PART I

Chapter 2

Agriculture in Sub-Saharan Africa: Prospects and challenges for the next decade

This chapter reviews the prospects and challenges facing the agricultural sector in Sub-Saharan Africa over the next decade. It reviews sector performance, outlines the current market context, provides detailed quantitative medium term projections for the ten-year period 2016-25, and assesses key risks and uncertainties. The outlook for agriculture in Sub-Saharan Africa is situated in the context of several mega-trends that shape the sector's development. These include rapid population growth, urbanisation and rural diversification, an associated structural transformation from farm to non-farm employment, a growing middle class, and increasing interest (both domestically and globally) in the continent's farmland. The Outlook for agriculture is broadly positive, but could be further enhanced by consistent policies and strategic investments, in particular in rural infrastructure.

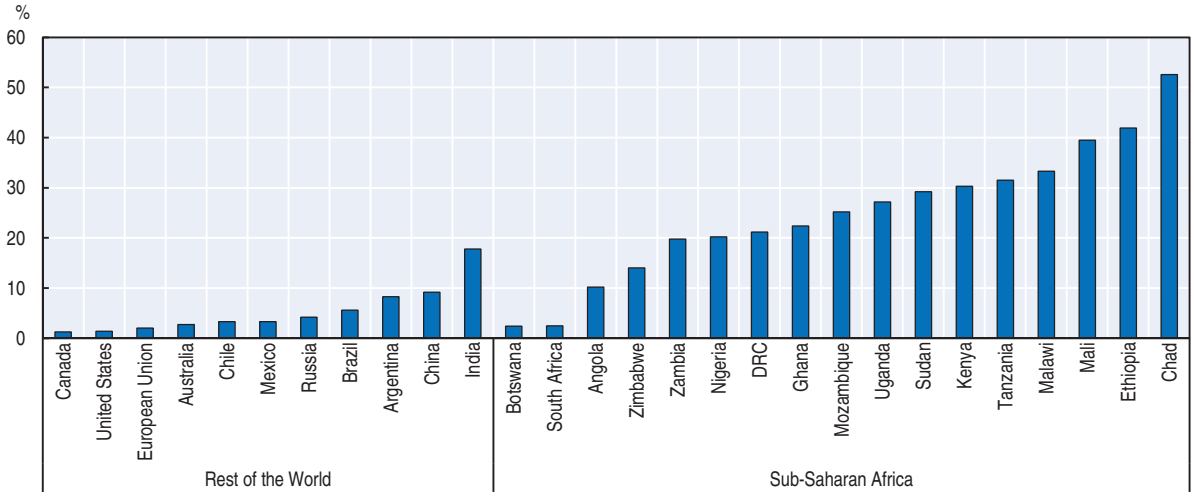
Introduction

The Sub-Saharan Africa[1] (SSA) region accounts for more than 950 million people, approximately 13% of the global population. By 2050, this share is projected to increase to almost 22% or 2.1 billion. Undernourishment has been a long-standing challenge, with uneven progress across the region. Despite being reduced from 33% in 1990-92 to 23% in 2014-16, the percentage of undernourishment remains the highest among developing regions (FAO, IFAD and WFP, 2015). Owing to rapid population growth of 2.7% p.a. over the same period, the absolute number of undernourished people has increased by 44 million to reach 218 million. Slow progress towards food security has been attributed to low productivity of agricultural resources, high population growth rates, political instability and civil strife. However, vast regional differences remain and the success achieved in countries with stable political conditions, economic growth and expanding agricultural sectors suggests that appropriate governance systems, institutional capacities, and macro-economic, structural and sectoral policies can work together to improve food security on a long-lasting and sustainable basis.

The important role of the agricultural sector in contributing to food security is reflected in its prioritisation in the development agenda. The Comprehensive African Agricultural Development Programme (CAADP) is an integral part of the New Partnership for Africa's Development (NEPAD) and the sector's prominence in the region is evident in its contribution to total GDP, which is generally high in the global context. The high contribution of the agricultural sector to GDP also underlines the limited diversification of most African economies. On average, agriculture contributes 15% of total GDP, however it ranges from below 3% in Botswana and South Africa to more than 50% in Chad (Figure 2.1), implying a diverse range of economic structures. Agriculture employs more than half of the total labour force (IMF, 2012) and within the rural population, provides a livelihood for multitudes of small-scale producers. Smallholder farms constitute approximately 80% of all farms in SSA and employ about 175 million people directly (Alliance for a Green Revolution in Africa, 2014). In many of the countries, women comprise at least half of the labour force (FAO, 2015).

Given its role in confronting the challenge of eradicating hunger and improving food security, this chapter considers the historic performance and current state of agriculture in SSA, within the context of the region's political and economic conditions, natural resource situation and demographic structure. It acknowledges the role of policies and megatrends[2] in shaping development of the agricultural sector. Megatrends include demographic change, the rise of the African middle class, growing access to new information and communication technologies, rapid urbanisation and consequent shifts in food demand. This is accompanied by downstream modernisation of food systems, a considerable shift in the labour force from farming to nonfarm jobs, and rising global interest in available African farmland strengthened by the sharp rise in agricultural commodity prices over the past decade.

Figure 2.1. **Agriculture as a share of total GDP in 2014**



Note: DRC refers to Democratic Republic of the Congo.
Source: World Bank (2016).

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These megatrends are not inevitable and remain subject to a degree of uncertainty as well as future policies. The focus on SSA as a whole risks perpetuating a view of Africa as a single entity, however this chapter aims to provide an agricultural outlook, with a wider consideration of links to growth and food security, that reflects the complexity within the region.

The agricultural environment in Sub-Saharan Africa

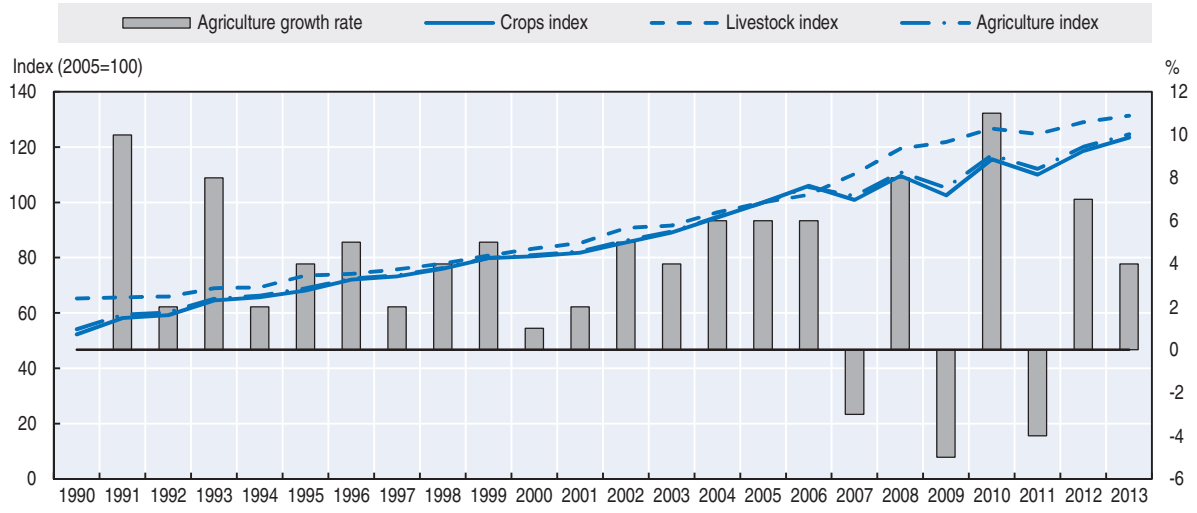
After decades of stagnation, much of Africa is now experiencing rapid economic transformation. In the post-structural adjustment period, the business environment has become more stable and albeit from a small base, the region has experienced rapid economic growth since the mid-1990s. These domestic factors in combination with the global "commodity boom" enabled commodity exporting countries in particular to achieve growth rates above or near 6%. However, the recent decrease in agricultural commodity prices, lower demand arising from China and currency depreciation have tempered growth rates in African economies. Foreign investment and external financial flows into Africa have quadrupled since 2000. These flows are expected to increase further in the coming years (AfDB, OECD & UNDP, 2014),[3] while internally generated funds in the form of tax revenues continue to rise across the continent.

Drivers of agricultural growth

Evident from its high share in GDP (Figure 2.1), the prospects of the agricultural sector heavily influence economic development in most countries in Sub-Saharan Africa. From 1990 to 2013, the total value of agricultural production, measured in constant US dollars, increased by 130% (Figure 2.2). The crop sector dominates total agricultural production value, accounting on average for almost 85% of total production value over the 24-year period. This share differs across the region, ranging from 53% in Southern Africa, to more than 90% in Western Africa.

Figure 2.2. **Gross agricultural production value in Sub-Saharan Africa**

Measured in constant 2004-06 US Dollars



Source: FAOSTAT (2016), FAO, *http://faostat3.fao.org/*.

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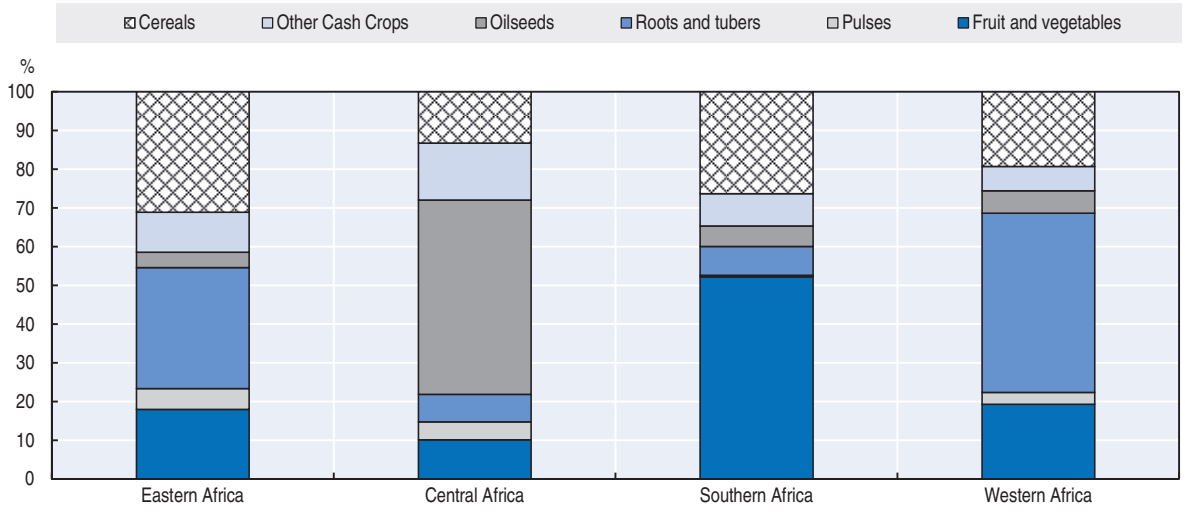
Regional differences in the relative contribution of the crop and livestock sub-sectors reflect agro-ecological and cultural diversity. Significant growth was evident across SSA over the past 24 years, but Western Africa continues to account for more than 60% of the total value of agricultural output in SSA, while Southern Africa contributes 22%. Western Africa has also been the greatest driver of volatility in total production value since 2007 (Figure 2.2), mainly due to volatile yam production in Nigeria. Despite the diversity in crop mix across the region, the crop sector's share of total production value is significantly higher in all sub-regions except Southern Africa, where the shares of livestock and crop production value are similar.

Within each of the four sub-regions, the five biggest crops contribute more than 45% of total crop production value, with maize being the single most important staple crop. Rice is an important staple in Eastern and Western Africa, and other important staples include potatoes (Eastern and Central Africa), sweet potatoes (Eastern Africa), cassava (Western and Eastern Africa) and plantains (Eastern and Central Africa). In Southern Africa, the strong share of fruits and vegetables in total value of production is due to South Africa's export oriented horticultural production.

The livestock production mix exhibits similar diversity, not only in its contribution to the total value of agricultural output, but also to the relative importance of the different livestock subsectors. Poultry contributes a substantial share of livestock production value across the region, ranging from 12% in Eastern Africa to 45% in Central Africa and Southern Africa (Figure 2.4). Interestingly in Central Africa, where livestock production value is smaller than any of the other three regions, game meat accounts for 35% of livestock value. Livestock production systems remain largely extensive, with pasture based ruminant production often the only system able to add value in semi-arid areas. Often the movement of livestock in line with seasonal changes and fodder availability remains the only way of securing feed for large herds (NEPAD, 2014). At the same time, vertically integrated, intensive poultry operations that link commercial feed grain producers to feed mills,

Figure 2.3. **Crop mix across the Sub-Saharan African region**

Based on average value of production 2011-13



Source: FAOSTAT (2016). FAO, *http://faostat3.fao.org/*.

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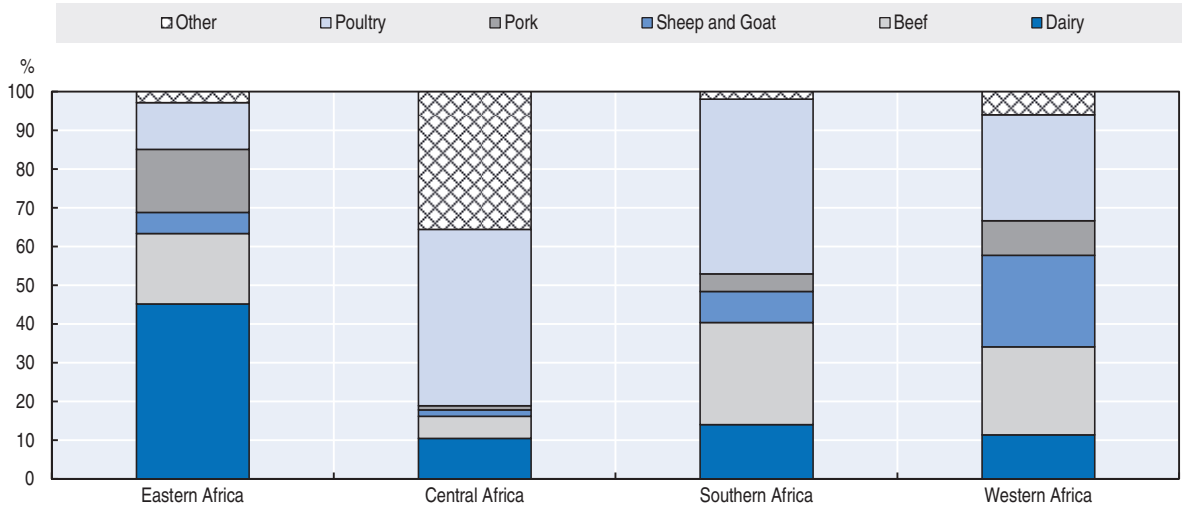
Figure 2.4. **Livestock mix across the Sub-Saharan African region**

Based on average value of production 2011-13



Source: FAOSTAT (2016), FAO, *http://faostat3.fao.org/*.

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abattoirs and wholesalers have been evident for many years in some countries (such as South Africa) and have recently started expanding in others (such as Zambia and Tanzania). Such operations target urban consumption centres characterised by rapid growth in food demand.

Fisheries and aquaculture also make a multifaceted contribution to national economies in SSA. The region has vast fish resources, in marine and inland waters, and is characterised by diverse fishing communities. Small and industrial-scale fishing targets a diverse array of species for local and international consumption. Benefits generated by the

sector include nutrition and food security, livelihoods, employment, and foreign revenue. Similarly to other agricultural sub-sectors, fisheries and aquaculture are considered to be underutilised, despite inherent potential. Total fishery production in the region represents only about 4% of world production and growth prospects are limited in the next decade. Fisheries and aquaculture in SSA faces enormous challenges and deficiencies which are limiting the capability of most governments to ensure its sustainability and profitability. Challenges include inadequate management of fish stocks; lack of knowledge and evidence to foster reforms; untapped potential of small-scale fisheries; weak and uncoordinated institutions; limited or ineffective institutional and legal frameworks; weak scientific research; inadequate human and financial resources; lack of reliable, relevant and timely information; lack of adequate infrastructure and services; and climate change, which is expected to change future fisheries production patterns, as species move to new habitats.

Agricultural growth has been underpinned by area expansion

The African model of agricultural growth differed significantly from that of Asia or South America. In Asia, growth was driven largely by intensification, whereas in South America, it was the result of significant improvement in labour productivity arising from mechanisation. By contrast, strong growth in SSA agricultural output has accrued predominantly from area expansion and intensification of cropping systems, as opposed to large-scale improvement in productivity (NEPAD, 2014; Brink and Eva, 2009). While the agricultural labour force has expanded, NEPAD (2014) notes that productivity per agricultural worker has improved by a factor of only 1.6 in Africa over the past 30 years, compared to 2.5 in Asia.

Given that SSA is generally regarded as land abundant, continued area expansion in the coming decade may not seem problematic. However rural SSA is highly heterogeneous and while much of its land is unutilised or underutilised, a considerable share of its rural population resides in smallholder farming areas that are densely populated and face land shortages (Jayne et al., 2014). In a wider assessment that considers a combination of biophysical and economic factors as criteria for viability, Chamberlin et al. (2014) indicate that potentially arable cropland is highly sensitive to assumptions related to land productivity and market access. Much of the underutilised land is concentrated in relatively few countries and between one half and two thirds of surplus land is currently under forest cover. Conversion of such forest land to agriculture would come at considerable environmental cost.

In land constrained countries, area driven growth may come at the expense of fallows. Rising rural populations and associated land pressures has resulted in continuous cropping in many African countries, with fallows largely disappearing in densely populated areas.[4] Continuous cultivation of existing plots would not necessarily pose problems for sustainable intensification if sufficient use of fertilisers, soil amendment practices and other land-augmenting investments are employed and coupled with continued education to maintain and improve soil quality. However, a large body of literature in SSA points to soil degradation arising from unsustainable cultivation practices in regions with a high population density, for example parts of Kenya and Malawi (Stoorvogel and Smaling, 1990; Drechsel et al., 2001; Tittonell and Giller, 2012). Continuous cultivation and lack of crop rotation deplete organic carbon levels, making soil less responsive to fertiliser application. This also makes it more difficult for smallholder farmers to benefit from yield gains offered by plant genetic improvement.

Agriculture's contribution to employment

The agricultural sector has a pivotal role in employment in SSA, employing more than half of the total workforce. While its importance to the rural population is well documented, recent surveys suggest that agriculture is also the primary source of livelihood for 10% to 25% of urban households. National census data indicates that the number of people employed primarily in agriculture has increased over time (Yeboah and Jayne, 2015).

As a consequence of rapid population growth, SSA has a young population, which will result in about 17 million people entering the labour force annually over the next decade (Losch, 2012; IMF, 2015). Given current employment growth rates, less than half will be absorbed into gainful non-agricultural employment and even under more favourable policy and growth scenarios, the share rises to two thirds at most (Fine et al., 2012). Consistent with employment trends by the Groningen Global Development Centre (2013), the World Bank reports that family farming will remain the single largest source of employment in the coming decade (Filmer and Fox, 2014). Thus youth participation in agriculture will largely depend on the viability of family farming.

Innovative ways of facilitating youth participation in agriculture have the potential to drive widespread poverty reduction among youths and adults alike. A coherent and integrated approach that addresses challenges related to education, land access and tenure, access to financial services, access to markets, access to green jobs and involvement in policy dialogue has the potential to make the agricultural sector more attractive to young people, providing the additional push that may be needed for them to enter the sector (FAO, CTA and IFAD, 2014).

The potential for urbanisation and income growth to stimulate job expansion in downstream segments of the food system also depends on where the primary agricultural products come from. Faster growth in domestic production arising from commercialisation could generate job growth in food assembly, wholesaling, processing and retailing. Box 2.1 provides further detail on the emergence of the West African food economy and the role of value addition in creating employment opportunities.

Box 2.1. **Emergence of a West African food economy**

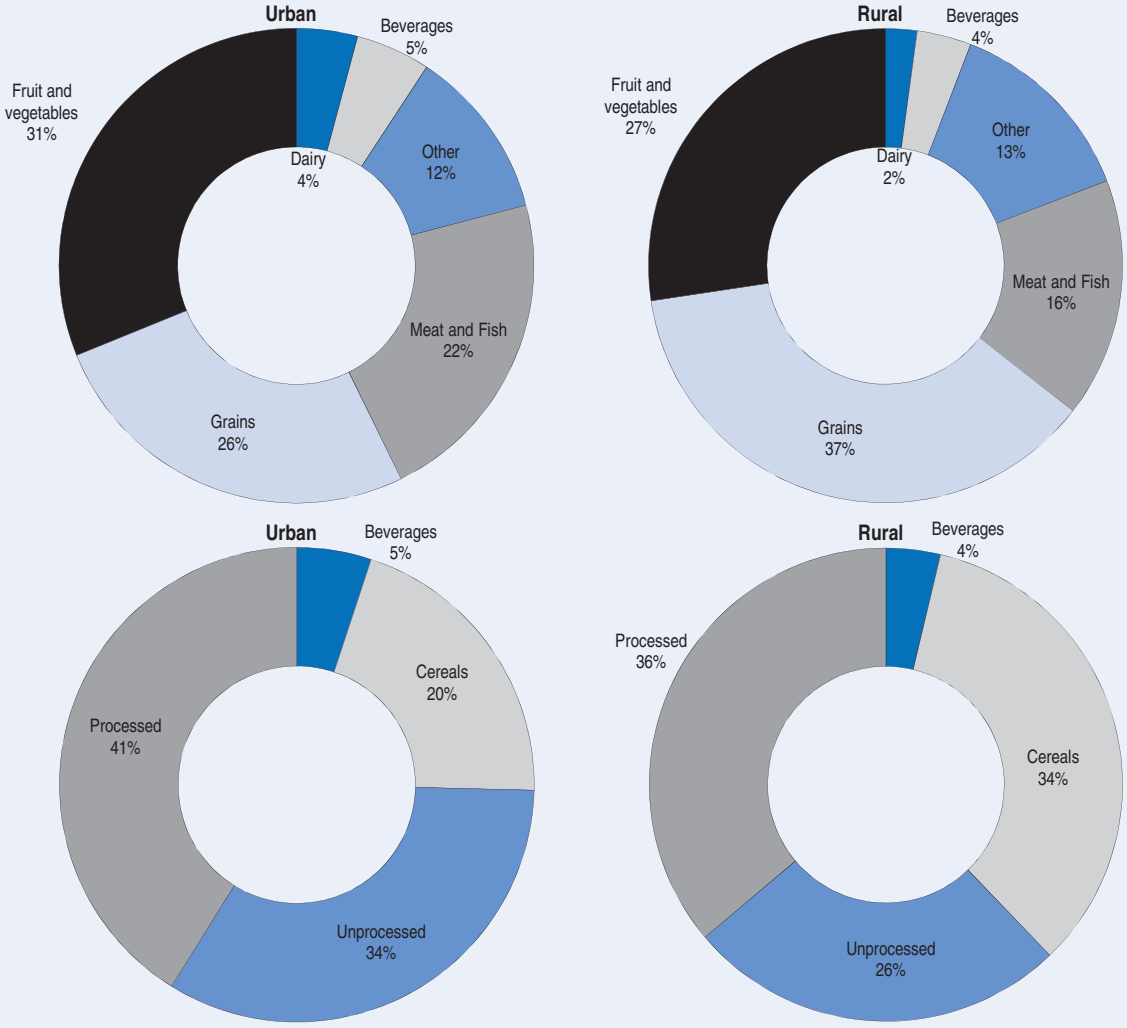
West Africa's cities are now home to 133 million people, 25 times more than in 1950. Between 2000 and 2010 alone, the urban population grew by over 48 million people. Consequently, the size of the food economy grew spectacularly. Bolstered by urbanisation and income growth, household food consumption patterns are changing and the food economy is developing.

A growing number of households are turning to markets for their food supply. In urban areas, almost all food is bought on the market with an average of 93% of household food consumption supplied through various distribution channels. At the same time, increasingly diversified rural economies and the spread of urban products and lifestyles mean that the share of rural food supply from markets is also growing. Overall, markets provide at least two-thirds of household food consumption at the regional level (OECD, 2013).

Urbanisation and urban lifestyles are also accompanied by shifts in dietary patterns, which are spreading beyond the frontiers of towns and cities. More fruits, vegetables and processed foods are being consumed, while the share of cereals and pulses is declining. Urban consumers are clearly moving towards higher value food products. Fruits and vegetables, and meat and fish now account for half of the total food expenditure by urban households. The demand for convenience is an overarching trend across income groups and area. This is reflected in the strong demand for processed and prepared foods and in the expansion of street food. In urban areas, processed foods represent 41% of food budgets. Rural households, although less than their urban counterparts, still spend 36% of their budget on processed foods (Figure 2.5).

Box 2.1. **Emergence of a West African food economy** *(cont.)*

Figure 2.5. **West African food basket by food groups and area in 2010**



Source: Global Consumption Database, World Bank; SWAC/OECD.

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The combined effects of rapid urbanisation, population growth and resulting transformations in food demand have had major impacts on the size of the West African food economy and its structure. Using recent expenditure and consumption surveys compiled by the World Bank, the size of the West African food economy is estimated at USD 178 billion in 2010.[1] This represents 36% of regional GDP, making it the largest sector of the West African economy. In many countries, the domestic food market is becoming more attractive for farmers than traditional export cash crops. The non-agricultural postharvest activities of the food economy, such as processing, logistics and retail, are developing quickly. These account for 40% of the sector's value added and will continue to expand (Allen and Heinrigs, 2016).

The emergence of local food industries and processing facilities creates increasing employment opportunities in processing, packaging, distribution and retail in urban and rural areas. In many rural areas the non-farm rural economy is growing rapidly and driving economic transformations.

Box 2.1. **Emergence of a West African food economy** *(cont.)*

To fully leverage the opportunities associated with urbanisation and the development of the food economy, a refocusing of agricultural policy towards an integrated food policy is needed. Supporting farmers in satisfying urban demand for fruits and vegetables, and meat and fish needs to be complemented by improving the business environment for agro-food businesses in processing, distribution and retail, and by improving the connections between urban areas and their rural hinterlands.

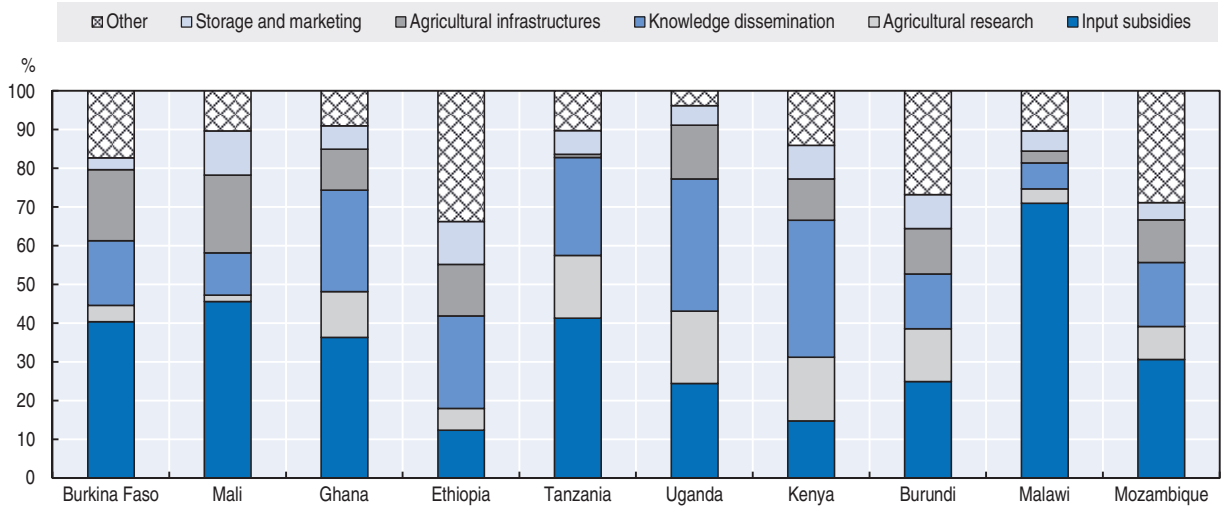
1. Calculated as the sum of all food consumption and adjusted by GDP figures.

Agricultural policies in Sub-Saharan Africa

Motivated by the need for a vibrant and sustainable agricultural sector, a number of policy initiatives have been integral to the sector's development over the past decade. CAADP was prioritised within the 2003 Maputo Declaration on Agriculture and Food Security through commitments to allocate at least 10% of national budgetary expenditure towards its implementation and aimed to achieve a 6% annual growth of the agricultural sector. Less than 20% of countries have achieved their commitment on agricultural spending. More recently, these commitments were reaffirmed in the Malabo[5] declaration on accelerated agricultural growth, which pledged to end hunger in Africa by 2025.

Despite the prioritisation of the agricultural sector, FAO's Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme notes an overall decreasing trend in the share of public resources channelled to agriculture in the ten countries reviewed in 2013.[6] These countries have spent public funds on a broad range of consumer and producer support policies (Figure 2.6). However, some of these expenditures may have targeted primarily short-term objectives that may not have been fully aligned with long-term development goals for the sector (AfDB, FAO and ECOWAS, 2015). The strategic development of the agricultural sector would benefit from increased policy focus on

Figure 2.6. **Public expenditure on the agricultural sector in selected Sub-Saharan African countries**



Source: Angelucci et al. (2013).

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infrastructure, research and development. A lack of stability in the political and policy framework has been identified by numerous researchers as a constraining factor to the sector's development. Consistency of policy applications will remain a key factor shaping the success of the sector within the development agenda.

As a form of producer support targeting improved productivity, fertiliser subsidy programmes have been employed in a number of countries and while successful in accelerating yield growth in countries such as Zambia and Malawi, the ultimate effectiveness of such programmes in the long-run remains disputed, with the costs often found to outweigh the benefits (Jayne and Rashid, 2013). As an alternative, a holistic approach to support small-scale producers has been encouraged. This includes investment in agricultural R&D, extension programmes focused on improved soil quality and physical infrastructural development.

The establishment of strategic food reserve systems to support food security was a resolution within the Maputo declaration on agriculture and food security. Consequently most of the funds allocated to consumer related programmes in the region have been spent on maintaining public food stocks of important staple grains. The implementation costs, as well as the price distorting impacts of such policies are important considerations. They have been minimised where their application is based on transparent target prices that are in line with import and export parity levels. Additionally, governments used temporary trade policies such as export bans or import tariff reductions to support consumers.

Production growth in SSA has failed to keep pace with demand deriving from population and income growth, resulting in rising imports for food commodities such as wheat, rice and poultry. In many instances, import tariffs have been employed to support domestic producers, particularly relative to other producers outside the region. Box 2.2 illustrates some of the possible benefits from increased intra-regional trade in Eastern and Southern Africa. Multiple regional trade agreements in Africa, such as the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Economic Community of West African States (ECOWAS) and the Southern African Development Community (SADC), have been successful in reducing tariff rates, but have also been accompanied by a commensurate rise in non-tariff measures. Implementation of the tripartite free trade area, established in 2015 between SADC, COMESA and the EAC will result in the largest economic bloc on the continent, covering more than 50% of Africa's population and GDP, it has the potential to impact significantly on trade in the region.

Box 2.2. **The role of intra-regional trade in reducing market volatility and improving food security across Eastern and Southern Africa**

High domestic food price volatility has been a recurring issue in many African countries. It poses a particular risk to the food security of poor households that spend a greater share of their income on food and for households depending on agriculture for their livelihood. The perceived need by governments to stabilise volatile prices and supply has long motivated their interventions in agricultural markets, despite the international drive towards liberalisation (Jayne and Tschirley 2009, Minot 2014). In reacting to these market shocks, governments are often faced with the need to balance short-term food security objectives with the longer term goal of raising productivity growth. In SSA, the most food insecure region in the world, achieving this balance remains a challenge, yet consistent policy application remains critical.

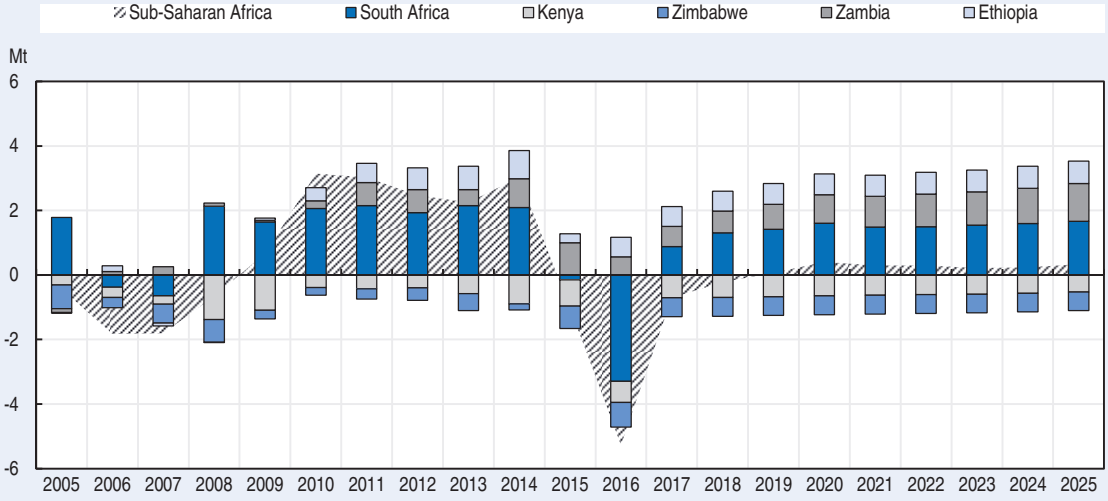
Box 2.2. **The role of intra-regional trade in reducing market volatility and improving food security across Eastern and Southern Africa** *(cont.)*

The role of intra-regional trade in reducing volatility and improving food security was recognised by the African Union (AU) in its Malabo Declaration on accelerated agricultural growth, which committed to boosting intra-African trade in agricultural commodities and services. Reductions in barriers to regional trade offer an inexpensive means of reducing domestic prices and hold enormous potential to improve food security in the region. This positive contribution is already evident in regions where neighbouring countries are pooling production to stabilise markets through cross border trade (Mozambique-Malawi, Malawi-Zambia, Uganda-Kenya) (Chapoto and Sitko, 2014).

The emergence of Zambia as a consistent surplus producer, particularly for maize, has resulted in changing regional trade patterns in Eastern and Southern Africa. A favourable transport differential and the absence of genetically modified (GM) technology have made it the preferred source for Zimbabwean imports. At the same time, discretionary trade restrictions from the Zambian government have influenced the consistency of supply into Zimbabwe, impacting on price volatility. Over the course of the Outlook projection, the extent to which Zambia continues to grow as an exporter into Zimbabwe and other deficit countries in the region will depend on the consistency with which its trade policies are applied. South Africa and Uganda have maintained open trade policies and are projected to continue supplying exports consistently into the region. Assuming that borders remain open, Zambia is also projected to expand exports, becoming the second largest maize exporter in SSA in the coming decade (Figure 2.7).

While intraregional trade in maize is higher, it still accounts for less than 10% of total trade in food staples. Informal trading charges, burdensome border regimes and limited transportation infrastructure have all been identified as impediments. Priority should be given to actions and investments that reduce these impediments and put in place more predictable rules-based systems (Morrison and Sarris, 2016).

Figure 2.7. **Net trade of maize in Eastern and Southern Africa**



Note: The shaded area in the figure illustrates the aggregated net trade position for maize in SSA, and the stacked bar charts illustrate the net trade position of the largest importers and exporters in ESA.

Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), *http://dx.doi.org/10.1787/agr-data-en.*

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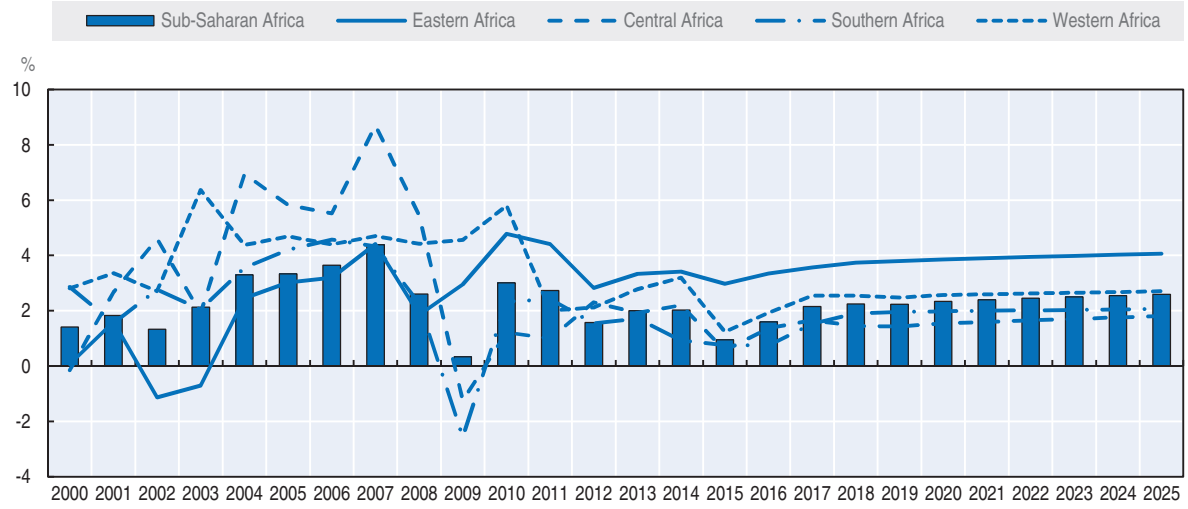
Key factors underlying the agricultural outlook for the region

The prospects for production, domestic demand and trade of agricultural commodities in the region are influenced by a host of agro-ecological, economic, demographic and political factors. The level of income available in the domestic food market is driven by general economic development in the countries. The prospects of several countries that are highly dependent on commodity exports have declined and per capita GDP growth is projected to stagnate over the coming decade, resulting in a significant slowdown in the Central, Southern and Western African regions (Figure 2.8). Accelerated output growth in the Eastern African region offsets some of the decline however and GDP per capita for the entire SSA region expands only marginally more slowly in the coming decade (2.3% p.a.) relative to the past (2.4% p.a.).

Figure 2.8. **GDP growth per person in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en*.

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Income distribution: Rise of an African middle class?

SSA as a region reflects some of the highest inequality rates in the world and while there is evidence of rising incomes, the increasingly skewed distribution of wealth in many countries slows the rise of middle class consumers and thereby constrains the increase in domestic food expenditures. The African Development Bank (AfDB) defined middle class as per capita daily consumption of USD 2-20 in 2005 purchasing power parity terms and indicates that its share of the population has expanded from 27% in 1990 to 34% in 2010. However, roughly 60% of the middle class in 2010 were in the USD 2-4 per capita consumption group–barely out of the poor category and in constant threat of falling back into it (AfDB, 2011).

Demographic structure

Population growth within SSA has significantly outpaced any other region in the world. Since 1990, the SSA population expanded by 96%, more than double the world average of 38% (45% in Oceania, 37% in Asia, 27% in North America and less than 3% in Europe). Over the next decade, a further expansion of 28% is projected, compared to a

global average of only 11%. The rapid expansion has resulted in a unique demographic structure and more than 60% of the population is below the age of 25, as opposed to 41% in Asia and only 27% in Europe. The economic potential of demographic dividend, the time period during which the share of the working-age population is larger than the non-working-age share, should be acknowledged.

The share of the population residing in urban areas has increased to 38% in 2015, from 27% in 1990, a rate similar to South America and Southern Asia. By 2025, it is projected to increase to 42%, impacting on income levels and dietary patterns. Despite urbanisation, the rural population has continued to increase in absolute numbers and surveys indicate that even in urban areas agriculture still represents the primary livelihood for up to 25% of the population. Enhanced productivity in agriculture therefore appears to have the greatest potential to directly improve rural livelihoods, while stimulating effective demand and job opportunities in the nonfarm sector through multiplier effects generated from productivity gains.

Emerging medium-scale producers

The surge in global food prices post 2007, combined with agricultural subsidies and land policies in many countries accelerated the demand for agricultural land in SSA. Land acquisitions by foreign and African investors have increased dramatically leading to the rapid rise of medium- and large-scale "emergent" commercial farms (Jayne et al., 2015). Development Health Survey data indicates that urban households now control 10-30% of total agricultural land. Evidence also suggests that existing land policies are leading to increased inequality of landholdings and in some cases may be making it more difficult for area expansion in densely populated smallholder farming areas.

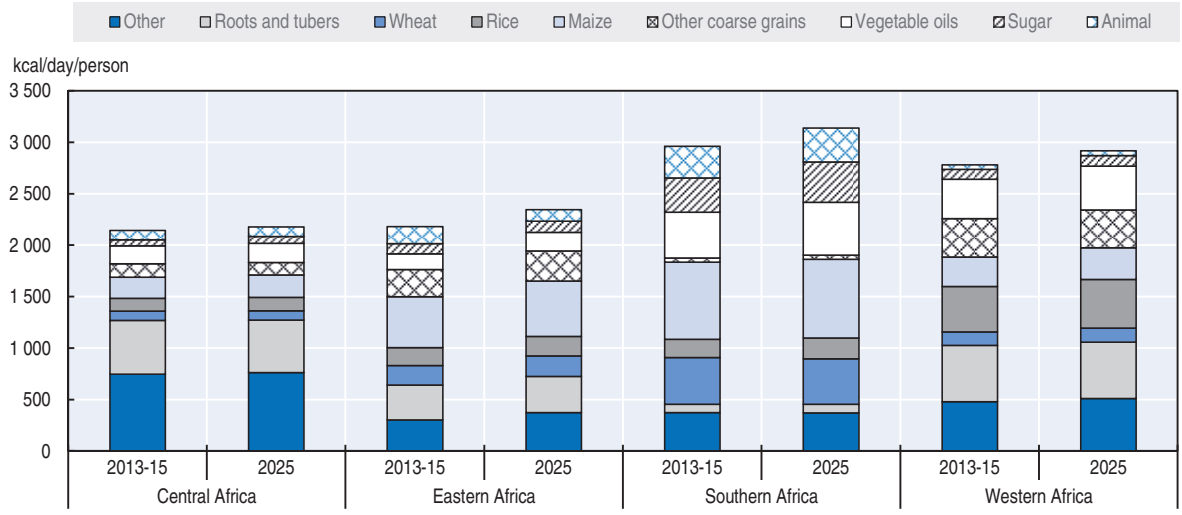
The relative productivity of these medium-scale farmers is less clear. Farm businesses may benefit from increased commercialisation and economies of scale, but speculative land acquisitions by richer, politically influential urban households may not impact on productivity. Increased commercialisation is projected to raise productivity growth, yet a substantial yield gap remains. Accelerated changes to farm structure, accompanied by mechanisation and improved farming practices have the potential to induce a much higher rate of productivity growth.

Medium-term outlook

Focusing on the most food insecure region in the world, key questions for the medium-term outlook relate to growth in caloric intake. Significant expansion in the demand for food products is inflated by population growth, and improvements in per capita caloric intake remain modest. Regional differences are evident both in levels and composition, but the highest growth is achieved in Eastern Africa, where per capita caloric intake expands by almost 7.5% (162 kcal/day/person) by 2025. By contrast, the Central African region, heavily influenced by its two key countries, Angola and the Democratic Republic of the Congo (hereafter "DRC"), increase caloric intake per capita by only 1.5% (32 kcal/day/person) over the ten-year period. This results from rapid population growth in excess of 3.5% in DRC and a reduced income growth outlook in Angola, which relies heavily on crude oil exports. Southern and Western Africa houses the largest economies in the region (South Africa and Nigeria), and therefore unsurprisingly, total caloric intake is almost 40% higher relative to Central and Eastern Africa. Significant diversity is still evident within these regions however and caloric intake in several countries remains low.

As a group, caloric intake in Southern and Western Africa will be 6% (178 kcal/day/person) and 5% (136 kcal/day/person) higher respectively by 2025, with the bulk of the increase coming from vegetable oil and sugar consumption (Figure 2.9).

Figure 2.9. **Caloric intake by commodity group in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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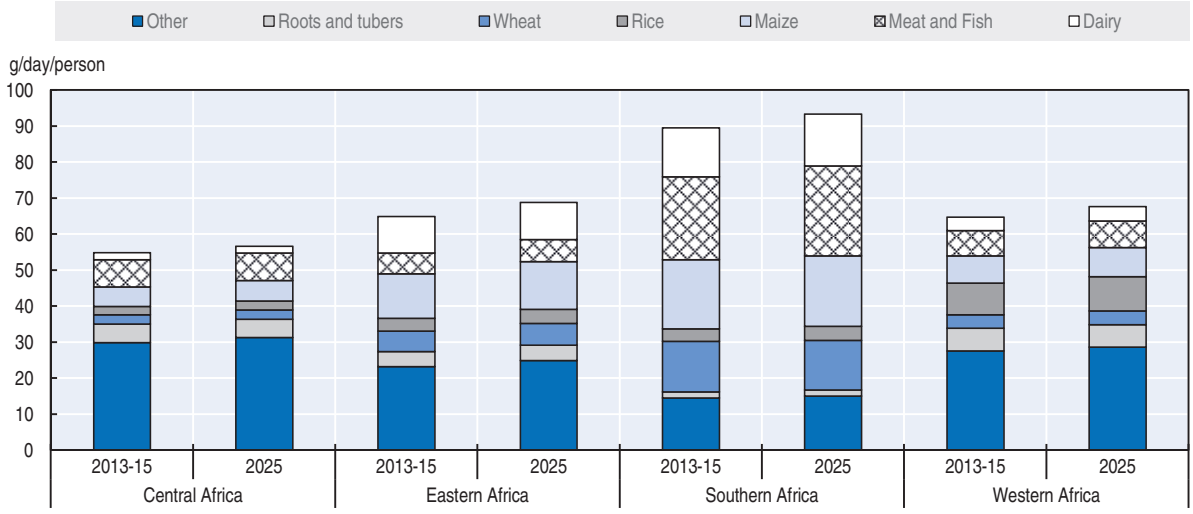
Per Capita protein intake also differs across the region, being almost 65% higher in Southern Africa relative to Central Africa (Figure 2.10). This reflects significantly higher meat consumption in Southern Africa. In line with meat and dairy, per capita protein consumption grows fastest in Eastern Africa, expanding by 6% (4 g/day/person) over the ten year period. In Central Africa, which remains beset by civil conflict, per capita growth is modest at just over 3% (2 g/day/person) for the ten-year period.

Figure 2.10. **Per capita protein consumption by commodity group in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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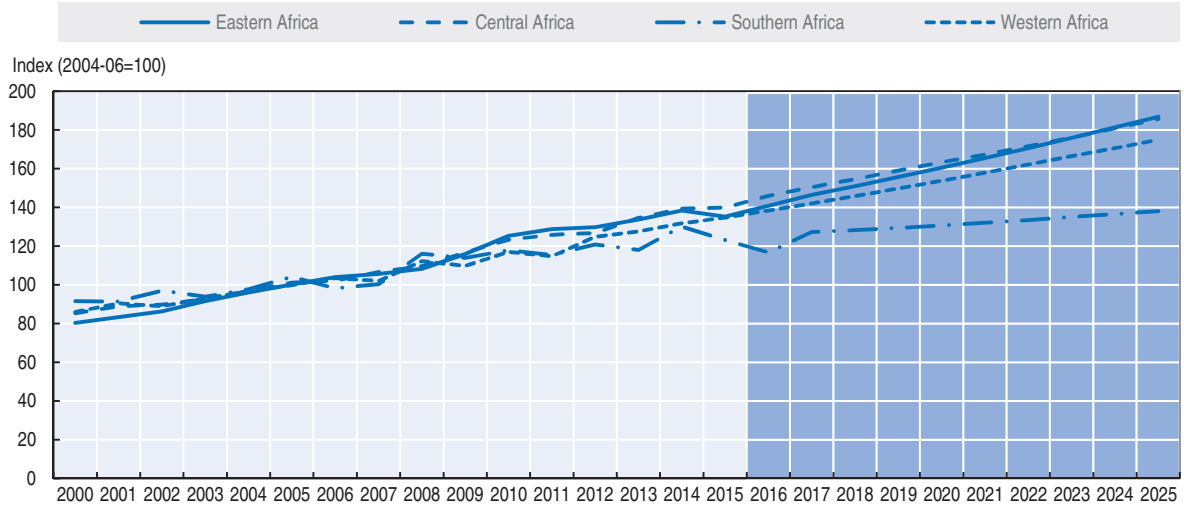
Combined with a rapidly expanding population, modest increases in per capita consumption imply significant demand growth and rising import demand for many commodities. Figure 2.11, which shows indices of the value of agricultural production based on constant 2004-06 US dollar prices and production projections, suggests that production also responds. This response is supported by high prices in the SSA region resulting from both weaker exchange rates and price premiums resulting from domestic market isolation; yet significant differences remain between different sub-regions and commodities. Based on stable yield assumptions, the region remains self-sufficient in key staples such as maize, and roots and tubers, with imports only required in times of drought. By contrast, a significant share of consumption growth for wheat, rice and poultry will be met through imports. At the same time, export industries such as sugar, cotton, fruits and beverages continue to grow, contributing to foreign currency reserves.

Figure 2.11. **Agricultural production index for covered commodities in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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Crops

Following rapid expansion over the past decade, adverse weather conditions across Eastern and Southern Africa reduced cereal output by more than 10% in 2015 (Box 2.3). Production prospects for the 2016 summer crop remain circumspect across Southern Africa in particular and prices have risen sharply in response. Maize prices in South Africa, Zambia and Malawi reached record levels early in 2016 and governments responded by releasing maize to consumers at subsidised prices and limiting export permit allocations.

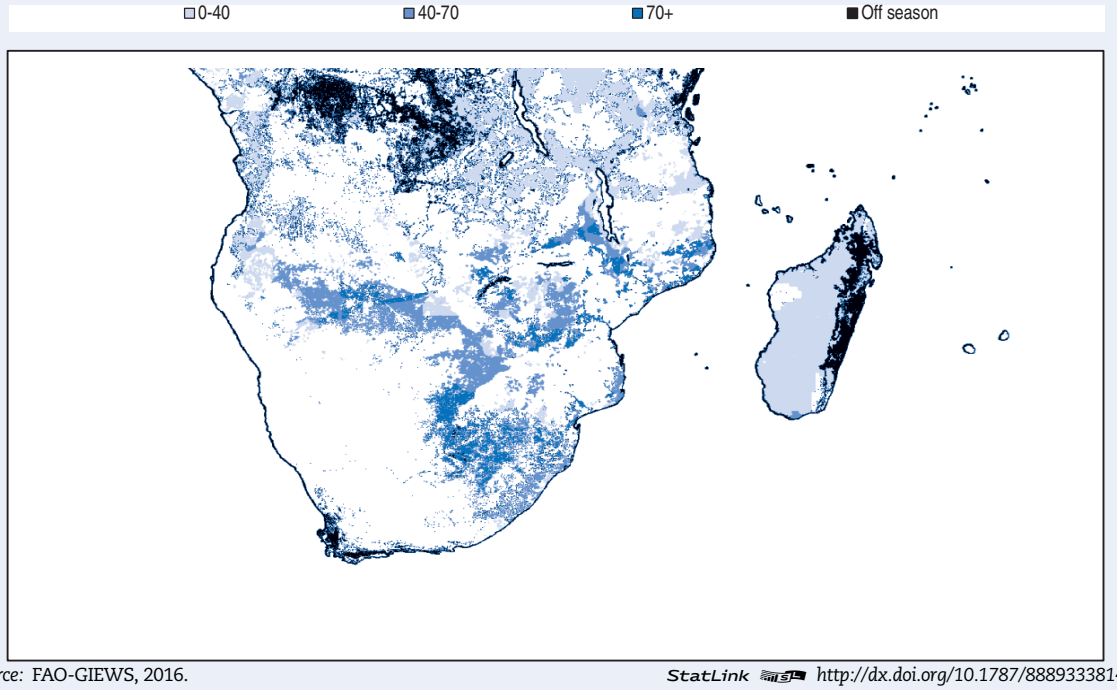
Box 2.3. **Impact of the 2015-16 drought on agricultural production in Eastern and Southern African**

The SSA region has been particularly prone to recurrent drought conditions in the past. Between 1990 and 2013, almost 43% of the drought events recorded in the EM-DAT[1] database occurred in SSA. The impacts of precipitation shortages on agricultural output have been particularly severe, due to the predominance of rain-fed cropping and pasture based livestock systems. Climate projections suggest that rainfall variability is likely to increase in the SSA region over the coming decade, impacting on food security.

Box 2.3. **Impact of the 2015-16 drought on agricultural production in Eastern and Southern African** *(cont.)*

In 2015, the occurrence of a strong *El Niño* episode has been accompanied by exceptionally dry conditions across Eastern and Southern Africa (ESA). Ethiopia recorded the lowest annual rainfall in 30 years in 2015, while the same year represented the lowest annual rainfall since 1904 in South Africa. The monthly distribution of rainfall is an equally important consideration for agricultural production. The limited and uneven distribution of rainfall through the optimal planting period for summer crops (October to December) across the Southern African region had a particularly adverse impact on early crop development, raising food security concerns. The agricultural stress index in Figure 2.12 illustrates the extent of developing crops suffering from water stress as of late December 2015.

Figure 2.12. **Agricultural stress index – December 2015**



Source: FAO-GIEWS, 2016.

StatLink http://dx.doi.org/10.1787/888933381459

Maize is the principal staple in most countries within ESA, hence its availability and affordability have been central to food security in the region. It represents the largest summer crop across most of ESA and provides a livelihood to multitudes of small scale producers. In South Africa and Zambia, the largest surplus producers in the region, initial production estimates reflect a decline of 27% and 21% in the maize crop in early 2016, from an already below average crop in early 2015. Consequently, import volumes across ESA will rise significantly in 2016 and, contrary to historic trends, the bulk will originate from outside the region.

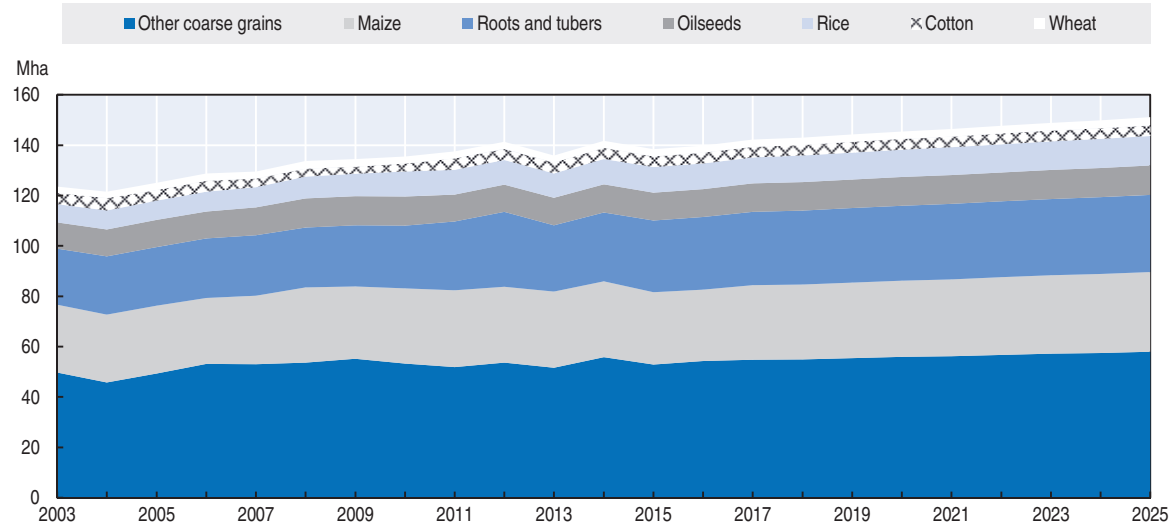
Import bills are rising further as many currencies in the region have devaluated considerably against the US dollar. Furthermore, stringent regulations related to genetically modified (GM) technologies[2], as well as the preference for white maize limits potential procurement options,[3] incurring a substantial price premium over yellow maize, which is more commonly traded in the global market. Maize prices are projected to remain high until March 2017, which represents the first opportunity for early deliveries from within the region to alleviate pressure on low stock levels.

1. International disaster database – Centre for Research on the Epidemiology of Disasters: *www.emdat.be/database*.
2. Regulations related to GM technology vary across the region. The bulk of countries do not accept GM maize, while some countries are able to import it only under specified conditions.
3. There are only a few white maize surplus producers in the world of which Mexico and the US seem to be the only viable sources of white maize for the export market in the current marketing season.

The Zambian Food Reserve Agency stopped exporting its existing stock. Significant imports will be required to ensure short-term food security and in many coastal regions, wheat is being imported at more competitive prices than white maize.

Expansion of total crop area in SSA is projected to slow relative to the past decade due to a lower price environment, combined with the rising cost of bringing additional arable land into production (Figure 2.13). The bulk of additional land is allocated to staple crops such as coarse grains, rice, and roots and tubers, though the rates of expansion vary widely across regions and countries. In Southern Africa for instance, soybeans account for the greatest share of additional area, whereas in Eastern Africa it is coarse grains. In Central and Western Africa, the greatest increase is attributed to rice, and roots and tubers.

Figure 2.13. **Crop area in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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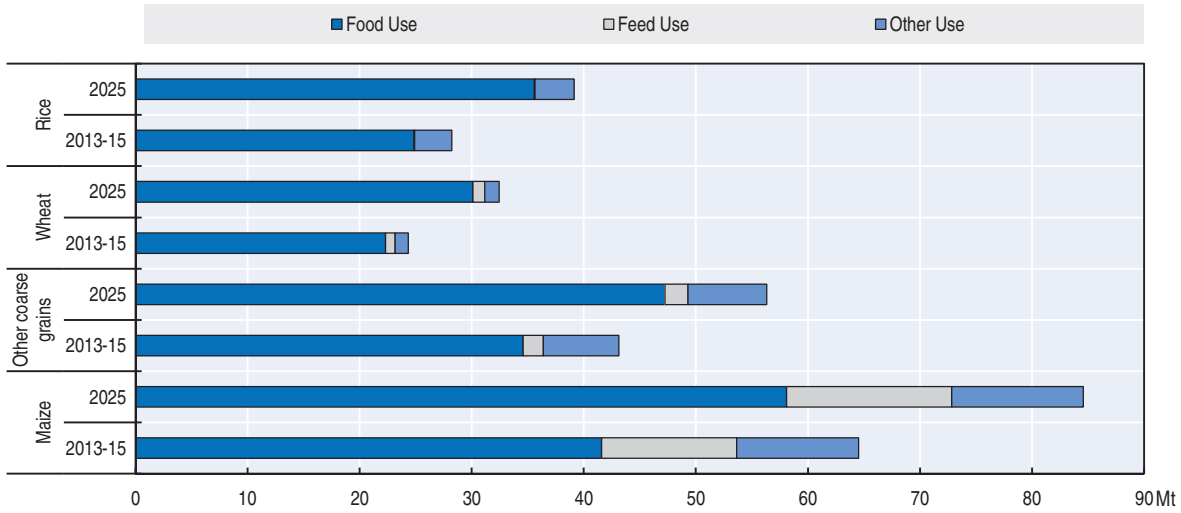
Cereals

Cereals remain the primary source of energy for more than 962 million people across SSA and are therefore critical to food security. The composition of cereal consumption differs from the global norm however in that maize is an important staple for human consumption. Total cereal demand growth slows to 2.7% p.a. over the outlook period from 3.8% p.a. over the past decade; yet by 2025, total consumption will have increased by more than 52 Mt, just over 6kg per capita. By 2025, total cereal consumption will exceed 134 kg per capita, which remains less than 40% of the global average.

Food use continues to drive demand growth for all cereal products (Figure 2.14). Feed use is also an important driver of additional maize demand. By 2025, food consumption accounts for almost 70% of total maize demand, with an even higher share for other coarse grains, wheat and rice. Maize continues to dominate the cereal market, accounting for almost 40% of total cereal consumption by 2025, followed by other coarse grains (27%), rice (18%) and wheat (15%). In line with unique historic preferences, consumption growth differs by region, however, and while maize accounts for the largest share of additional cereal demand in Southern, Eastern and Central Africa, demand growth for rice exceeds any other cereal in West Africa.

Figure 2.14. **Cereal demand composition in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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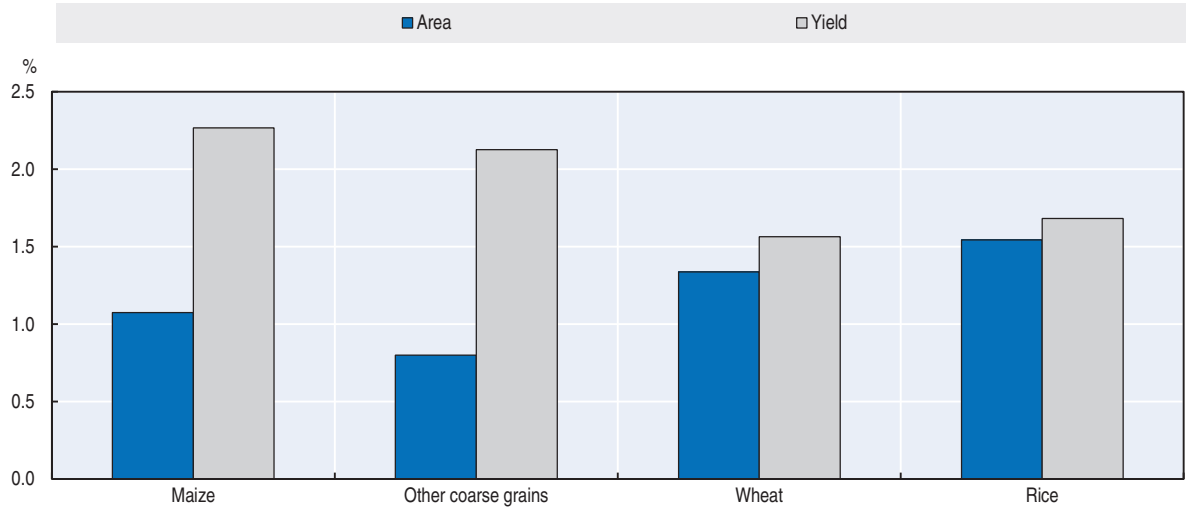
Cereal production is projected to expand by 3.2% p.a. by 2025, rising by more than 41 Mt relative to the 2013-15 base period. Coarse grains account for the bulk of the expansion, with maize and other coarse grains contributing more than 80% of additional cereal production between them. Contrary to the past decade, when rising production resulted from area expansion, the role of productivity growth is expected to increase. Regional differences exist, but total area cultivated to cereals expands by about 1% p.a. over the coming decade, whereas yields improve by an annual average of just under 2% (Figure 2.15). With a few exceptions, fertiliser use remains well below global norms; SSA applies less than 20% of the fertiliser usage per hectare in the United States or India, suggesting that it could increase usage to support further yield growth. Yield growth could also be supported by the development of irrigation and the use of advanced seeds. Meaningful increases in fertiliser usage will however depend on resource availability, as well as the extent to which infrastructural development improves distribution to increase accessibility and reduce costs.

Maize production growth remains centred in a few countries; Eastern Africa will account for more than 50% of the additional 19 Mt of maize produced in SSA by 2025, and six countries together contribute more than 60% of the additional production (Figure 2.16). The relative contribution of land to production growth differs widely across the region, though robust yield growth of more than 1.8% p.a. is projected in all six countries. In South Africa, yield growth is sufficient to support higher production despite declining area, whereas in Ethiopia, significant expansion is evident in both area and yields. Albeit from a smaller base, production growth in Zambia and Uganda exceeds 40% over the outlook period, underpinned by continued area expansion coupled with yield improvements. Supported by input support programmes that enhance the accessibility of modern inputs to multitudes of small-scale producers, both countries produce a rising exportable surplus over the ten-year period.

Growth in production of other coarse grains is concentrated in Eastern and Western Africa, where sorghum and millet are popular within the cereal consumption basket. Between them, Eastern and Western Africa constitute more than 90% of production

Figure 2.15. **Change in area and yield for cereals in Sub-Saharan Africa**

Annual growth between 2016 and 2025



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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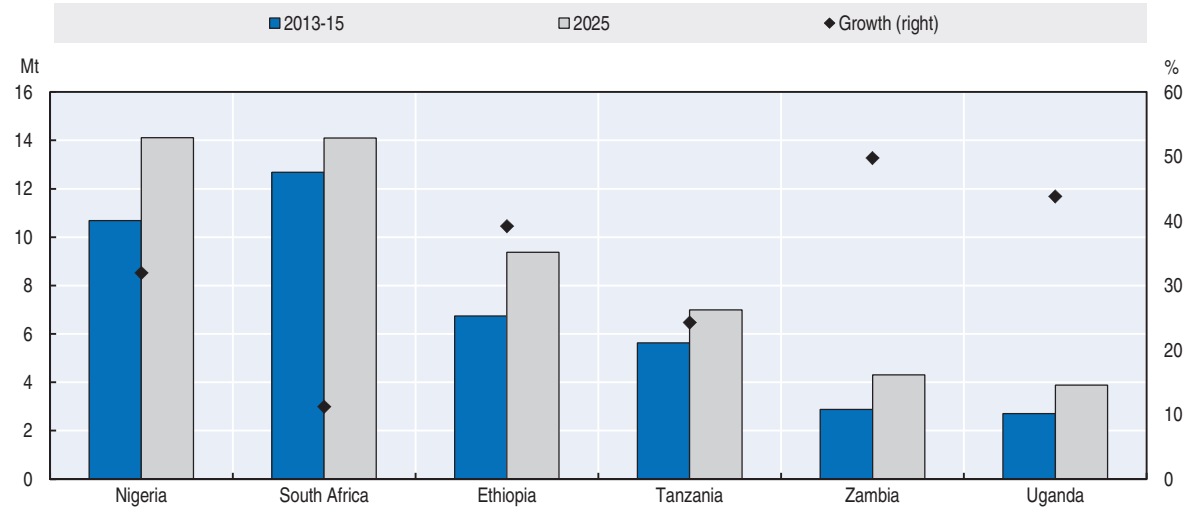
Figure 2.16. **Maize production in selected Sub-Saharan African countries**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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growth. Ethiopia alone accounts for almost 40% of additional production to 2025, followed by Nigeria (14%) and Sudan (10%). Significant yield improvements are projected in all three countries, but the sharp production increase in Ethiopia and Sudan is further supported by area expansion of 18% and 22% respectively by 2025.

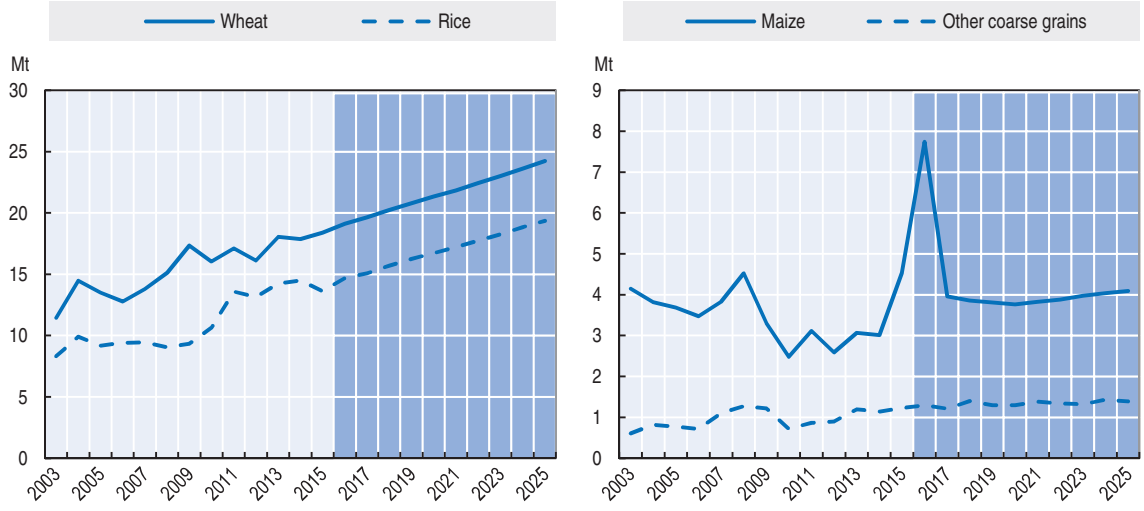
Less than 3% of global rice is produced in SSA, but at 6% p.a., its production has expanded faster than any other cereal over the past decade. Favourable storage characteristics, ease of preparation and versatility in consumption make rice a popular choice among consumers and by 2025, SSA will produce more than 20 Mt. The five biggest producers (Nigeria, Madagascar, Mali, Tanzania and Guinea) account for almost 65% of production growth. Area expands in all five countries, yet focused efforts by the African

Rice Centre and the International Rice Research Institute, combined with the adoption of improved varieties, such as locally developed New Rice for Africa cultivars also support yield growth.

From a production perspective, wheat is the smallest of the cereal markets in SSA, contributing only 5% of total cereal production in 2015. Few countries are endowed with the biophysical attributes for competitive wheat production and in the base period (2013-15), four countries accounted for more than 90% of the region's wheat production with Ethiopia accounting for more than 70%. The bulk of production growth is also attributed to these countries, with Ethiopia, South Africa, Sudan and Kenya expanding production by 4% p.a., 1.3% p.a., 1.9% p.a. and 2.4% p.a. respectively. Production growth results from area and yield expansion, except for South Africa, where the area of wheat is projected to decline marginally. This follows a long-term trend of declining wheat area in South Africa (particularly the Free State province) following the deregulation of agricultural markets. The sharp decline in area was offset by yield gains and over the Outlook, both the area decline and yield gains are projected to slow.

Despite impressive production growth, demand is such that cereal imports continue rising and by 2025 exceed 49 Mt – growing 2.2% p.a. In line with past trends, wheat and rice contribute the bulk of additional cereal imports, with coarse grains representing only 6% of the total growth. Wheat and rice imports expand by an annual average of 2.7% and 3.3% respectively. Imports are concentrated in a few countries; Sudan and Nigeria account for more than 20% of wheat and rice imports respectively. Within these products, all countries in the region remain in deficit and with few exceptions for rice, net imports rise across the region over the coming decade (Figure 2.17).

Figure 2.17. **Cereal imports into Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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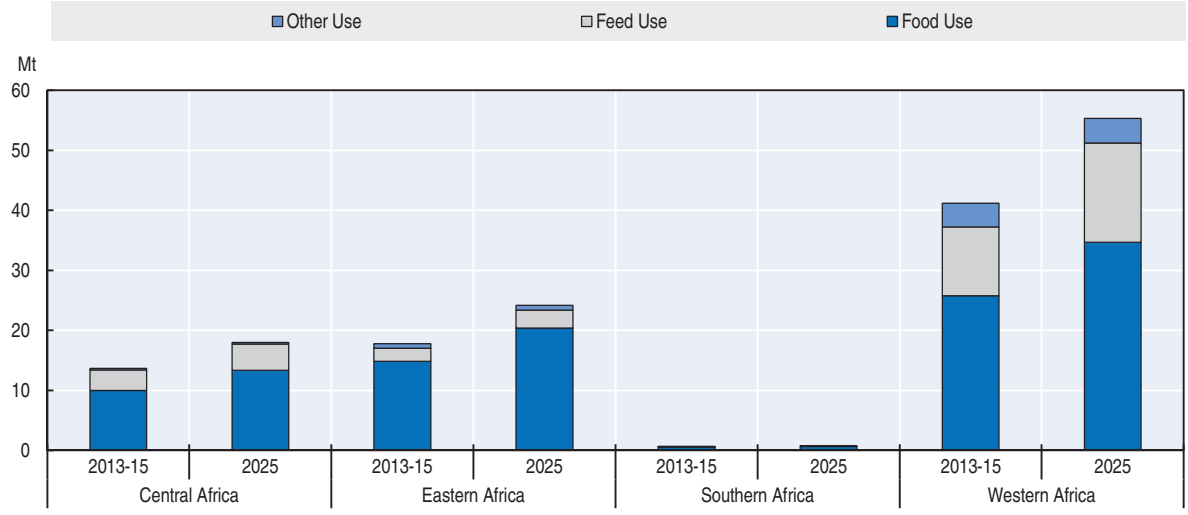
The SSA region is a surplus coarse grain producer, and while the size of the surplus is projected to fall by 2025, the trade balance for both maize and other coarse grains remains positive. Contrary to wheat and rice imports, maize trade is predominantly intra-regional. Traditional surplus producers such as South Africa, Zambia and Ethiopia continue to account for the greatest share of export growth, while Kenya and Zimbabwe remain the

largest deficit markets (Box 2.2). In South Africa, trade into the SSA region is projected to decline, as continued demand growth from the animal feed market supports a shift in production from white to yellow maize, resulting in surpluses of yellow maize entering the global market as opposed to the rest of the SSA region.

Roots and tubers

As an affordable and nutritionally rich staple, roots and tubers are an important constituent of SSA diets, particularly in Central and Western Africa, where per capita consumption exceeds any cereal product. Preferences differ regionally, but food consumption remains the primary component of total demand and products are sometimes blended with other imported staples such as wheat flour to curtail high food costs. Having surpassed 65 kg per capita, almost double the global average, per capita consumption in Central and Western Africa stagnates over the projection period but growth on a per capita basis occurs in Eastern Africa (Figure 2.18). Accounting for population growth however still results in robust expansion of total demand in SSA as a whole, approaching 100 Mt (55 kg per capita) by 2025. Of the additional 18 Mt consumed by 2025, almost 9 Mt is attributed to Western Africa, reflecting an average annual growth rate of 2.6%, compared to 2.4% and 2.8% in Central and Eastern Africa respectively.

Figure 2.18. **Roots and tubers consumption in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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Adaptation to marginal environments and flexibility in mixed farming systems allows roots and tubers to make a meaningful contribution to household food security and income levels, particularly for the rural poor. Given their perishable nature, trade represents a very small share of the market and production concentrated in Western Africa reflects consumption preferences. Nigeria alone accounts for more than 37% of production growth over the projection period, owing to yield gains that accelerate from the past decade. Different approaches have been developed to improve production technology for small scale producers and yield growth is supported by international partnerships designed to improve the adoption of new varieties.

Oilseeds and oilseed products

In line with global trends, oilseed production in SSA has expanded rapidly over the past decade, but was concentrated in a few countries. Soybean production soared by just over 1 Mt, yet almost 90% of the additional area was in South Africa, implying a total expansion of just over 0.1 Mt across the rest of SSA. Similarly almost 75% of other oilseed production growth is attributed to Nigeria, South Africa and Senegal. Oilseed production across SSA is projected to expand by an annual average of 2.3% p.a. to exceed 11 Mt by 2025, only 2% of global production.

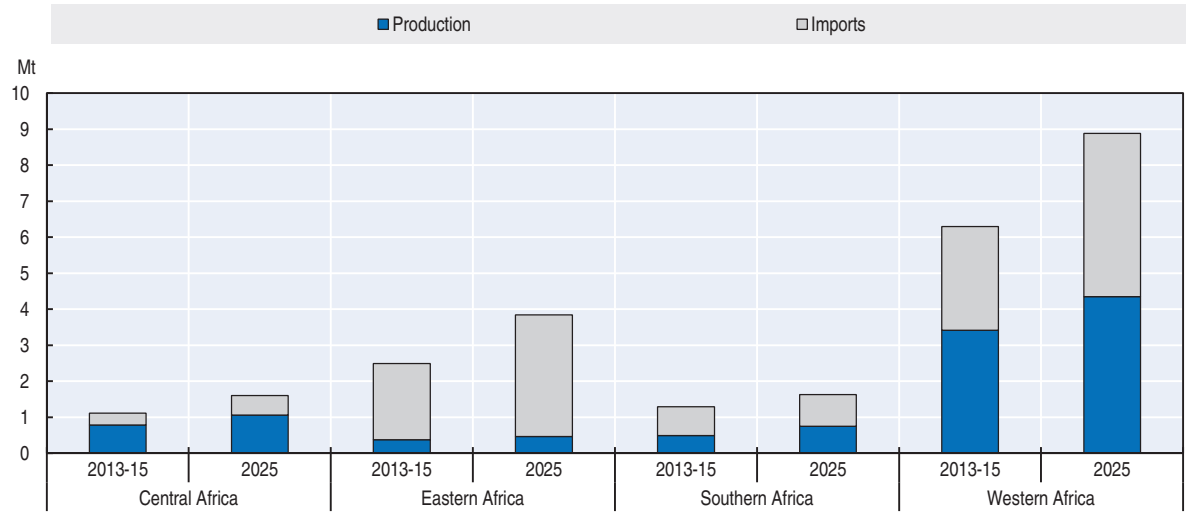
In soybean production, South Africa stands in stark contrast to the rest of the region. Underpinned by a tripling of area and continuous yield improvements, soybean production expanded fivefold to exceed 1 Mt by 2015 from only 0.2 Mt between 2003 and 2005. Supported by rising demand from the animal feed sector, crushing capacity has expanded rapidly over the past few years, but soybean production failed to keep up. Thus South Africa moved from a traditional net exporter to a net importer from 2014. Sustained production growth of 7% p.a. is projected to 2025. As livestock production intensifies, crushing demand may also increase across the rest of the region. For instance in Zambia, soybean production is projected to expand by an annual average of more than 5% to 2025, albeit from a small base.

Other oilseed production is concentrated in the Western African region, with Nigeria alone producing 30% of the SSA total. Western Africa also accounts for more than half of projected production growth, however growth rates are more consistent across the region than for soybeans. The performance of selected countries illustrates that significant production growth is possible, but productivity remains very low by global standards leaving significant room for improvement. Meaningful expansion will also be dependent on the development and expansion of processing facilities.

SSA accounted for less than 2% of global protein meal consumption over the 2013-15 base period, reflecting the extensive nature of livestock production across most of the region. Protein meal use has expanded by more than 40% over the past decade, yet it remains concentrated in South Africa and Nigeria, which account for almost 60% of total use. As livestock sectors intensify in the coming years, protein meal use expands across most of SSA, with the fastest growth recorded in Western Africa (43%) and Eastern Africa (32%). In Southern Africa, projected growth is more modest at 16%, yet the base is much higher and in absolute volumes, Southern Africa accounts for the greatest share of additional protein meal use. The share of imports in total consumption declines marginally, mainly as a result of increased crushing volumes and reduced imports in South Africa.

Vegetable oil consumption in SSA has grown consistently over the past decade, yet at 11 kg per capita consumption remains well below the global average. Growth of 2.1% p.a. in per capita consumption makes it one of the fastest growing commodities in the region over the past decade. Growth is projected to be sustained, with Southern (1.4% p.a.) and Eastern Africa (1.2% p.a.) expanding the fastest to 2025. Given the limited oilseed processing facilities, imports comprise a substantial share of total consumption at more than 50% in Eastern and Southern Africa in the base period. High transportation rates therefore raise the cost of vegetable oil. Nonetheless, total imports into SSA are projected to expand by an annual average of 3.7%, of which Nigeria (4% p.a.), Sudan (5% p.a.), Ethiopia (6% p.a.) and Kenya (3% p.a.) account for the greatest share. Consequently the contribution of imports in total consumption in Eastern Africa increases further to almost 90% (Figure 2.19).

Figure 2.19. **Vegetable oil consumption in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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Pulses

Pulses offer tremendous potential to alleviate malnutrition in SSA and its contribution to total protein intake is higher than in any other region in the world (Box 2.4). Per capita consumption remains well above the global average of 6.9 kg per capita in Central (10 kg), Eastern (22 kg) and Western Africa (17 kg), growth in per capita consumption of 2.5% p.a. (2.6 kg) over the past decade is sustained to 2025 and growth exceeds 2.5 kg per capita in all regions except Southern Africa, where consumption is already low in the base period.

Between 2013 and 2015, more than 50% of production originated in Eastern Africa, which also accounts for more than 65% of the additional 9.8 Mt produced across SSA by 2025. The popularity of pulses in SSA rests in their low input cost arising from the success of farm saved seeds, as well as their favourable impact on soil quality when planted alongside or in rotation with other crops such as maize.

Box 2.4. **2016 International year of pulses**

Pulses[1] have been an essential part of human nutrition for centuries and continue to be a major protein source and staple food in both developed and developing countries. Being dried seeds they can be stored for long periods without losing their nutritional value, allowing for flexibility and increased food availability between harvests. Crop residues can also be potentially used as feed and the heightened protein concentration from these are known to improve animal health.

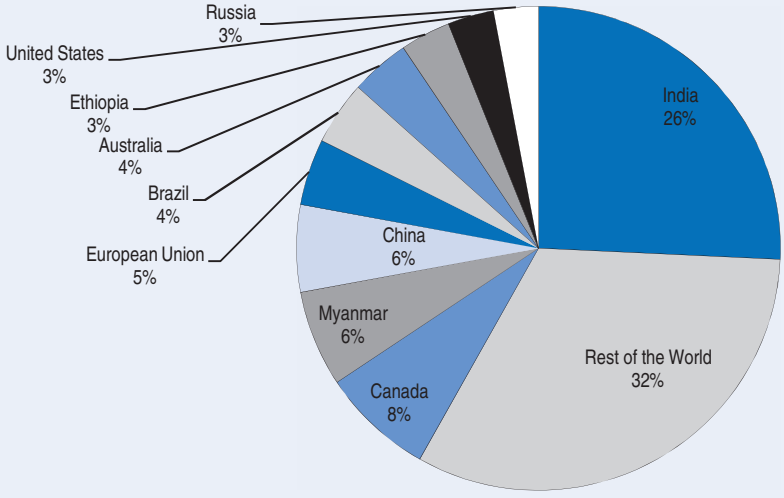
Pulses are an increasingly important crop for smallholder farmers in a number of developing countries. The harvest can be consumed by the family or sold providing additional income. Being labour intensive, they provide employment opportunities both in the farm, during their cultivation, and off-farm through their processing. They have a lower carbon footprint than almost any other food group and have the ability of nitrogen fixation in crop rotation. Locally adapted pulses are drought-resistant and can be cultivated in very poor soils and semi-arid environments stabilising the food security situation in dry environments.

Box 2.4. **2016 International year of pulses** *(cont.)*

Canada is likely to continue being the world's leading exporter, shipping around 6 Mt of pulses (primarily dry peas) with a production of 5.8 Mt in 2015-16 expected to reach 7.2 Mt in 2016-17, followed by Australia, Myanmar, the United States and China. India is the world's leading importer, other significant importers include the European Union, China, Bangladesh and Pakistan.

India, where pulses are a significant source of protein for the poor as well as for vegetarians that constitute the majority of the population, is the largest consumer. The second largest being China which, together with India, accounts for almost half of world consumption. India has been the top producer for the past 30 years, accounting for a quarter of world production (20 Mt). Pulses production is a policy driven market and domestic grains policies in both India and China could have impact on the world market.

Figure 2.20. **World production of pulses in 2014 by region**



Source: FAOSTAT (2016). FAO, *http://faostat3.fao.org/*.

StatLink http://dx.doi.org/10.1787/888933381538

In general, consumption has seen a slow but steady decline. In addition to shifting diets in many countries, this may be partially due to an inability for production to keep pace with a growing population. Standard crop improvement methods complimented with modern biotechnology tools and genetic engineering are expected to play an important role in the generation of higher yields. The availability of innovations in developing countries will depend on continued significant levels of investments in agricultural research, both at the international and the national levels.

1. The term is limited to crops harvested solely for dry grain, thereby excluding crops harvested green for food (green peas, green beans, etc.) which are classified as vegetable crops. They include bambara beans, broad beans, chickpeas, cowpeas, dry beans, dry peas, lentils, lupines and vetches. For more detailed information on the International Year of Pulses please refer to the United Nations website *http://iyp2016.org/*.

Cotton

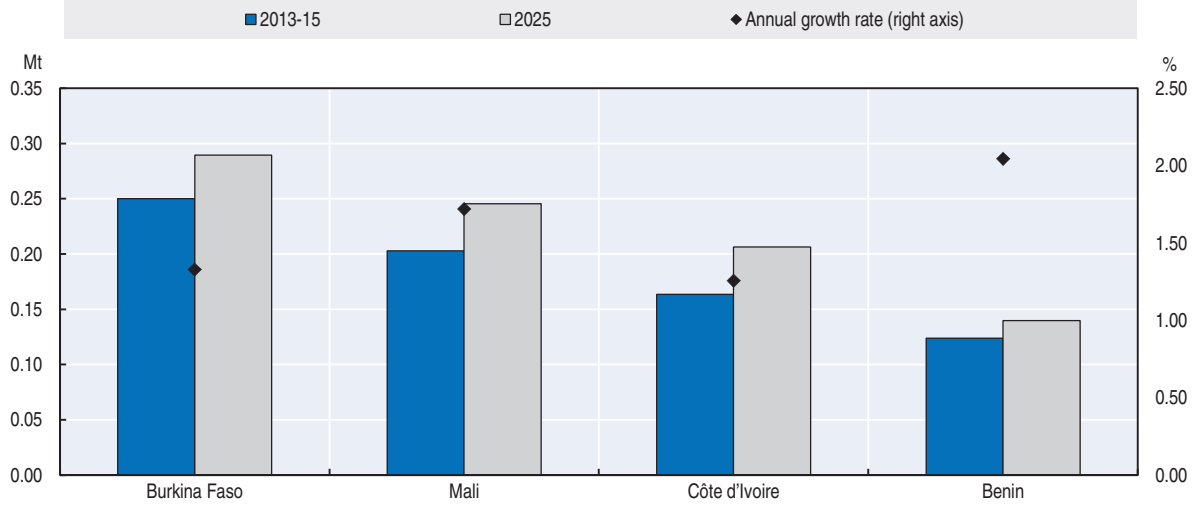
Cotton has emerged as an important cash crop in SSA, despite its small share in global production of 5.5%. Produced mainly for the export market, it has provided smallholder producers with a means to overcome input accessibility constraints through contract farming, playing a critical role in poverty alleviation in rural areas. The lower prices of man-made fibres, driven by substantially lower oil prices, have placed huge competitive pressures on world cotton markets in recent years. Despite potential opportunities for

additional employment in downstream activities such as spinning and apparel, domestic use has declined over the past decade. Despite a partial recovery over the past five years, consumption remains well below the levels observed in the early 1990s and constituted less than 15% of production from 2013 to 2015. Consequently, cotton lint exports have gained increasing importance and the SSA share of global exports has grown to 15%. Given export orientated production, producer income remains sensitive to relative exchange rates as well as subsidised production in other areas of the world.

Production is concentrated in Western Africa, which accounts for more than 60% of the SSA total and where it is second only to cocoa beans in its contribution to agricultural export earnings. Despite a marginal decline in area, SSA production is projected to expand by 14%, surpassing 1.5 Mt by 2025. Production and export growth remains centred in four Western African countries that historically account for more than 55% of SSA production (Figure 2.21).

Despite revived domestic demand growth over the coming decade, 89% of SSA production will be exported by 2025. Export growth exceeds 1.7% p.a. in both Mali and Benin (Figure 2.21), though the sector continues to be challenged by infrastructural constraints; in particular in landlocked countries, where the time required to clear land borders creates bottlenecks that delay shipments. The value generated by cotton exports could therefore be increased if such challenges can be overcome.

Figure 2.21. **Cotton exports from selected countries in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en*.

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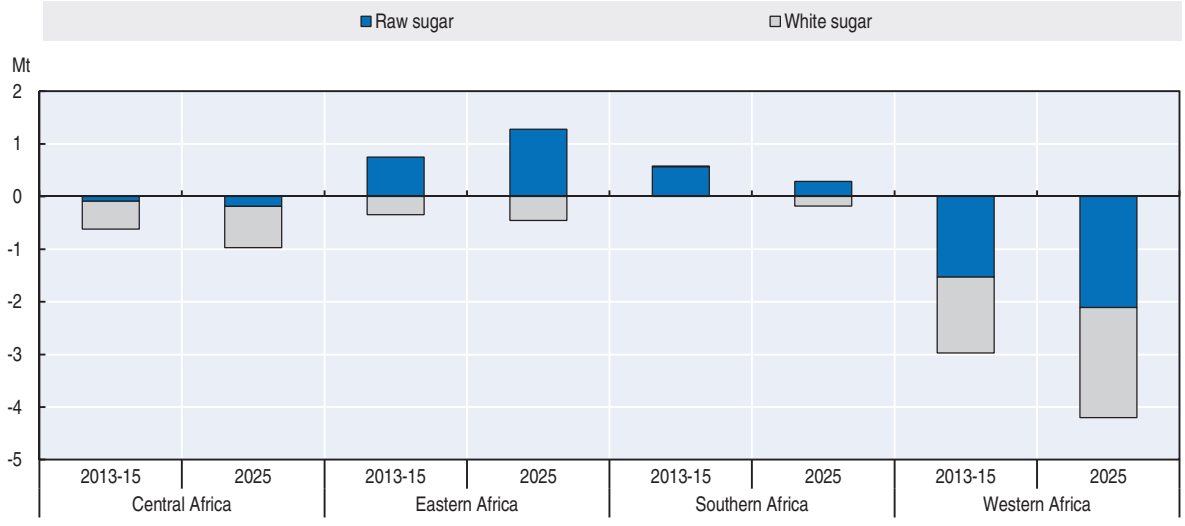
Sugar

Sugar generally represents a success story within SSA agriculture. At an aggregate level, SSA is a net importer, yet several countries in Eastern and Southern Africa rank among the lower cost producers in the world and export consistently. Least Developed Countries in SSA have benefited from quotas providing preferential access to a lucrative sugar market in the European Union, supporting production growth over the past decade. Swaziland, Mauritius, Mozambique, Zambia, Malawi and Zimbabwe have all exported successfully to the European Union. Significant reforms to EU sugar policy however have

presented an uncertain future for such exports. High transportation costs raise the cost of exports from landlocked countries and the expected reduction in EU prices following the reforms will likely shift exports away from the European Union into the SSA region.

Sugar consumption in SSA remains low in the global context and the average per capita consumption between 2013 and 2015 was only half the world average. Import demand from Western Africa in particular remains strong however (Figure 2.22) and is projected to expand by a further 34% over the next ten years relative to the 2013-15 base period. Consumption growth in Eastern and Southern Africa is also projected to expand by more than 2% p.a. and while import demand expands significantly in both Kenya and Tanzania towards 2025, production within Eastern and Southern Africa is sufficient for deficits to be met from neighbouring countries. Thus both regions retain a positive trade balance. In Eastern Africa in particular, raw sugar exports are complimented by refined sugar imports (Figure 2.22), suggesting that preferential access to the EU market has rendered raw sugar exports more profitable than domestic refinement.

Figure 2.22. **Net trade of sugar in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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Sugarcane production in SSA is projected to expand by approximately 1.7% p.a. over the coming decade, mainly from Eastern Africa, where Kenya and Mozambique register significant growth. Expansion is much slower in Southern Africa however, at only 0.2% p.a. for the ten-year period. South Africa is the largest sugar producer in SSA and its sugar area in excess of 300 kha is more than double that of any other country in the region. Not unlike many other countries, the sugar sector remains highly regulated. Despite its utilisation of a single channel marketing system, the South African sugar industry has struggled to come to terms with tighter profit margins, mainly due to stagnant and in some areas declining yields, combined with rising input and labour costs, and agrarian reform. Area under sugarcane has consolidated as a result and, exacerbated by drought conditions in 2015, exports have halved over the past decade. A substantial share of exports from Swaziland are already directed at the South African market, however reductions in exports to

the European Union will likely increase the volumes flowing into South Africa from the rest of the region.

SSA possesses significant growth potential for sugar, but realisation of that potential will depend on the extent to which exports traditionally destined for the European Union can be absorbed within the region. Current import levels suggest that market space exists, yet trade diversion is hampered by excessive transportation rates. Opportunities for improved market access such as the EAC-COMESA-SADC tripartite free trade agreement will benefit surplus producers, though alternative domestic uses such as bioethanol production and cogeneration of electricity also provides possibilities for additional demand growth. Such ventures will however require a consistent regulatory framework related to their production.

Biofuels

The biofuel industry is small in SSA, comprising less than 1% of the global market. Several governments, however, have supported biofuel initiatives as a means of boosting economic growth and rural development. In many landlocked countries that rely on imported fossil fuels, biofuels have been promoted as a means towards increased energy security. Consequently many countries have introduced mandatory blending rates of varying levels. In addition some export oriented biofuel facilities have been built. Albeit from a small base, ethanol production has expanded by more than 90% over the past decade, with further growth of more than 3% p.a. projected to 2025. Production growth is concentrated in Southern and Western Africa, where it expands by 7% p.a.

Sugar provides the main feedstock for ethanol production, with some production also coming from sorghum. The use of food staple crops such as maize is uncommon and in many cases prohibited. Biodiesel production is a smaller industry than ethanol and over the past decade, production was only recorded in three countries across SSA – South Africa, Mozambique and Tanzania. Jatropha was long promoted as a crop with significant potential for biofuel production, yet it has not delivered the promised yields under adverse growing conditions and more recent studies have questioned its viability in semi-arid conditions due to high water requirements. Therefore the bulk of biodiesel expansion over the *Outlook* originates from South Africa, given the domestic biofuel program. Production is mainly from vegetable oil, but volumes remain small and, given that South Africa is still a net importer of vegetable oils, large scale expansion seems unlikely.

Meat and eggs

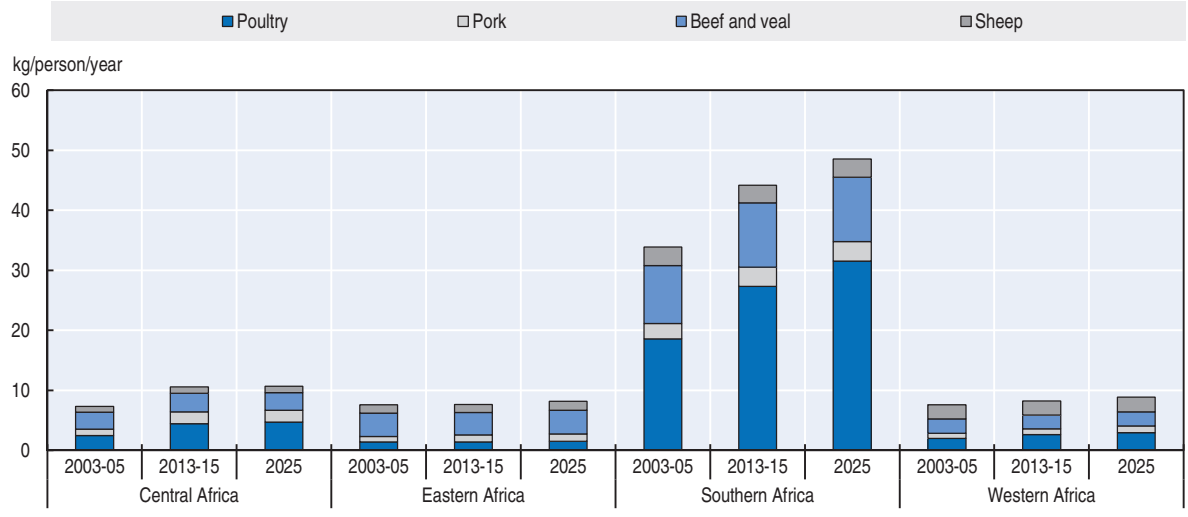
Per capita meat consumption in SSA at only 11 kg p.a. remains less than a third of the global average, yet significant regional differences are evident both in levels and composition (Figure 2.23). Meat consumption in Southern Africa is four times higher than any other region and while this is heavily influenced by South Africa, consumption in countries such as Namibia and Botswana is also well above the SSA average. Accounting for population however results in higher total meat consumption in Eastern and Western Africa, which together account for 54% of SSA meat consumption.

Notwithstanding the small base, the projected expansion of 35% in total meat consumption by 2025 outpaces any other region in the world. Underpinned by rising incomes, urbanisation and sustained population growth, robust consumption growth is projected across most of SSA, with an expansion of more than 38% evident in Central, Western and Eastern Africa. Slower growth of 20% in Southern Africa reflects a slowdown

in South Africa, where per capita consumption has already surpassed 45 kg (Figure 2.23). Egg consumption provides an important alternative that reflects consumption growth of 36% over the ten year period. Consumption growth is also robust across the region and exceeds 50% in Eastern Africa.

Meat consumption preferences are somewhat unique in the region. Poultry accounts for 36% of total meat consumption between 2013 and 2015, but beef (33%) and sheep (19%) contributes a much greater share relative to the global average. This comes at the expense of pork consumption, which is significantly lower at 12%. Consumption preferences reflect cultural and religious preferences, as well as the dominance of extensive, pasture based production systems, with cattle grazing on communal pasture a common occurrence. Relative shares of different meats in the consumption basket remain fairly constant to 2025.

Figure 2.23. **Meat consumption in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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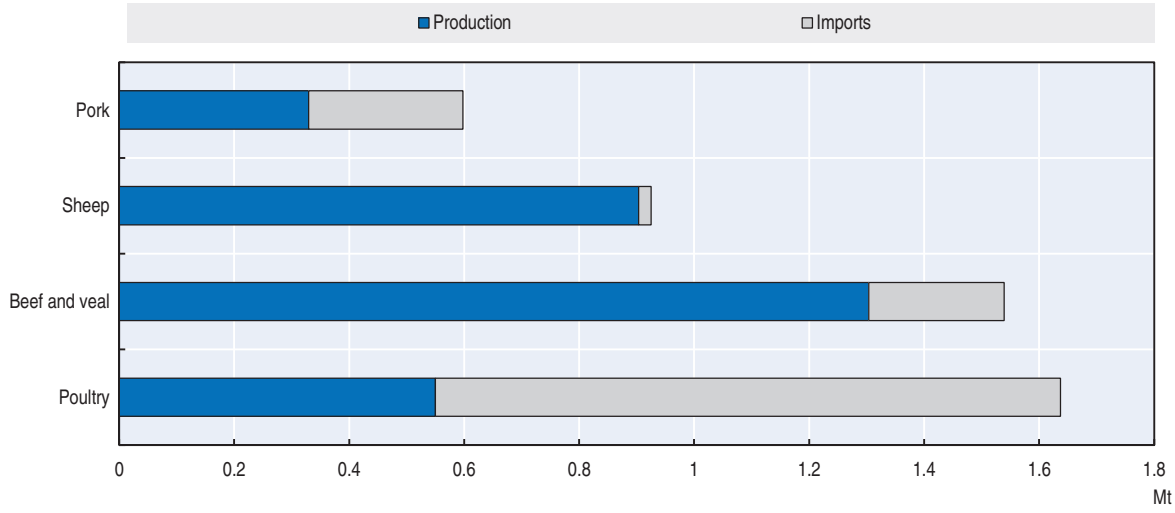
Poultry consumption has expanded faster than consumption of any other meat in the past and with domestic supply unable to match demand, almost 40% of the additional consumption was imported. The preference for "dark" meat, which is less popular in many surplus production regions, has allowed imports to land at very competitive prices and volumes increased by an annual average of 13% over the past decade. Consumption growth in the largest importing countries such as South Africa and Angola is projected to slow, hence the rate of import growth reduces to 5% p.a. to 2025. South Africa is the biggest poultry producer in the region by some distance and is also responsible for the largest share of the 19% increase in production by 2025. This growth remains well below demand and more than half of the additional poultry consumed across SSA by 2025 will be imported (Figure 2.24).

Having expanded by close to 4% p.a. over the past decade, egg production in SSA increases by a further 750 kt by 2025, a rate of almost 3% p.a. Particularly strong growth is projected in Eastern (4% p.a.) and Western Africa (3% p.a.), which account for more than 70% of SSA egg production in 2025.

Figure 2.24. **Growth in meat demand in Sub-Saharan Africa**

2025 vs. 2013-15



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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Abundant grazing resources make extensive beef production an attractive prospect in SSA and in Southern Africa also an important export product, particularly given preferential access of Botswana and Namibia to the lucrative EU market. SSA is resident to 18% of the global bovine herd and consequently a great share of consumption is produced domestically. Growing herd numbers expanded beef production by almost 2% p.a. over the past decade despite the relative prevalence of disease outbreaks. Meat production per livestock unit remains well below the global average, suggesting that significant productivity gains could be achieved. Cattle also represent an important source of wealth in the region and many are kept for purposes other than beef production. Thus production per livestock unit is projected to rise only marginally in the coming decade and the bulk of the 27% increase in beef production is attributed to further herd expansion. Beef consumption growth is strong across the region, expanding by 2.6% p.a. to 2025. Growth is particularly strong in Eastern and Western Africa, where rates exceed 4% p.a. Within these regions, consumption growth is mainly driven by Kenya, Tanzania, Ethiopia, Zambia and Nigeria, all of which increase consumption by an annual average of at least 3%.

Sheep and pork consumption are much smaller in absolute terms, yet both industries grew impressively over the past decade. Growth in sheep meat consumption is sustained at a similar rate over the *Outlook*, while pork consumption slows from recent years. Pork consumption growth is robust across the region, but production does not respond sufficiently to meet demand and almost 45% of additional pork consumption will be imported. By contrast, sheep meat imports account for a very small share of additional consumption. Growth is significantly faster in Eastern Africa relative to the rest of SSA, where it is produced in an extensive, pasture based system. Eastern African production is centred in Sudan and Ethiopia, while Western African production is predominantly from Nigeria and Mali.

Fish

Fish and fishery products play an important role in food security in SSA, representing a valuable source of nutrients for healthy and diversified diets. Average per capita fish consumption in SSA is among the lowest in the world (8-9 kg vs. 19-20 kg of the world level), but the contribution of fish to animal protein intake is higher than the world average (over 20% compared to 17% at world level) and this share exceeds 50% in countries such as the Gambia, Ghana, Senegal and Sierra Leone. Projections reflect a 36% increase of food fish supply by 2025 compared to the average 2013-15 level, but accounting for significant population growth, the per capita increase is a mere 3%. Domestic supply is insufficient to meet demand and imports are expected to constitute an important share of the food fish supply, increasing by 32% in 2025 compared to the 2013-15 level.

Capture fisheries in SSA represents about 7% of world production, and about 40% of its harvest is within inland waters, of particular relevance in selected landlocked countries. Capture fisheries remain affected by the open access character of SSA fisheries. Many countries have focused more on production and revenue maximisation rather than sustainable management of resource productivity. This has caused over-exploitation of some valuable species, changes in the fish species composition and overall oscillation in catches by some countries in recent years. Together with weak monitoring capacity in many countries, these factors have increased the incidences of Illegal Unregulated and Unreported (IUU) fishing activities. The role of foreign fishing vessels, which fish in several coastal waters of the region, often under foreign access agreement, is also noteworthy, as it has reduced benefits for resource-adjacent countries, due largely to poor or weak negotiations of terms of agreement. The increasing adoption of more conservative management measures by some countries, including improved access control (e.g. registration, licensing systems) are expected to increase total capture fisheries production by 15% by the end of next decade compared to the 2013-15 average level.

Aquaculture has been introduced to most countries in SSA, though the region currently produces only 1% of the world's farmed fish. In the last few decades, its slow pace has frustrated the attempts of internal development agencies, governments and private sector investors. Yet in the long run, the enormous potential of aquaculture is still widely acknowledged as important to overcoming food security and nutrition challenges of the region. While challenges remain, prospects appear to be improving in a number of countries. Coupled with the spread of improved farming techniques and facilities, growth has been encouraging in many locations. Appropriate policies by some governments have allowed the private sector to lead aquaculture development, resulting in the emergence and intensification of small-scale and medium-size enterprises, market-led and large-scale commercial initiatives. More substantial regional growth is expected in the coming years, with overall production growing by 84% in 2025 compared to the average 2013-15 level. Aquaculture has already increased its share in total fisheries production in SSA from only 1% in 2004 to 8% in 2014. It is estimated that this share will be about 12% in 2025.

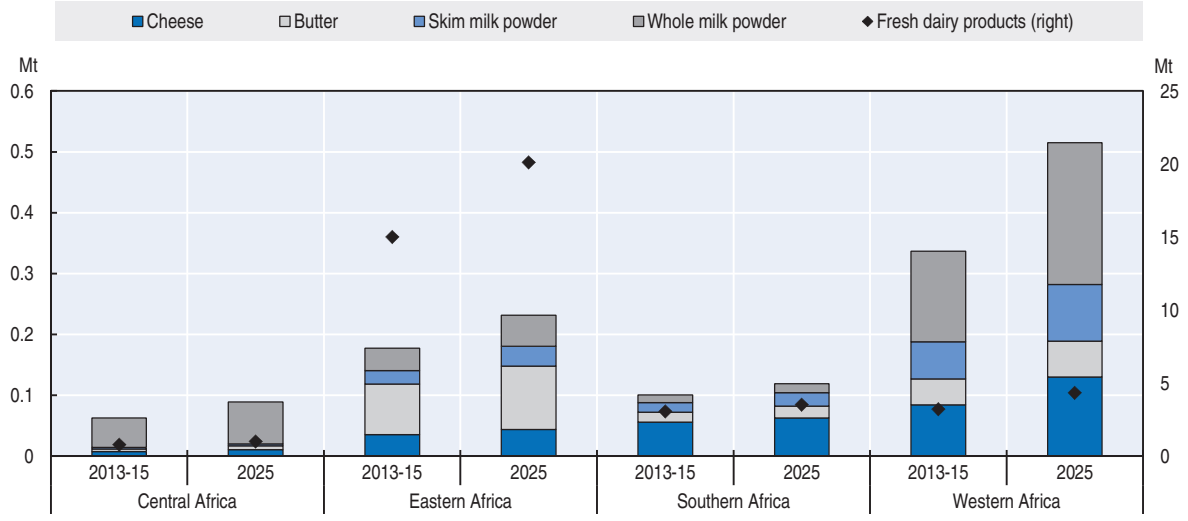
Dairy

Milk production's enormous potential in economic development and food security in rural areas makes dairy an important subsector in SSA. Particularly in Southern and Eastern Africa, commercialisation of the sector has illustrated dairy's potential to provide a regular income source that reduces poverty and improves living standards. Eastern Africa currently constitutes more than half of total milk production in SSA and a vibrant

smallholder farming sector made a considerable contribution to milk production growth of 37% over the past decade. Sustained production growth is projected for the Outlook, rising by an annual average of 2.7% in Eastern Africa and 2.5% in SSA. Kenya's dairy sector represents a particularly well developed value chain in the region, with a range of small, medium and large scale producers and accounts for almost 15% of the additional milk production. Support services in the sector are more developed than other parts of SSA and underpin the success of the sector.

Dairy represents a primary protein source to SSA consumers and fresh dairy products account for more than 90% of total dairy consumption. Demand for dairy products expanded by 1.8% p.a. over the past decade and in light of continued income growth and urbanisation; growth is projected to accelerate to 2.6% p.a. over projection period. Consumption in Eastern Africa is significantly higher than the rest of SSA (Figure 2.25), supported by per capita consumption in excess of 100 kg in Somalia, Sudan and Kenya. Such levels are not only significantly higher than the rest of the region, but also well above the global average. Nonetheless, projected growth is strong at 2.6% p.a. over the coming decade, although consumption remains low in several countries.

Figure 2.25. **Dairy product consumption in Sub-Saharan Africa**



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), *http://dx.doi.org/10.1787/agr-data-en.*

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Given the high share of fresh products in consumption, trade accounts for a very small share of the domestic market. However in Western Africa, skim and whole milk powder account for almost 10% of total dairy consumption – the bulk of which is imported. This trend is projected to continue and supported by strong demand. Skim and whole milk powder imports into Western Africa are projected to expand by more than 3% p.a. to exceed 300 kt by 2025. Although not presently included in modelled commodities, fat filled milk powder is another important dairy product that constitutes a significant share of dairy product imports into Central and Western Africa in particular.

Fruit and beverage crops

A number of developing countries in SSA rely heavily on the export of primary commodities, such as tropical beverages crops, fruits, and raw materials for the bulk of

their export revenues. Such exports constitute an important source of revenue for smallholder producers and provide rural households with employment opportunities at the farm level and throughout the value chain. At the macro-economic level, the production and export of tropical beverages crops, fruits, and raw materials support government fiscal resources through tax revenues, and contribute to foreign currency reserves that facilitate imports of food, and other goods and services. Beyond these benefits, consumption has important nutritional benefits that support food security and sales proceeds enable access to essential staples as well as other goods and services.

The commodities responsible for generating export revenues differ across regions, with wine and fruits such as citrus and table grapes providing the bulk of agricultural export revenue in Southern Africa, compared to cocoa beans and bananas in Central and Western Africa. In East Africa, tobacco is important, as well as beverage crops such as coffee and tea.

South Africa is the main fruit exporter in the Southern African region and historically, citrus leads the way. South Africa is the second largest citrus exporter in the world and the largest in the southern hemisphere. Production is projected to expand continuously and given its high share of total citrus production, oranges account for the largest share of additional production. Relative price shifts induce rapid growth in soft citrus, lemon and lime production. Given the predominance of exports, domestic processing is a small share of the market. Thus orange juice production expands by an annual average of only 0.5%, compared to projected growth in orange exports of 3.5% p.a. Domestic demand for fresh oranges in South Africa is projected to increase by just under 2% p.a. to 2025.

Though typically smaller industries, tropical fruits are important crops across most of SSA. In South Africa, more than 50% of domestic avocado production is exported and exports are projected to expand by an annual average of 4% p.a. in the coming decade, accelerating from 3.4% p.a. over the past ten years. Ivory Coast and Cameroon are major banana producers and exporters. Other tropical fruits make a larger contribution to domestic nutrition than exports, but consumption growth is robust across the region. Papaya consumption is projected to expand by more than 3% p.a. in Africa's developing regions, while pineapple and mango consumption expand by 4.5% p.a. and 4.1% p.a. respectively. Nigeria and Sudan in particular consume large quantities of tropical fruit and the bulk of additional demand is met through domestic production.

Beverage crops represent a very important component of agricultural export revenue, particularly in Eastern Africa. Kenya is the largest tea exporter by some distance and production growth of 3.8% p.a. in the coming decade is sufficient to support export growth of 3.2% p.a., despite firm growth in domestic consumption. Robust export growth in excess of 5% p.a. is also projected in Rwanda and Uganda, albeit from a significantly smaller base.

Challenges and uncertainties

The outlook for agriculture in Sub-Saharan Africa provides many reasons for optimism, but there are major challenges and uncertainties. Demand growth is supported by a rapidly expanding population, combined with firm projected income growth. However income levels across large parts of the region remain very low and growth is from a small base. Maintaining and improving the political and economic conditions for agricultural production growth and food security advances will be crucial. For the vast majority of the region, there is only limited fiscal space to counter a slowdown and growth may depend

on the extent to which governments are able to anticipate shocks to the system. Implementation of policies that maintain macro-economic stability is essential for local and foreign direct investments to continue. For resource-rich countries whose growth has been supported largely by the commodity boom, the extent of investment into economic diversification and integration into global value chains will shape future growth trajectories under a cycle of lower oil and other commodity prices.

From a demand perspective, the distribution of income growth in the coming decade may be as important as the rate. Despite impressive economic growth in the past, poverty rates remain stubbornly high and women, who are a crucial resource in agriculture and the rural economy, are disproportionately affected. Not only are they over represented in unpaid, seasonal and part-time work but they face a number of constraints in accessing agricultural inputs, services and markets that inhibit their pathways out of poverty (FAO, 2015). Greater concentration of consumer demand and land ownership may restrict the breadth of economic growth and slow the poverty-reducing benefits of whatever agricultural growth does occur. Most crucially, income growth restricted to a narrow segment of society would diminish the income multiplier effects that otherwise might encourage more rapid and inclusive economic transformation. By contrast, broad based income growth has the potential to meaningfully reduce poverty, resulting in a rising number of middle to higher income consumers. Large numbers of consumers with the financial means for greater dietary diversity will not only increase total demand for food products significantly, but also change the composition of demand, shifting away from traditional starches toward animal products, fresh fruit and vegetables, as well as more convenient, processed foods. Per capita meat consumption in particular remains very low in the region and significant changes to existing dietary preferences could result in a vastly different outlook on the demand side.

From a supply perspective, one of the greatest challenges faced by the region relates to the slow rate of productivity gains. In this regard, an important uncertainty that will have a far ranging impact on production practices and productivity growth is the extent of concentration of agricultural land, which in turn will also be influenced by land tenure policies. Increasing concentration and commercialisation of medium-scale farmers could accelerate the rate of technology adoption, which has been fairly slow to date. Efficiency gains by a growing number of small, medium and large-scale farms linked into vertically integrated value chain with greater opportunity for access to credit, technology, extension services and off-take agreements, could have a meaningful impact on output levels in the coming decade. Commensurate development of upstream and downstream food sectors could increase the opportunities for non-farm income, which may in turn provide relatively productive small-scale producers with the capital to break through the barriers of subsistence agriculture into more commercialised medium-scale stature.

Productivity also remains low in livestock production and intensive production of pork and poultry has only taken off in selected countries. The region remains a net importer of most feed grains and protein meal, resulting in high prices that are not conducive to investment in intensive production systems. Increased productivity that induces surplus feed grain production accompanied by lower prices could however induce such investment, causing significantly higher feed demand.

Considering the severity of the impact of the 2015-16 drought on food security in the region (Box 2.3), the potential impact of climate change cannot be ignored. The frequency

of drought occurrence is already higher in SSA relative to most other regions in the world and agricultural production remains largely rain-fed. While the precise impacts of climate change on African farming systems are likely to vary spatially in ways that are difficult to predict, two general predictions for which there is now some consensus are greater variability in agricultural production and a possible decline in crop productivity (Schlenker and Lobell, 2010). The evolution of both farm structures and farming practices in the region will impact on the resilience to increasing climatic variability in the future. Increasing the rate of technological adoption, facilitating access to irrigation systems and improved farming practices that support such resilience remains one of the greatest challenges facing the region.

Arguably the greatest challenge facing the agricultural sector in SSA is weak infrastructure including transportation networks, access to energy, irrigation systems and stockholding facilities. Poor transportation networks limit access to markets, often exacerbate high levels of post-harvest losses and also inhibit efficient distribution of inputs such as seed and fertiliser. At the same time, it is an underlying factor in high food prices, as it raises the cost of both inputs and imported food products. Substantial differences in price levels between surplus and deficit regions suggest that investments able to reduce the cost of transportation would hold significant benefits to producers and consumers alike. Not only would it reduce the cost of imported food products to bolster demand, but it would also provide a more lucrative export market for surplus producers.

Conclusions

The significance of the agricultural sector in SSA is reflected in its high share of GDP in most countries, its even greater share of employment and its prioritisation in the development agenda. While the total value of agricultural output has grown markedly over the past decade, SSA remains the most food insecure region in the world, with uneven progress towards eradicating hunger over the past decade. The Malabo Declaration on accelerated agricultural growth strives to eradicate hunger in Africa by 2025. Among other objectives, it targets a doubling of agricultural productivity, a halving of current levels of post-harvest losses and a threefold increase in intra-regional trade levels. Within the context of resilient agricultural systems, it also targets social protection systems and decent employment opportunities for rural populations.

In light of agriculture's clear role in confronting the challenge of eradicating hunger and improving food security, this chapter provides an outlook for agriculture in SSA that considers the complexities associated with the region. The development of the sector in the coming decade will continue to be shaped by policies and megatrends which remain subject to high degrees of uncertainty. These megatrends include factors that will shape food demand such as rapid population growth, income growth (with uncertainties over the rate and distribution), the consequent rise of an African middle class, rapid urbanisation, facilitated access to new information technologies and communication combined with continued expansion of rural population numbers and agriculture's likely role as the single largest source of employment to multitudes of young people entering the labour force.

In light of such factors, the *Outlook* portrays optimistic growth in food demand of more than 3% p.a. towards 2025, yet much of that increase remains driven by population growth and increases in per capita intake remain modest across most of the region. SSA exhibits exceptional diversity in income levels and consumption preferences, hence the product

mix also exhibits regional variation, but robust growth in caloric intake derived from vegetable oil and sugar is evident across most of the SSA region. Increasing diversity in the production mix also provides opportunities to improve dietary diversity and increase potential income generation. The prevalence of undernourishment has been reduced to 5.2% in Southern Africa in 2014-16, yet in Central Africa it remains above 40%. Given rapid population growth, SSA will account for a rising share of the global total of undernourished (Box 1.3). Commensurate with income growth, the greatest increase in per capita caloric and protein intake over the outlook period is projected in East Africa, while the slowest growth rate is attributed to Central Africa, which remains challenged by political instability and civil strife.

SSA exhibits vast agricultural potential, yet production growth in the past has mainly been achieved through continued area expansion. While total agricultural production is projected to rise by 2.6% p.a. to 2025, area expansion slows and an increasing share of production growth is attributed to improved productivity. Multiple factors influence accelerated productivity gains over the outlook, including faster technology adoption associated with the emergence of medium-scale producers and improved integration of smallholder producers into the value chain. Despite improvements, significant yield gaps remain and imports of most primary food products are projected to rise. The extent to which current yield gaps can be closed represents one of the greatest challenges and uncertainties facing the region.

The potential contribution of the agricultural sector to poverty reduction, improved livelihoods of rural households and greater food security in SSA is undisputed and the outlook presented in this chapter remains broadly positive. Yet growth in the sector remains challenged by an uncertain policy environment and poor infrastructural development that limit market access, increase post-harvest losses and raise the cost of trade. Epizootic and climatic events also challenge the medium-term development of the agricultural sector. Thus food prices in the region remain high, which impacts negatively on food security, particularly given that most small scale producers are still net buyers of food products. Significant price differences remain across the region and increased intra-regional trade offers opportunities to improve food security and reduce poverty.

Strategic investment by both public and private sector has the ability to further improve the outlook presented in this chapter. Abundant interest from both foreign and domestic investors has at times been hampered by inconsistent policy application. Thus while public investments into infrastructure, research and extension is critical, the institution of an enabling environment that promotes private investment and job creation in both farming and non-farm sectors will have high pay-offs that are able to smooth continued economic transformation in a region with undoubted potential. Effective implementation of investment strategies at national and continental level will aid in achieving hunger eradication targets, and in transforming food systems in Africa for inclusive growth and shared prosperity.

Notes

1. The Sub-Saharan African region is defined by the United Nations Statistical Division and is used to indicate all of Africa, except Northern Africa, with Sudan included in Sub-Saharan Africa. Regional aggregations are available at *http://unstats.un.org/unsd/methods/m49/m49regin.htm* and detailed in the glossary.
2. A megatrend is a social, economic, political, environmental, or technological change that is typically slow to form yet, when in place, exerts major influence on human behaviour (Jayne et al., 2014). Most of the megatrends mentioned here are detailed in Jayne et al., 2014.
3. The *2014 African Economic Outlook* report projects that foreign investment and official remittances to Africa could reach more than USD 80.0 billion and USD 67.1 billion, respectively, in 2014.
4. Fuglie and Rada (2013) report that fallowed land as a proportion of total farmland in SSA has declined from 40% in 1960 to roughly 15% in 2011. Jayne et al. (2014b) report that fallows have largely been eliminated in smallholder farming areas containing more than 250 people per km^2 of arable land.
5. Full details on the Malabo Declaration are available from *http://pages.au.int/sites/default/files/Malabo%20Declaration%202014_11%2026-.pdf*.
6. The countries included in the MAFAP study are: Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Uganda and the United Republic of Tanzania.

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