricultural Productivity in SSA. Fuglie, K. and Rada, N. USDA. February 2013.

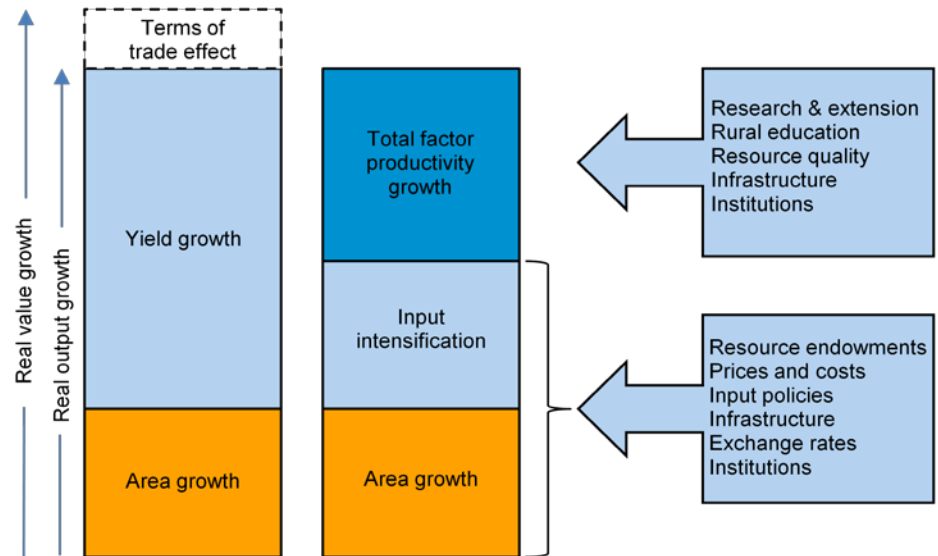
<sup>16</sup> Changes in real GDP include both changes in the volume of output and changes in the terms of trade between agricultural and non-agricultural goods and services since no sector-specific price deflators are available and an economy-wide price index was used.



## Agricultural value chains in Sub-Saharan Africa

### Breaking down sources of agriculture growth

24

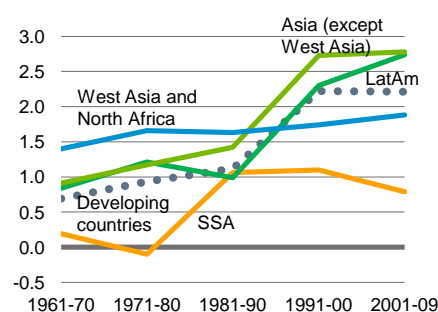


Source: Fuglie and Rada (2013)

### TFP in agriculture: SSA clearly behind

25

Total Factor Productivity, % yoy



Sources: Fuglie (2012), Deutsche Bank Research

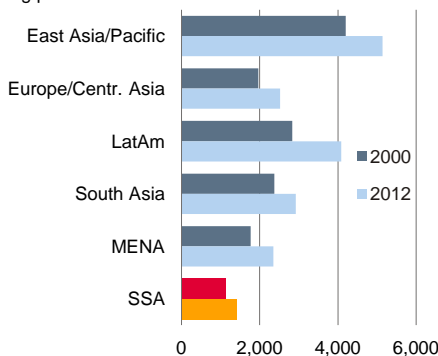
Over 1961-2008, yield growth accounted for around one-third of the 2.5% growth in output, resource expansion for the other two-thirds. TFP growth was responsible for less than one-fourth of output growth over the period. SSA is the only region which has failed to improve agricultural productivity. The productivity of land, labour and capital invested in African agriculture is growing at only around 1% per year since the 1990s. It is an improvement compared to the 1960s and the 1970s (0.2% per year over the period) but it is still half the average for developing countries (see chart 25). This improvement in TFP's growth rate has been partially offset by a declining rate of input intensification.

Thus yield growth in SSA since the 1960s has been the lowest in the world, at less than half in other regions. Yield levels are also often less than half the yields obtained in Asia and Latin America, for both key food crops and cash crops – e.g. cereal yields at 1.4 tonnes per hectare (see chart 26). Tea is an exception and rice yields have recently improved. Cereal yields have increased by 90% in Africa between 1961 and 2011 but by over 200% in Asia and Latin America, according to the FAO.

### Cereal yields: Very low

26

Kg per ha



Sources: World Bank, Deutsche Bank Research

### Zooming in on countries

There are large variations in agricultural productivity across countries, reflecting various factors such as resource endowments, the policy environment and conflicts. Some countries have experienced no significant change in TFP over the past 50 years. This group includes countries in Central Africa except Cameroon, the Horn of Africa, the Sahel and most small island states – although there has been modest improvement in the Horn of Africa (Ethiopia and Sudan) and the Sahel since 1990.

However, a few countries in SSA have experienced sustained modest growth in agricultural TFP between 1985 and 2008. Western Africa comes out with the best productivity performance in recent decades, especially in Ghana, Benin, Niger and Nigeria. Kenya is the country (other than South Africa) which has sustained steady productivity growth since the 1960s. Southern Africa, Malawi and Zambia have experienced TFP growth since the 1980s. Angola showed

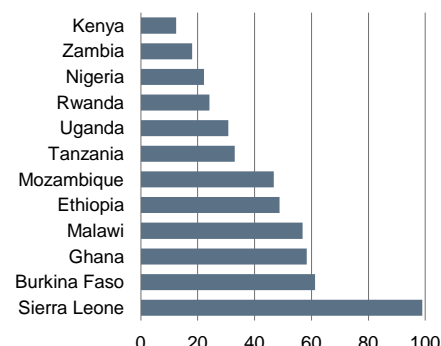


## Agricultural value chains in Sub-Saharan Africa

### Significant land expansion

27

Change in cultivated area, 1990-2011, %



Sources: FAO, Deutsche Bank Research

rapid productivity gains after the civil war in the 1990s – recovering from losses during the war, Mozambique as well to a lesser degree.<sup>17</sup>

Conversely, some countries, like Côte d'Ivoire and Zimbabwe, appeared to be on a sustained growth path before experiencing stagnation or a decline of TFP growth respectively after 2000 and 1997, due to civil unrest or macroeconomic mismanagement.

Cultivated land has expanded at various paces: the area under annual or perennial crops has increased by at least 50% in many countries between 1990 and 2011 (see chart 27), by 100% in Sierra Leone and over 200% in Mali.

### Diversified agriculture in SSA

28

**Crop production** accounts for about three-quarters of agricultural output – livestock products the other quarter – and **food crops** constitute the bulk of crop output. The share of agricultural resources devoted to food production has actually risen over time: by the 2000s, 88% of harvested cropland in SSA was for food crops. The land share allocated to export-oriented cash crops like cotton, sugar, cocoa, and coffee declined from 16.5% in the 1960s to 12.2% in the 2000s.

**African agriculture is very diversified.** Cereals make up less than 20% of agricultural value in West and Central Africa, with the rest coming from roots and tubers (potatoes, cassava, yams, etc.), fruits and vegetables, export crops and livestock. No single crop dominates among cereals in Africa (unlike rice and wheat in Asia) and four of them are important: corn is followed by sorghum, millet and rice.

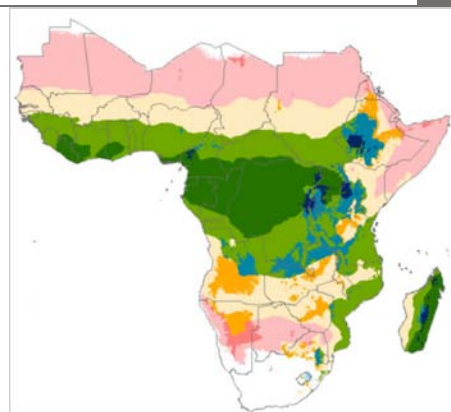
Corn is the most important food staple in Eastern and Southern Africa, and the most widely traded agricultural commodity. In West Africa, there are 3 major agro-ecological zones (see map 29\*) with different production and consumption of food staples. In the Sahelian zone, millet is the principal cereal cultivated and consumed – with exceptions, e.g. Senegal where rice is most important. In the Sudanese zone, corn and sorghum are the principal cereals consumed, followed by rice, cassava and yam. In the coastal zone (with two rainy seasons), yam and corn are the most important food products, supplemented by cowpea.

\*HarvestChoice, 2011. "AEZ Tropical (8-class)." International Food Policy Research Institute, Washington, DC., and University of Minnesota, St. Paul, MN. Available online at <http://harvestchoice.org/node/4997>.

Sources: FAO, World Bank

### A large diversity of agro-ecological climates

29



Source: HarvestChoice/International Food Policy Research Institute and University of Minnesota, 2011.

## 3. A number of factors constrain yield growth

The very low level of yields in SSA is due to various reasons, especially poor irrigation, low fertiliser use, infrastructure constraints, insecure land tenure<sup>18</sup>, unfavourable price policies and weak agricultural research. Neglect is at the core of this situation: many African governments opting for industry-based growth strategies drove a drastic reduction in investments in agriculture. Other underlying reasons include misguided policies and weak institutions, crop failure due to droughts and floods, conflicts and HIV. While most of these factors are being tackled, climate change will remain a challenge and Africa is expected to remain more affected than any other region.

Soil depletion is also a factor. Lacking adequate inputs and facing population pressure, African farmers have expanded cultivation onto fragile land, increasing erosion from wind and rain. Failing to leave the land fallow and expanding the range of crops grown also prevented it from regaining fertility.

Beyond yield levels, SSA also experiences a high level of post-harvest losses. They have been estimated at around 15-20% for cereals, higher for perishable products.<sup>19</sup>

<sup>17</sup> Resources, Policies and Agricultural Productivity in SSA. Fuglie, K. and Rada, N. USDA. February 2013.

<sup>18</sup> For a discussion on land tenure, see Foreign investment in farmland. Schaffnit-Chatterjee, DB Research. September 2009.

<sup>19</sup> Missing food: The case of post-harvest grain losses in SSA. World Bank, FAO, Natural Resources Institute. 2011.



## Agricultural value chains in Sub-Saharan Africa

### Main agricultural items for selected countries

30

Total value of agricultural exports, imports and production and share of total for main items

Average 2009-2011, current USD for exports/imports, International Dollars for production

	ETHIOPIA	KENYA	TANZANIA	ZAMBIA
<b>Exports</b>	Total: 1.6 bn	Total: 2.6 bn	Total: 0.9 bn	Total: 0.5 bn
	Coffee (38%)	Tea (37%)	Coffee (13%)	Sugar, raw (23%)
	Sesame seeds (20%)	Flowers (23%)	Tobacco (12%)	Tobacco (19%)
	Vegetables (13%)	Coffee (8%)	Cashews (10%)	Corn (15%)
<b>Imports</b>	Total: 1.3 bn	Total: 1.7 bn	Total: 0.8 bn	Total: 0.3 bn
	Wheat (40%)	Palm oil (19%)	Wheat (36%)	Palm oil (23%)
	Palm oil (19%)	Wheat (17%)	Palm oil (22%)	Food preparation (8%)
	Sugar (7%), Sorghum (6%)	Corn (12%)	Sugar, refined (9%)	Soybean oil (5%)
<b>Production</b>	Total: 9.9 bn	Total: 7.3 bn	Total: 7.6 bn	Total: 1.6 bn
	Meat (11%)	Meat (17%)	Bananas (11%)	Corn (23%)
	Milk (11%)	Milk (16%)	Meat (9%)	Meat (12%)
	Roots/tubers (8%)	Corn (6%)	Corn (8%), Rice (8%)	Cassava (8%), Sugar (7%)
	<b>MOZAMBIQUE</b>	<b>NIGERIA</b>	<b>GHANA</b>	<b>CÔTE D'IVOIRE</b>
<b>Exports</b>	Total: 0.4 bn	Total: 1.2 bn	Total: 1.8 bn	Total: 5.6 bn
	Tobacco (39%)	Cocoa beans (56%)	Cocoa beans (75%)	Cocoa beans (48%)
	Sugar, raw (20%)	Rubber (12%)	Cocoa butter (6%)	Rubber (13%)
	Sesame seed (8%)	Sesame seeds (10%)	Sugar, refined (4%)	Cocoa paste (10%)
<b>Imports</b>	Total: 0.8 bn	Total: 5.6 bn	Total: 1.3 bn	Total: 1.3 bn
	Rice (22%)	Wheat (20%)	Rice (21%)	Rice (43%)
	Wheat (14%)	Palm oil (17%)	Sugar, refined (14%)	Wheat (12%)
	Palm oil (7%)	Rice (17%)	Wheat (10%), Palm oil (9%)	Tobacco (7%)
<b>Production</b>	Total: 2.9 bn	Total: 34.5 bn	Total: 6.6 bn	Total: 5.9 bn
	Cassava (31%)	Yams (25%)	Yams (23%)	Cocoa beans (24%)
	Corn (10%)	Cassava (13%)	Cassava (21%)	Yams (23%)
	Meat (5%)	Citrus fruits (5%)	Cocoa beans (11%)	Cashews (6%), Plantains (5%)

Sources: FAO, Deutsche Bank Research

## 4. Beyond agricultural production: Value chains are underdeveloped

### Major value chain constraints

31

- Output markets: price risk, lack of regional integration, quality issues, policies distorting markets, food safety, social and environmental issues

- Inputs and technology: access issues (land, water), policies distorting markets

- Infrastructure issues: transport, irrigation, energy, etc.

- Access to finance

- Inadequate skills

- Issues with engaging smallholders

Source: World Bank

In most of SSA, the size of the agribusiness sector is relatively small compared to that of farming. The ratio of value added in agribusiness to that of farming is typically 0.6 for these countries, compared to 13 in the US.<sup>20</sup>

Although many SSA economies have undergone structural change with a decline of agriculture's share of GDP, this has not been accompanied, in most cases, by the emergence of a diversified manufacturing sector: the major part of the (relatively modest) increase in industry's share of manufacturing was accounted for by the extractive industries (while the service sector expanded rapidly).

Many least developed and landlocked countries – such as Ethiopia, Malawi, Burundi – continue to depend on the export of agricultural commodities – goods with very little or no processing involved accounting for 75% of exports. However, some countries have succeeded in reaching an export share of at least 30% for processed agricultural products. This is the case for Zambia,

<sup>20</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.

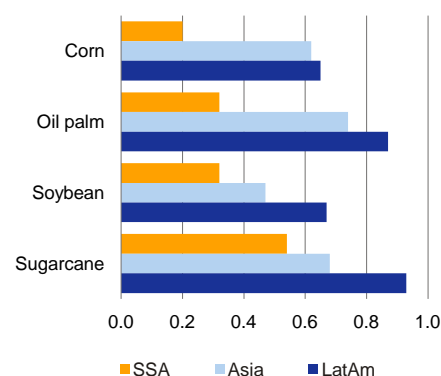


## Agricultural value chains in Sub-Saharan Africa

### Low yields in SSA

32

Current yield relative to potential yield

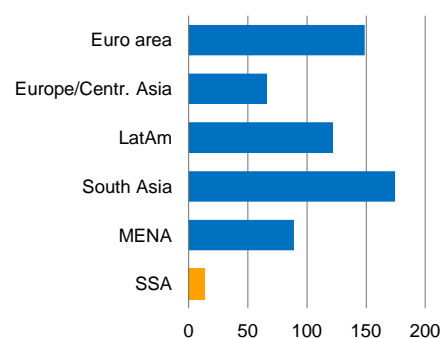


Sources: World Bank, Deutsche Bank Research

### Very low fertiliser usage

33

Kg fertiliser per hectare of arable land, 2009-2011

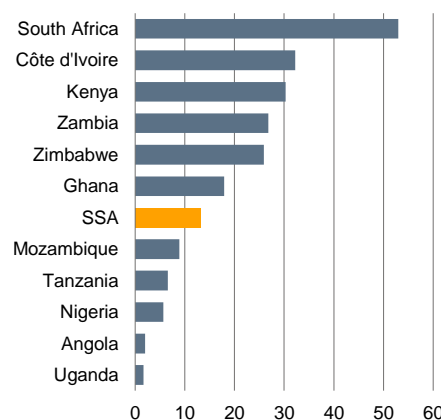


Sources: World Bank, Deutsche Bank Research

### Uneven fertiliser use across countries

34

Kg fertiliser per hectare of arable land, 2009-2011



Sources: World Bank, Deutsche Bank Research

South Africa, Kenya, Côte d'Ivoire, Tanzania and Ghana in descending order of level of processing.<sup>21</sup>

Agricultural value chains in SSA are mostly made up of micro, small and medium-sized enterprises. A key challenge is the involvement of small farmers in the value chain.

## C. The agricultural potential in SSA is huge

Agriculture has huge potential in SSA for several reasons. The map on page 16 illustrates some key aspects of this potential.

### 1. Large scope for improvement in inputs to boost yields

Yields remain way below potential in SSA, with corn yields at no more than 20% of potential (see chart 32). Given the low usage of quality inputs and cultivation methods, there is large scope to increase yields, even using low-cost and existing technologies. Low use of farm inputs is prevalent in SSA and particularly limiting, especially in a context of chronic soil depletion.

Averaging 13 kg per hectare, the use of fertilisers is well below that of other regions, comparing to 73 kg in MENA, for instance (see chart 33). In fact, the total amount of nutrients added to cropland from fertilisers, manure and other sources is estimated to be below the amount removed in the crop harvest. As a result, continuous cropping cannot be sustained as long fallow periods are required to allow a recovery of soil nutrients.<sup>22</sup>

Fertiliser consumption is very uneven across countries in SSA (see chart 34). The application rates fell drastically in some countries after subsidies were removed, as in Nigeria in the early 1990s. Elsewhere, fertiliser use has gradually increased. In Kenya, it has averaged around 35 kg/ha since the mid-1990s.

Overall, small increases in fertiliser use in SSA, whether nitrogen, phosphorus or potassium or organic fertilisers like manure and compost, can produce dramatic improvements in yields. Responsive crop varieties are also lacking and greater use of improved seeds could bring major benefits.

### 2. Around 50% of land available globally

SSA has vast amounts of uncultivated arable land: 200 million hectares, close to half of global availability (see chart 35). This means that in Africa, unlike many other parts of the world, there is room for agriculture to expand. The African countries with the most significant amounts of uncultivated cropland are displayed in chart 36.

Bringing additional land into production can be challenging. These areas tend to have very low population densities but some of them are located hours away from the next city and will need major infrastructure development to have easy access to markets. In some cases, the environmental cost can be high.

Most importantly, property usage rights are often unclear. There is growing foreign interest in the untapped potential of Africa's fertile land (and water availability). Two-thirds of the global farmland area of interest to foreign

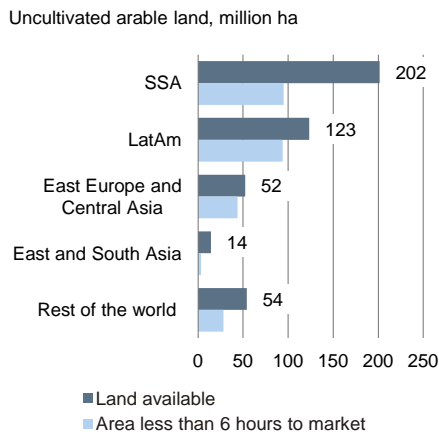
<sup>21</sup> Agribusiness for Africa's prosperity. UNIDO. May 2011.

<sup>22</sup> Resources, Policies and Agricultural Productivity in SSA. Fuglie, K. and Rada, N. USDA. February 2013.



## Agricultural value chains in Sub-Saharan Africa

### SSA: Significant land potential 35



Sources: World Bank, Deutsche Bank Research

investors is located in Africa – mostly in Sudan, South Sudan, Mozambique, Tanzania, Ethiopia, Madagascar, Liberia, DRC and Zambia. Rights to land and natural resources need to be recognised, clearly defined and enforced. In the meantime, investors and governments have to screen investments for responsible practices, in order to maximise opportunities and minimise risks – economic, social and environmental. Arrangements with existing land users (see D1 on page 17), to enhance their productivity without transfer of land, is usually the most efficient way to invest.<sup>23</sup>

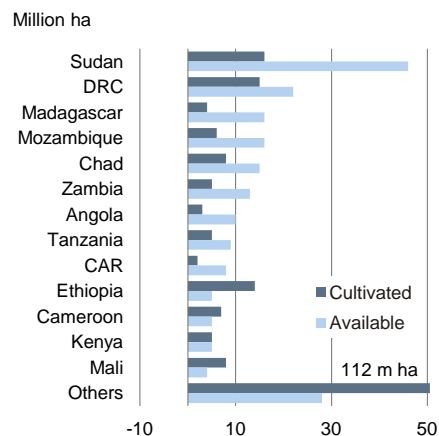
### 3. Untapped water resources, with less than 5% of cultivated land currently irrigated

Although renewable water resources are unevenly distributed within SSA (with more in Central Africa), SSA hosts 13 major transboundary water basins. It uses only about 3% of its renewable water resources for irrigation (world average: 5%). These untapped water resources can help ensure water security including irrigation.

Irrigation presently covers around 9 million hectares of the 200 million hectares of cultivated land in SSA, less than 5% – by far the lowest in the world, compared with 44% in Asia. Irrigation is taking place mostly in Sudan, South Africa and Madagascar, accounting for two-thirds of the irrigated area. There is huge potential to improve yields through water management.<sup>24</sup>

A recent study identified that better crop irrigation through investments in motorised pumps could generate net revenues up to USD 22 bn per year by benefiting 185 million people in SSA.<sup>25</sup>

### Large land resources available 36



Sources: World Bank, Deutsche Bank Research

### 4. Agricultural output potentially doubling by 2020

As a result of the factors above, African agricultural output could almost double by 2020, reaching USD 500 bn in 2020 (40% of the region's GDP) and USD 880 bn in 2030, from USD 280 bn in 2010 according to estimates by McKinsey.<sup>26</sup> Coastal countries with large areas of uncultivated land account for around 70% of this growth potential. These are Angola, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Mozambique, Nigeria, Sudan and Tanzania.

These forecasts assume that adequate levels of investments and political support are available and enable: 1) a rate of growth in cultivated land up to 0.5 million ha per year (half the expansion taking place in Brazil between 1987 and 1996) in most conducive countries, 2) yield growths reaching between 75% and 100% of developed agricultures in Africa (South Africa and Egypt) in countries which are not water-stressed, and 3) a shift to high-value crops with 20% of cereal land converted to horticulture and revenues per hectare increasing five-fold.

<sup>23</sup> Foreign investment in farmland. Schaffnit-Chatterjee. DB Research. September 2009.

<sup>24</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.

<sup>25</sup> Water for wealth and food security. Synthesis report of the AgWater Solutions project. 2013.

<sup>26</sup> Lions on the move. McKinsey Global Institute. November 2012.

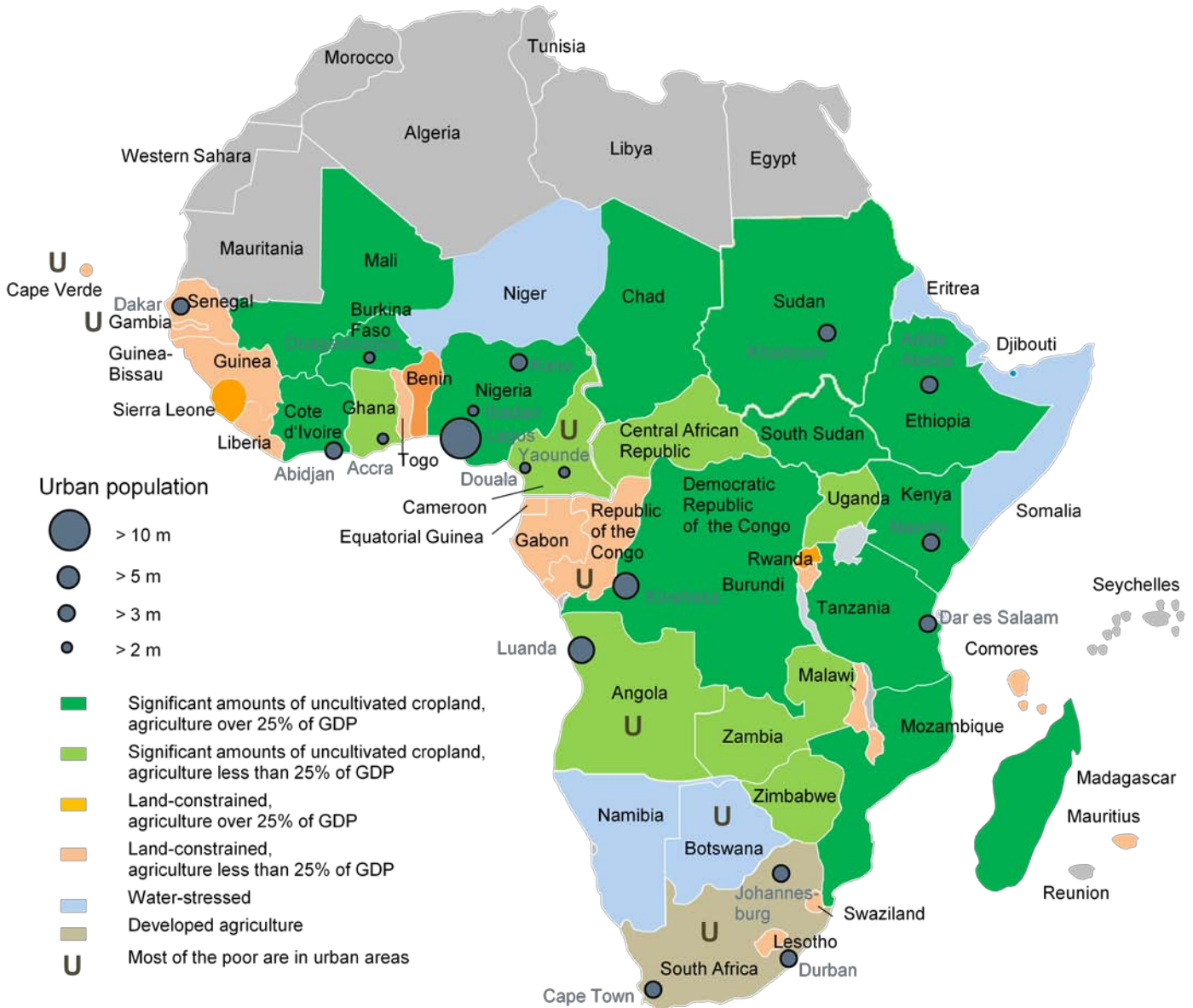


## Agricultural value chains in Sub-Saharan Africa

Agricultural potential

37

Land, water, agriculture



Sources: FAO, World Bank, Deutsche Bank Research

### 5. Impacts along the whole food value chain

Higher agricultural output implies an increased demand for upstream products such as fertilisers, seeds, pesticides and machinery. Downstream activities would also grow, e.g. grain refining and other types of food processing, particularly of vegetable and fruit. Indeed, demand is growing fast, not only for raw produce but also for higher-end food products.

Factoring in higher upstream demand and downstream activities, the increase in agricultural output could translate into an additional USD 275 bn in revenues by 2030 (to the USD 880 bn mentioned above) according to McKinsey. The World Bank forecasts that farmers and agribusiness in SSA could create a USD 1 tr industry by 2030.<sup>27</sup>

<sup>27</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.





## D. Unlocking SSA's agricultural potential

Helping smallholder farming to grow is essential to agricultural development in SSA for several reasons: small farms are predominant currently, and expected to stay so in the mid-term, and they can be quite efficient.

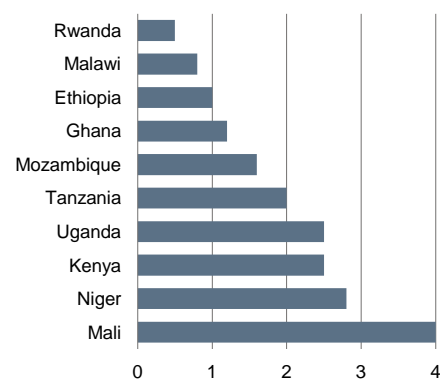
### 1. Developing smallholder agriculture is crucial

#### Small farms are predominant in SSA ...

#### Farms are small

38

Average size of agricultural land per household, ha, 2008



Sources: AGRA, AfdB, Deutsche Bank Research

Smallholder farming accounts for 80% of all farms and most of the land cultivated in SSA. These 50 million small farms produce the majority of agricultural goods and contribute in some countries to 90% of production. More than 75% of agricultural outputs in Kenya, Tanzania, Ethiopia and Uganda are produced by smallholder farmers.<sup>28</sup> Some countries, such as Zambia, Mozambique, Kenya, Rwanda and Nigeria, have a relatively large number of commercial farms with some very large corporate farms in addition to a majority of small farms.

Farms are very small, on average, in most of SSA (see chart 38 for selected countries). In West Africa, sizes tend to be slightly bigger but households as well.<sup>29</sup>

The process of increasing the size of these small farms is slow, and various countries are experiencing a decrease in farm size. This is due to several reasons such as insufficient growth in urban jobs, inheritance systems that lead to sub-division of farms, land right systems that limit opportunities for consolidation, etc.<sup>30</sup>

Given that small farms are here to stay for quite some time still, agricultural growth must include their transition to commercial farming. Agricultural growth that includes smallholders boosts food availability and incomes, and thus generates demand for locally produced goods and services, resulting in broad-based socio-economic development in rural communities.

#### Boosting yields while improving human development

39

Not all types of agricultural growth are equally effective at tackling food security and human development. It is not only important to boost agricultural productivity but also how yields are increased. Although cash crops do generate income and tend to have higher value, productivity increase is particularly important for cereals and starchy roots since they provide two-thirds of total energy intake, up to three-quarters for the poor.

For instance in South Africa, cereal yields in 2008-2010 were 3.75 times higher than in 1961-1963. This drastic yield growth was driven by large-scale capital-intensive corn cultivation, in a policy environment focused on the needs of white farmers. These policies did not result in increases in employment, income or purchasing power and did little to improve food security for the rural poor.

Source: Africa Human Development Report 2012, UNDP

#### ... and efficient in terms of total factor productivity

Even if larger farms are usually considered more efficient in terms of land or crop productivity, small farms can be very efficient in terms of total factor productivity – including labour and capital. Lower yields do not necessarily translate into lower efficiency since their costs tend to be lower than those of large farms. In addition, scale economies may be achieved by mechanisation in crops such as sugarcane, cereals and soybeans but perennial crops such as rubber, fruit and vegetables tend to do better under intensive production with a significant proportion of manual input. The reality of geography/topology (e.g. mountainous areas) and climate may also hinder economies of scale in some parts of Sub-Saharan Africa.

Investing in large mechanised farms can however help achieve food security in countries with sparsely populated cultivable land, especially if migration to these areas is limited and if the non-agricultural sector can absorb the growing labour force. In areas where the terrain and socio-political structure are conducive to

<sup>28</sup> Smallholder agriculture in East Africa. African Development Bank. 2010.

<sup>29</sup> Africa agriculture status report. Alliance for a Green Revolution in Africa (AGRA). 2013.

<sup>30</sup> "Is small farm led development still a relevant strategy for Africa and Asia?" presentation. Peter Hazell. Oxford University. March 2013.



## Agricultural value chains in Sub-Saharan Africa

larger farms, these too can contribute to greater development, as long as related investments are transparent and responsible, and if strong links are forged with the smallholder sector.

Given the large diversity of contexts in terms of agro-ecology, markets and business environments, each country will need to find its own path in terms of farm size distribution and farming systems.

### From subsistence farming to commercial farming

#### Making agricultural growth inclusive through partnerships between smallholders and agribusiness players

40

These models exploit the complementary character of each party's assets: land, labour and local knowledge for smallholders vs capital, technology and markets for investors.

**Contract farming** is an agreement between a processor or buyer and farmers (individually or in groups) that guarantees a market and/or price for a product of specified quality. The contractor usually provides inputs and advisory services.

These contracts are used widely in sugarcane, palm oil, dairy, poultry and export horticulture – recently for grains. Most evaluations indicate positive benefits for smallholders.

**Outgrower schemes** are agreements where investors finance crop establishment up front and agree to process the product, but these arrangements may or may not involve contracts for input supply and technical assistance.

Source: World Bank (Growing Africa)

If agricultural growth is to reap benefits in terms of food security and human development, it has to happen in a labour-intensive way on small farms. In order to thrive, smallholders need access to the basics: 1) Land and inputs (water, fertiliser, quality seeds), 2) Knowledge, 3) Functioning markets (requiring adequate infrastructure and market information), 4) Affordable credit and 5) Risk management mechanisms. All are important since inability to get one often translates into sub-optimal outcome or failure. Accessing these basics presents a challenge to most of SSA's smallholders.

There is a full range of business models supporting smallholder farmers and linking them to buyers and consumers, such as contract farming or outgrower schemes. Small farmers – possibly organised as a cooperative – and large investors can form mutually advantageous partnerships and large-scale investment does not necessarily have to result in the conversion from small-scale agriculture to large-scale agriculture.

Such models can also present risks if the interests of both parties are not aligned. Governments and donors sometimes reduce start-up risks to investors by co-financing initial investment costs for smallholders. Strong producer organisations or governments can also mitigate the risk that farmers' interests are not adequately taken into account by making sure that adequate information is available (e.g. market prices), providing an informal dispute mechanism, etc.<sup>31</sup>

## 2. Broader, more sustainable input use and irrigation

Low, inconsistent use of agricultural inputs is a crucial reason for low yields in SSA. Low fertiliser use undermines not only the upcoming crop but also future ones since soil nutrients are continually mined.

Improving farmers' incentives to use adequate amounts of fertilisers is key (see chart 33). In order to be effective, this has to go hand in hand with appropriate water management since faulty drainage leads to fertiliser washing away and applying fertiliser without adequate water amounts burns crops. The latter is of particular concern in a region where close to 75% of the surface area is dry land or desert. Climate change exacerbates the problem in a region highly vulnerable to drought and floods. Plant varieties also need to be adapted to prevent fertilised plants from developing stalk at the expense of grain, thus toppling over and being destroyed, as was the case in India for wheat and rice before high-yield plant varieties were developed.<sup>32</sup>

Increasing the use of farm inputs has to be done sustainably. Excessive use of fertiliser during the Green Revolution in India and China led to soil depletion and drinking water contamination. This issue has acquired a new dimension with climate change. Agriculture is a heavy emitter of greenhouse gases (14% of all GHG emissions are attributed to agriculture production, 25% if agriculture-driven

<sup>31</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.

<sup>32</sup> Africa Human Development Report 2012, UNDP.

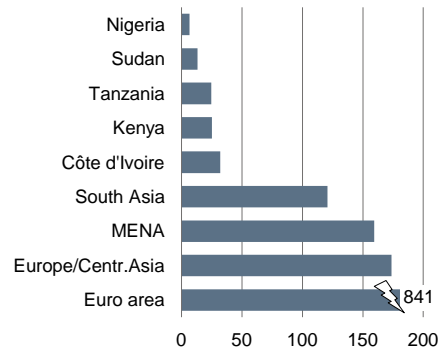


## Agricultural value chains in Sub-Saharan Africa

### Very few tractors

41

Tractors per 100 km<sup>2</sup> of arable land



Sources: FAO, Deutsche Bank Research

deforestation is included<sup>33</sup>). The main sources of agricultural GHGs are emissions of nitrous oxide from soil, mostly through fertiliser use and manure being transformed by soil bacteria.

A particular challenge in SSA, dominated by fragile ecosystems, is to improve irrigation and fertiliser use without harming soils. Incentives for fertiliser use need to be designed to avoid leakages and distortions. Often linked to production, subsidies and pricing policies of agricultural inputs usually lead to overuse of pesticides, fertilisers, water and fuel or encourage land degradation.

### Better farming methods

Changing the incentive structure can be achieved by increasing the efficiency of the use of agro-chemicals and promoting their replacement by agricultural practices which enrich the soil, reduce emissions and lower both agricultural production costs and import bills (e.g. multi-cropping, crop-livestock integrated production, use of bio-fertilisers and bio-pesticides, agroforestry).<sup>34</sup>

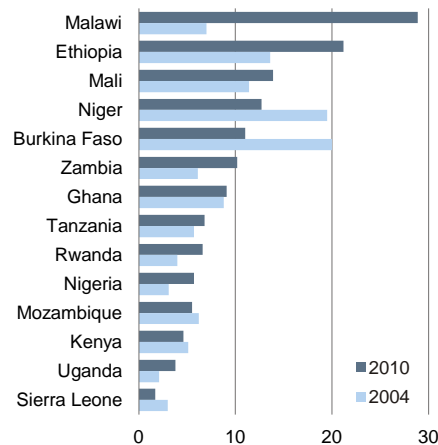
Small-scale farmers in developing countries often do not have stable land tenure and this is not conducive to investing in soil fertility and other sustainable agricultural practices.<sup>35</sup>

Use of machinery is also very low in SSA (see chart 41). However, simple techniques are sometimes particularly appropriate for smallholders. As an example, "micro-dosing" – applying one bottle cap's worth of chemical fertiliser – is cost-effective and avoids excessive use damaging soils.<sup>36</sup>

### Relatively little spent on agriculture

42

Share of agricultural expenditure in total government expenditure, %



Sources: IFPRI, Deutsche Bank Research

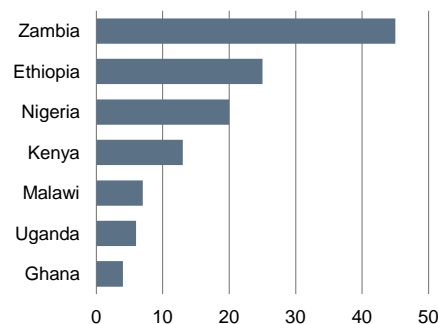
## 3. Political commitment and public investment

In 2003, African heads of state pledged to allocate at least 10% of their national budgets to agriculture through the Comprehensive Africa Agriculture Development Programme (CAADP) and the Maputo Declaration. They also committed to achieving at least 6% annual agricultural growth. This has successfully guided actions to stimulate economic growth and reduce hunger and poverty through increased investment in agriculture even though Africa as a whole has not met the CAADP targets.

### Agricultural expenditure per capita

43

Ratio of public expenditure on agriculture to rural population, USD per capita



Sources: IFPRI, FAO, Deutsche Bank Research

Agricultural spending has grown steadily (on average by 7.4% annually between 2003 and 2010) and quite a few countries are now meeting or surpassing the budget target<sup>37</sup> (see chart 42). However, some countries still spend less than 5% of their national expenditure on agriculture, e.g. Sierra Leone and Uganda. In comparison, Asian governments during the Green Revolution spent more than 20% of their budgets on agriculture and the EU's Common Agricultural Policy amounts to around 40% of the total EU budget. Ethiopia is one of the countries with the highest public expenditure on agriculture, both as a share of total public expenditure and per capita of rural population (see chart 43).

<sup>33</sup> Intergovernmental Panel on Climate Change.

<sup>34</sup> For more on this, see Mitigating climate change through agriculture. Schaffnit-Chatterjee. DB Research. September 2011.

<sup>35</sup> This is an important issue further discussed in Foreign investment in farmland. Schaffnit-Chatterjee. DB Research. September 2013.

<sup>36</sup> Sustainable intensification: A new paradigm for African agriculture. The Montpellier Panel 2013.

<sup>37</sup> ReSAKSS Annual Trends and Outlook Report 2012: Complying with the Maputo Declaration Target. S. Benin and B. Yu. International Food Policy Research Institute. 2013.



## Agricultural value chains in Sub-Saharan Africa

The agricultural growth rate improved to 3.8% per year on average – still well below the 6% target. A few countries have exceeded the growth target since 2003: Angola, Ethiopia, Guinea, Mozambique, Nigeria and Rwanda.<sup>38</sup>

African governments have a key role to play all along the agricultural value chain since erratic government interventions are recognised as a constraint.<sup>39</sup>

### 4. Closing the infrastructure gap

#### Several irrigation models, with different degrees of private-sector involvement

44

- Under the Utility Model, the public sector invests in and owns the irrigation infrastructure but outsources the operation and maintenance to the private sector.

- Under another model, public investment is used to develop irrigated land which is leased to large farm companies which pay operation and maintenance costs for the entire irrigation system (including irrigation provided to smallholders) and agree to support the access of neighbouring small producers to technology and markets.

- Under other models, the private sector makes the main infrastructure investment and the public sector provides an enabling environment including the facilitation of large-scale financing and secure and tradable land tenure and water rights.

Water availability, quality and cost will be an increasingly important factor in the location and profitability of farming and agro-industry. Current pricing structures for water often encourage its overuse, undermining long-term sustainability of water-intensive farmland and agro-processing.

Source: World Bank (2013)

Lacking infrastructure is a well-known constraint to any operation in SSA, particularly agriculture.

#### Infrastructure investments for irrigation, roads, markets, etc. ...

Infrastructure is crucial to increasing agricultural productivity and expanding agribusiness in SSA, along many dimensions: water management, power, access to markets for both agricultural inputs and outputs including sturdy roads, storage, processing facilities, telecommunications for access to market information, etc.

The lack of meaningful market outlets prevents too many African subsistence farmers from embracing commercial farming. Long transportation times to the nearest town often translate into high transportation costs and post-harvest losses, especially during rainy seasons. Transit delays have a significant effect on exports. A one-day reduction in inland travel times has been estimated to lead to a 7% increase in exports.<sup>40</sup> Over one-third of SSA's rural population lives five hours from the nearest town of 5000 people. The World Bank estimated that, including maintenance, it would cost around USD 110 bn to provide 75% of the rural population in Africa with access to an all-season road within 2 km.

#### ... often require public investment in partnership with the private sector

If current investment rates persist, irrigated area is expected to expand only at around 1% annually, according to the FAO. Given the role of irrigation as a productive input, the private sector has a natural role in investing in irrigation.

The public sector has a role in regulating the sustainable use of a critical and limited resource. Given the high levels of the initial costs and risks involved, particularly in the absence of clear land rights, it makes sense to share them.

Similarly, the public good feature of roads and market infrastructures means that public-private partnerships can advantageously fill the gaps, provided that African governments create incentives for private investments.

### 5. Technology and human capital

Agricultural research for SSA has to address a wide range of conditions such as diverse ecologies, frequent droughts, poor soil fertility and various types of pests and diseases. It is essential to develop high-yield varieties which are nutritious and resilient and to use cropping methods which are smallholder friendly and

#### Replacing obsolete curricula

45

Despite favourable conditions for floriculture in East Africa, companies in Uganda and Ethiopia lack well-trained middle managers and technical workers. At the request of the growers' associations, experts from the Netherlands worked with African academic institutions to provide short-term training in specific skills to farm supervisors and assistant managers of various departments, including skills in greenhouse, fertilisation and irrigation, post-harvest handling and pest management.

Programmes that focus on women can be particularly effective in building the next generation of human resources. The African Rural University for Women in Uganda aims to "produce entrepreneurs who are self-motivated and innovative."

Source: World Bank (2013)

<sup>38</sup> World Bank and IFPRI.

<sup>39</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.

<sup>40</sup> What constrains Africa's exports. Freund, C. and Rocha, N. World Bank Economic Review 25(3). 2011.



Africa has traditional areas of food deficit and food surplus.

*Food deficit areas* include drought-prone areas, such as the Horn of Africa and the Sahel. Conflict and civil unrest compound this problem in the Horn, the Congo Basin and pockets of West Africa.

*Food surplus areas* include two types of highly productive agricultural zones:

- 1) Areas with favourable and reliable rainfall that do not get too cold in the winter (suitable for cassava and banana requiring warm conditions) and watersheds,
- 2) The “staple food basket zones”, where flexible climates support the cultivation of different food crops, particularly cereals, alongside year-round drought-resistant crops for domestic consumption.

Examples include (a) Northern Zambia, where cassava production ensures domestic food security, even in drought years, enabling the region to export maize to DRC, Malawi, and elsewhere in Zambia; (b) Eastern Uganda, where bananas and cassava ensure food security, thereby enhancing maize exports to Kenya; (c) Northern Mozambique, where cassava and Irish potato cultivation provide local food, enabling regular maize exports north into Kenya and south into Malawi; (d) most of Tanzania, where a combination of rice, cassava, bananas, and maize enable regular cereal exports north into Kenya and south into Malawi; and (e) South Africa, where large-scale commercialisation and mechanisation combined with modern inputs and irrigation enable high yields for the export of cereals northward to Zimbabwe, Southern Mozambique, and Malawi.

Source: World Bank. Africa can help feed Africa. October 2012

sustainable.<sup>41</sup> In order to best respond to local needs, incorporating local knowledge is greatly beneficial.

A range of skills required in the broad agricultural sector are often lacking in SSA, from practical training to farmers through agricultural extension services to academic education for full-time university students or agribusiness executives. Educating women is particularly important given their critical role in farm households. Women are responsible for 75% of the work involved in food production at large, 90% in food processing. As farmers, mothers, educators and innovators, they are a crucial link between food production, consumption and food security.<sup>42</sup>

Encouraging rural youth to enter agriculture and to provide the training and services for them to succeed as commercial farmers or small and medium-level entrepreneurs is a particular challenge. It is ironic that, given the place of agriculture in SSA economies, only 2% of students major in agriculture.

Building skills and entrepreneurship is slowly taking place with the introduction of new processes and problem-solving approaches. Some African universities have revamped their curricula and partnered with private firms to provide the skills in demand.

## 6. Facilitate trade

Fully exploiting the opportunities in domestic, regional and international markets is essential for SSA to be able to tap its agricultural potential.

### Pursue regional integration

The diversity of Africa’s agriculture and climate (see table 28 and map 29 on p.12) provides major opportunities for regional trade – especially since spatial correlation around rainfall and production tends to be low, even within a subregion. However, only about 10% of agricultural trade is currently from within Africa. Although member states of all subregions have agreed to pursue free trade, implementation remains slow. Rather than export and import restrictions in order to protect their vulnerable populations when markets peak or collapse, governments can use more efficient instruments, such as strategic reserves or enhanced social protection systems.

Border trade continues to incur high transaction costs from official red tape and bribes. It has been estimated that the Burundi-Rwanda border adds the equivalent of 174 kilometres in terms of effect on food prices, the DRC-Rwanda border 1,600 kilometres.<sup>43</sup> Simplification, greater transparency and, within subregions, harmonisation of procedures (on export/import licences, certification of origin, standards and sanitary regulations) are required. A Ghanaian grain trader association negotiated an agreement with border officials to recognise its trucks, thus speeding up border crossing.

### Tap opportunities in international trade

Global agro-industrial exports have diversified significantly over the last two decades, towards processed and high-value horticultural products – accounting in 2008 for around half of global agro-industrial exports, three-quarters if semi-processed commodities are added.

<sup>41</sup> More on this in “The global food equation”. Schaffnit-Chatterjee. DB Research. September 2009

<sup>42</sup> Sustainable intensification: A new paradigm for African agriculture. The Montpellier Panel 2013.

<sup>43</sup> Africa can help feed Africa. World Bank. October 2012.



## Agricultural value chains in Sub-Saharan Africa

### What is agribusiness?

47

Agribusiness is a term used to encompass farming plus all the other industries and services that constitute the supply chain. It covers input suppliers, agro-processors, traders, exporters and retailers and can be broken down into 4 main groups:

**Agricultural input industry**, such as agricultural machinery, equipment and tools; fertilisers, pesticides, insecticides; irrigation systems and related equipment;

**Agro-industry** (all the post-harvest activities involved in the transformation, preservation and preparation of agricultural production for intermediary or final consumption of food and non-food products): food and beverages; tobacco products, leather and leather products; textiles, footwear and garments; wood and wood products; rubber products; as well as construction industry products based on agricultural materials;

**Equipment for processing** agricultural raw materials, including machinery, tools, storage facilities, cooling technology and spare parts;

**Various services**, financing, marketing and distribution firms, including storage, transport, ICTs, packaging materials and design for better marketing and distribution.

Source: UNIDO

### Processing and value addition

48

Value addition involves processing (which can be as basic as labelling) but not all processing activities lead to value addition. Where processing uses resources which cost more than the additional amount buyers are willing to pay for the processed product relative to the raw product, value subtraction rather than value addition occurs. An example has been exporting fresh meat rather than animals (necessitating cooling, etc.) from the Sahel to coastal countries in the 1960s and 70s.

Optimal upgrading of agricultural value chains often involves a mix of upgrading into higher value-added products or functions and maintaining or expanding lower value added with high volume products or functions.

Source: UNIDO

Opportunities for SSA to enter high-value markets in traditional export markets include premium-quality coffee, cocoa, organic food and beverages and Fair Trade products.

The importance of SSA's trade with emerging markets is increasing, with China, India and Brazil combined buying a third of SSA's exports in 2012, China alone buying almost as much as the EU (around USD 100 bn).<sup>44</sup> In terms of agro-industrial imports, China's imports from Africa increased tenfold during 1990-2008 to USD 3 bn and India sixteen fold to USD 1.4 bn. Unprocessed commodities and horticulture constitute the vast bulk of SSA's agricultural exports to these two countries – with unprocessed commodities accounting for 86% of these exports to China in 2008, horticulture 51% of those to India.<sup>45</sup>

Trade reforms that lead to the removal of the most distorting policies that hurt African agricultural trade will help to expand export opportunities for SSA.

## E. Investing in agricultural value chains in SSA

Adopting a value chain approach is crucial given the basics farmers need access to. As mentioned above, they cannot succeed without an effective supply chain upstream and downstream. Strengthening supply chains adding value creates opportunities with many wins for investors, farmers, communities, countries in SSA and outside of the region by increasing global supply.

### 1. Africa needs more agribusiness

Given the central place of the sector in many of the region's economies, building on agriculture in SSA along the whole value chain can bring benefits in many respects and kick-start the development of broader manufacturing.

Apart from generating jobs, it can contribute to develop the skills, services and infrastructure needed for wider industrial development.

#### Local production of inputs: Higher availability and affordability

Increasing the local production of chemical fertilisers is a way to make them more available and affordable while creating employment and decreasing the foreign currency bill. Manufacturing nitrogen fertilisers is energy-intensive but large and mostly untapped natural gas resources bode well for SSA. The region also has a wealth of phosphorus (exported to Chinese and Indian farmers) which could be used in local production. Parastatals still dominate input supply in many SSA countries: the potential of the private sector is yet to be tapped.

Investments for manufacturing fertilisers in Nigeria are ongoing. Dangote Group plans to build Africa's largest fertiliser plant, scheduled to start producing ammonia-urea fertiliser in 2014 using Nigeria's gas supply. Elema Petrochemicals Company, backed by Indorama Corporation of Indonesia, also announced plans for an ammonia-urea plant. Nigeria suffers from some of the continent's most depleted soils and imports nearly 95% of its fertiliser needs. Olam is also reported to make a USD 1.2 bn investment in urea production in Gabon.<sup>46</sup>

<sup>44</sup> IMF data.

<sup>45</sup> Agribusiness for Africa's prosperity. UNIDO. May 2011.

<sup>46</sup> UNIDO, World Bank, press articles.



## Agricultural value chains in Sub-Saharan Africa

### Dairy in Kenya: Dualistic value chains

49

Kenya is Africa's leading producer and consumer of dairy products. Government's consistent policy and recent willingness to tolerate the development of both formal and informal segments have contributed to the sector's success.

It is also challenging to balance both segments, e.g. ensure the safety of dairy products and better position the industry for increased exports while allowing small producers and vendors to thrive.

Sources: FAO, World Bank

### Food processing for value addition, reducing waste and the import bill

The agricultural sector provides inputs for various sectors of light manufacturing, such as food processing, textiles and leather. Food processing tends to dominate this agro-industry in developing countries, including Africa.

Global food markets are rapidly growing and over 80% of the value in the global food industry is in value-added components ranging from sorting, cleaning and packaging for fruits and vegetables to processing and branding foods and beverages. Some of these value-added activities require skills, financing and scale but simpler changes can also capture higher value, e.g. canning, fruit drying, milk cooling or packaging.<sup>47</sup> Africa imports nearly USD 400 million of processed fruit juices and canned fruits and vegetables whereas fruits often go to waste from a lack of refrigeration facilities in combination with transportation or local processing.

These activities can provide a way for a farmer or SME to expand commercial activity and access higher-value markets, either domestic or export. They can provide employment for all, especially women who are particularly active in those sectors. Activities such as cleaning, packaging and freezing products are estimated to have increased Kenya's export value in the fresh vegetable sector by as much as 250%.<sup>48</sup>

### Cocoa in Ghana

50

#### Major driver of growth and poverty reduction

Around 20 million people depend on cocoa for their livelihoods in SSA. In Ghana, with 700,000 smallholder producers, cocoa has accounted for 28% of agricultural growth since 2000 and has become a major source of poverty reduction: the poverty rate declined from 52% in 1991 to 28% in 2006. A reformed and proactive national cocoa board (Cocobod), the promotion of high-yield hybrids and fertilisers as well as improvements in pest management reversed the decline in yields evident up to 2000. Still, yields are estimated to be 50-80% below potential, with wide variations among farmers.

#### Need for more organisation and more skills among smallholders

Concerned over West Africa's ability to keep up with growing global cocoa demand, global cocoa and chocolate manufacturers are also partnering with farmers to improve yields through improved plants, higher input use and better agronomic practices. Currently converting large shares of their production into certification schemes such as Fair Trade, cocoa manufacturers face the challenge of ensuring traceability along a supply chain including a large number of unorganised smallholders. Strong producer organisations can contribute to reduced transaction costs.

Sources: World Bank, FAO

### Linking formal and informal value chains for the benefit of both

Agricultural value chains in SSA tend to include both an informal and a formal component. The informal chain serves lower-income consumers in domestic markets with smallholder farmers and SMEs providing supply through small vendors. Through the formal chain, large farms and processors offer stronger quality controls to higher-income domestic consumers through supermarkets or export their products. Such dualistic value chains exist for instance for fruits and vegetables and dairy (see box 49).

To improve the performance of the informal value chains and generate employment, interactions with the formal value chains are often required. This allows access to capital, skills and markets for smallholder farmers. For instance, it is difficult for smallholders to participate in industries in which production is best done large-scale, such as sugarcane, or in which standards are demanding, such as fresh horticultural and floricultural exports. These industries are typically labour-intensive and create jobs.

The reason why agribusiness players are taking practical steps to secure sustainable financial success for small farmers and to integrate them into the global food supply chains is that their success depends on the success of small farmers (for instance, see box 50). Securing their supply is a major driver, but also sustainability and traceability. Indeed, customers increasingly demand transparency and are interested in knowing how their food is grown and how it affects local populations and the environment. Food safety issues also increasingly require traceability in global food supply chains. Local sourcing is also a way to minimise the impact of local currency depreciation.

<sup>47</sup> Press articles and Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.

<sup>48</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.



## Agricultural value chains in Sub-Saharan Africa

### Supermarkets emerging in SSA

51

The two most notable retailers in SSA are Shoprite and Massmart from South Africa. Others include for instance supermarket chains from Kenya (Nakumatt, Uchumi and Tusky's) where supermarkets, beginning in the mid-1990s, grew at 18% annually.

Shoprite is Africa's leading food retailer, with 1,246 corporate and 274 franchise outlets in 18 African countries.

Massmart runs 9 wholesale and retail chains, with 288 stores in 14 African countries. Wal-Mart, the world's biggest retailer, acquired 51% of Massmart in 2011.

Both retailers look to reach beyond national capitals and the rising middle class to serve interior points of sale and a broader customer base.

Sources: World Bank, UNIDO and press reports

### A nascent supermarket revolution

A rapidly expanding urban middle class is also driving the growth of supermarkets in SSA. They have spread rapidly over the past decade with South African chains leading the way (e.g. Shoprite, Pick-n-Pay), other retailers expanding across the continent and multinationals recently entering (e.g. Wal-Mart). Outside South Africa, where the share of supermarkets in national food retail was 55% in the early 2000s, the market share of supermarkets is still small (16% of total food retail sales in Kenya – 20% in cities – and 9% in Zambia) but they are likely to influence traditional retailing in terms of the range of offerings, product quality and more organised supply chains.<sup>49</sup>

It is important for small farmers to build capacity in order to benefit from the expansion of supermarkets. The step may be substantial but has high payoffs. The large retailers are already keen to develop local sourcing, including supporting direct farm procurement programmes.<sup>50</sup>

### A variety of agribusiness players in SSA

52

- Last year, Nestlé opened plants in Angola (powdered milk Nido and Nescafé) and DRC (Maggi cubes). It is present in various SSA countries such as Ghana and Kenya. (The company has invested USD 1.2 bn in Africa in the last 5 years).

- Unilever is well established in SSA, e.g. in Ghana and Kenya.

- Mars is involved in cocoa production in Côte d'Ivoire.

- Olam International, a major food producer from Singapore, is present in various SSA countries, e.g. Mozambique in rice and cotton farming, coffee in Tanzania and Zambia, cocoa in Côte d'Ivoire.

- Heineken produces Primus beer in DRC with rice now mostly grown locally after having contributed to the revival of the local rice industry.

- Diageo (manufacturer of Johnnie Walker, Guinness and Smirnoff) sources 50% of its local grain needs in Africa and aims at 70% by 2015.

- Coca-Cola has recently expanded in Tanzania and Kenya and claims readiness to disburse USD 12 bn between 2010 and 2020.

- Many of the leading foreign agricultural supply companies are present in SSA including Bayer, Syngenta, DuPont and Yara.

Sources: UNIDO, World Bank, press articles

## 2. From a development challenge to a business opportunity

Across Africa, there has been a renewed commitment from governments, NGOs and the private sector to move agriculture from a development challenge to a business opportunity. For various reasons, the time is ripe for global companies to invest in SSA along the food value chain. Economic growth, population growth and urbanisation are driving consumers' rising and changing needs. The trade deficit in agricultural commodities is growing, global demand is also increasing and there is much untapped agricultural potential in SSA.

At the same time, the macroeconomic and political situations are more stable than in the past; the business environment remains challenging but is continually improving. Investment has been steadily increasing in SSA, both foreign and domestic – and both private and public. Foreign direct investment (FDI), the main type of capital inflows into SSA, is fast increasing. Net FDI flows to SSA have reached USD 43 bn in 2013, up from USD 6 bn in 2000.<sup>51</sup>

An increasing number of global companies from various sectors are planning to establish or increase their presence in SSA, in order to tap the "last frontier". Efforts are underway by governments and other stakeholders to boost the performance of the broad agricultural sector in SSA, particularly through private-sector investment.

The share of agriculture in Africa's inward FDI stock is only 7%, compared to 15% for Latin America and 78% for Asia. There is much potential to attract a higher share of global resources and appetite is growing to tap into SSA's agribusiness markets (see box 52).<sup>52</sup> Nigeria expects USD 1.5 bn of foreign and domestic investment in agriculture in 2014.<sup>53</sup> In spite of well-known risks, the agribusiness sector in SSA offers two items which are hard to find anywhere else: available land and fast-growing consumer markets.

African agribusiness companies are also playing an active role in SSA and operating beyond their national borders, such as SAB Miller (a British beverage company with South African roots which has established its brands across the globe), Illovo Sugar, also from South Africa, and Dangote Sugar Refinery, a

<sup>49</sup> Modernizing Africa's fresh produce supply chains. Tschirley *et al.* Michigan State University Working Paper, 2010 and Agribusiness for Africa's prosperity. UNIDO. May 2011.

<sup>50</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.

<sup>51</sup> UNCTAD data. See also "Sub-Saharan Africa". Schaffnit-Chatterjee. DB Research. July 2013.

<sup>52</sup> Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013.

<sup>53</sup> Communicated to Reuters in April 2014 by Nigeria's finance minister Okonjo-Iweala.





## Agricultural value chains in Sub-Saharan Africa

Nigerian private company importing raw sugar from Brazil for processing in Nigeria.

### Agricultural finance over time

53

- **A supply-driven approach in 1950s-1970s:** input credit delivered through cooperatives and obtained from donors, government allocations and central banks. Agricultural banks established during that time were mostly unprofitable and ineffective.

- **More liberalised financial sectors in the 1980s:** the abolition of sectoral lending quotas resulted in bank lending to agriculture being almost halved.

- **Microfinance in the 1990s** did not benefit the farm sector much.

Source: AGRA

## 3. Financing agriculture and agribusiness

Financial requirements for African agriculture are substantial. Out of the USD 83 bn required annually to be able to feed 9 bn people in 2050, USD 11 bn would be needed in SSA. At the same time, limited access to finance is a well-known constraint on agricultural performance particularly for smallholders but also for larger agribusiness companies.<sup>54</sup>

### Challenges and main sources of financing

Access to affordable credit is insufficient for the majority of small-scale producers. On top of enabling them to afford basic inputs, appropriate financial arrangements can help them to be more productive by allowing them to invest in technology and innovation. Rural households in Africa are still largely reliant, for their financial needs, on informal providers.

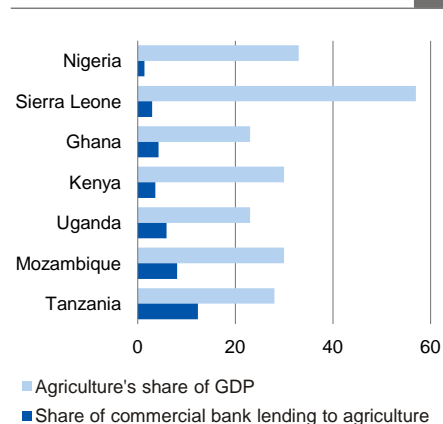
Challenges to finance smallholders include the number and variety of smallholders as well as the lack of security of land tenure (preventing land to be used as collateral). Smallholders can be segmented into three categories: non-commercial, commercial in loose value chains and commercial smallholders in tight value chains. Each segment has different cash flows and financial goals.<sup>55</sup>

In terms of sources of finance for agriculture, farmers are the main investors with various forms of capital (physical, human, intellectual, natural, social and financial). An analysis of 23 countries in SSA revealed that on-farm agricultural capital stock represents 84% of the total average annual investments in agriculture. Domestic public investments follow (see D 3 p. 19). Foreign public investments (from development partners) and foreign private investment are also significant.<sup>56</sup>

### Financial institutions

#### Little lending from domestic banks

54



Sources: FAO, Deutsche Bank Research

Although agriculture represents around 25% of GDP in SSA, the share of commercial bank lending to agriculture remains very low: 3% in Sierra Leone, 4% in Ghana and Kenya, 6% in Uganda, 8% in Mozambique and 12% in Tanzania (see chart 54). Reasons include: 1) high transaction costs due to spatial dispersion combined with lacking infrastructure and heterogeneity of clients, commodities and regions; 2) lag between investment needs and expected revenues; 3) lack of usable collateral; 4) number of risks involved: pests and diseases, weather, price and policy risks.<sup>57</sup>

Regarding the latter, failure to manage risks has direct repercussions on farmers' incomes, market stability and access to financing. The two main risks faced by farmers – yield volatility and price volatility – are expected to rise, mostly due to 1) climate change driving an increased occurrence of extreme weather events and 2) long-term global supply/demand imbalances, driven by increased demand combined with scarcity of water, arable land and energy. Information technologies also allow easier access to remote rural areas, risk

<sup>54</sup> World Bank and AGRA.

<sup>55</sup> Segmentation of smallholder households. Christen R. and J. Anderson. CGAP, 2013.

<sup>56</sup> Who invests in agriculture and how much? Lowder, Carisma and Skoet. FAO-ESA, 2012.

<sup>57</sup> See also Risk management in agriculture. Schaffnit-Chatterjee. DB Research. September 2010.



## Agricultural value chains in Sub-Saharan Africa

reduction and increased aggregation in ways which benefit the farmer, the financial service provider and the investor.

### *Innovative financing*

#### Reducing the risk of lending to agribusiness

55

Apart from portfolio diversification, innovative instruments are available to reduce the risks related to agricultural investment.

- Insurance through *Weather-indexed risk management products* where payments are linked to a weather proxy for crop losses like rainfall deficit, eliminating the need for monitoring actual losses.

- *Futures and options* markets provide hedging against price risk. There are few such markets in SSA. While these markets are still small in SSA, South African Futures Exchange (SAFEX) is the biggest and oldest. However, exchanges are still being created e.g. recently in Ethiopia and currently in Rwanda.

- *Partial credit guarantees* to share risks with selected commercial banks on portfolios of new loans.

- *Warehouse receipt systems* allow farmers to deposit a stated quantity of a specified quality of a commodity into a private warehouse and receive a receipt, as evidence of location and ownership, which can be claimed as collateral. This system also protects farmers against low sales prices (by providing storage until market prices become more attractive) and helps large-scale accumulation.

The range of products available for banks to support agriculture and agribusiness is slowly increasing. Different innovative financing approaches for agriculture have emerged over the past few years, linking large capital investments to agricultural development – facilitating access to financial capital for investment in the agriculture sector and reducing risks to attract private investors. Examples include public-private partnerships, agricultural insurance schemes and credit guarantee schemes.

Another way to increase access to agricultural capital is financial intermediation through agents in the value chain (input suppliers or output processors). They are in a good position to cost-effectively monitor on-farm behaviour and enable financial institutions to accept crops as collateral.

For instance, the Agricultural and Trade Investment Fund (AATIF) finances local projects and companies along the agricultural value chain and develops financial markets across SSA.<sup>58</sup> This public-private partnership aims at uplifting Africa's agricultural potential through the promotion of economically, socially and environmentally sustainable projects across Africa.

Commercial banks are active in trade finance, e.g. providing funding for the export of commodities from SSA. They also finance global companies importing into SSA for infrastructure development.

The development of commodities exchanges in SSA may encourage banks to do more agricultural lending in ranges between microfinance and big trade deals, through more possibilities of warehouse-receipt financing. The Ethiopia Commodities Exchange (ECX) has managed warehouses and helped grade produce to be traded on the exchange, allowing farmers to be paid promptly – the next day. It also deployed electronic information and trading systems, disseminating full knowledge of prices. It also drove a better understanding of clearing and settlement, with more modern banking technologies.<sup>59</sup>

### *Role of financial investors in making agribusiness benefits more widespread*

Investors can play an important role by integrating ESG (Environmental Social Governance) concerns into investment decisions and by paying greater attention to inclusiveness issues. Investors are in a position to ensure that the investment in agriculture will bring yield increases benefiting also the host country, that labour standards are enforced, pollution avoided, community health not impaired (e.g. through contaminated water) and biodiversity not compromised in a major way. Government and donors can encourage equity shares by local communities in emerging companies. Investors can transfer technology, skills and social services to local communities, even in the absence of contract farming or outgrower arrangements. Large investments often provide improved infrastructure for local communities, on top of tax revenue.

<sup>58</sup> See AATIF annual report 2013. <http://aatif.lu>

<sup>59</sup> Various press articles including "Fast finance for the new frontier of food". Euromoney. September 2013.



## Conclusion

SSA needs investment in agriculture and agribusiness to ensure efficient and sustainable agricultural production. This can drive economic growth and poverty reduction in SSA and fulfil both domestic and global demand for agricultural products. In spite of well-known risks, SSA offers both huge agricultural potential and fast-growing markets. There is increasing investor interest in SSA along the whole food supply chain. Challenges remain in terms of infrastructure, trade, skills and financing but there is increased commitment from governments and other partners for a sector with strong growth opportunities.

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