OXFORD BUSINESS GROUP

Agriculture in Africa 2021

In collaboration with

OCP

Content Guide

Facts and Figures

Agricultural production in sub-Saharan Africa

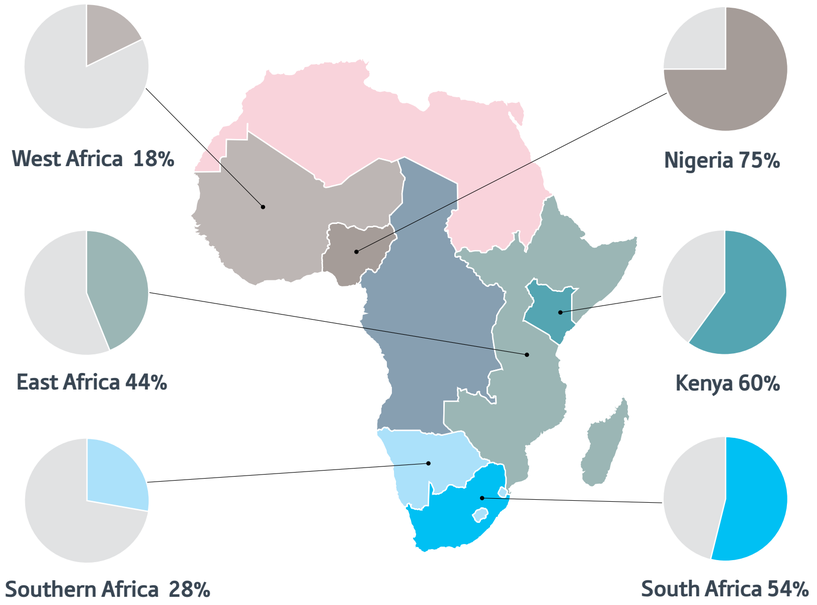
	2007-09 average (000 tonnes)	2017-19 average (000 tonnes; base)	2029 projection (kt)	Growth from base to 2029 (%)	2010-19 average growth (%)	2020-29 proj. average growth (%)
Cereals	109,695	141,025	169,397	20.12	2.42	1.66
Roots & tubers	56,740	86,825	112,016	29.01	3.67	2.28
Pulses	12,350	17,788	19,758	11.08	2.83	0.93
Meat	9080	11,715	14,675	25.27	2.36	2.21
Oilseeds	8044	11,149	13,288	19.18	2.26	1.58
Sugar	6445	7632	10,174	33.31	1.56	2.53
Fish	5626	7695	8291	7.75	2.84	1.07
Vegetable oil	4657	6855	8106	18.24	2.82	1.37

Agricultural trade in sub-Saharan Africa

	2007-09 average ($ bn)	2017-19 average ($ bn; base)	2029 projection ($ bn)	growth from base to 2029 (%)	2010-19 average growth (%)	2020-29 proj. average growth (%)
Exports	7.3	9.7	9.4	-3.1	1.8	-0.6
Imports	19.8	27.5	40.1	45.8	2.6	3.5

Top regions for agriculture-related financing deals in Africa, 2010-Jul 2020 (% of total deals)

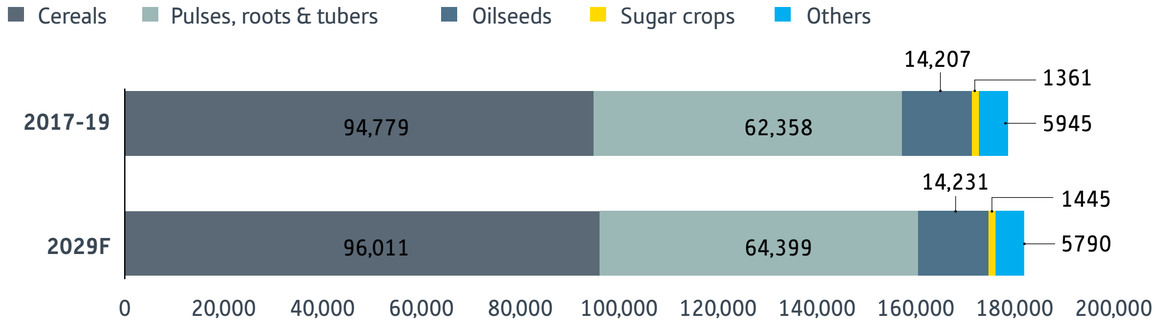
Top markets within these regions (% of regional deals)



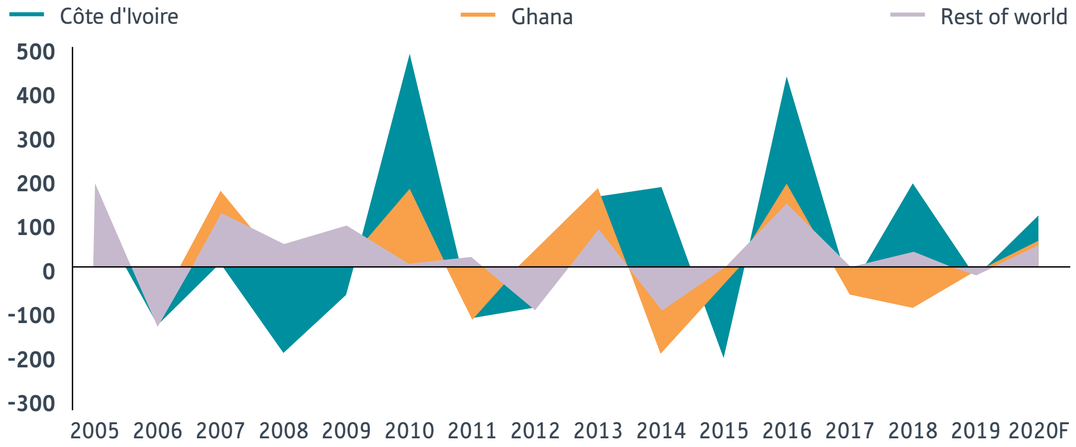
Source: *OECD-FAO Agricultural Outlook 2020-29; Crunchbase*

Facts and Figures

Area harvested by commodity group (m ha)



Evolution of cocoa production, 2005-20F (000 tonnes)



Africa's Top-10 Agricultural Exports by Value, 2016-18

1. Cocoa Beans
2. Cashew Nuts (in shell)
3. Tobacco
4. Coffee
5. Oranges
6. Cotton
7. Sesame Seeds
8. Black Tea
9. Cocoa Paste
10. Fresh Grapes

Source: *OECD-FAO Agricultural Outlook 2020-29; Africa Agriculture Trade Monitor 2020; World Bank*

Recent Performance Indicators

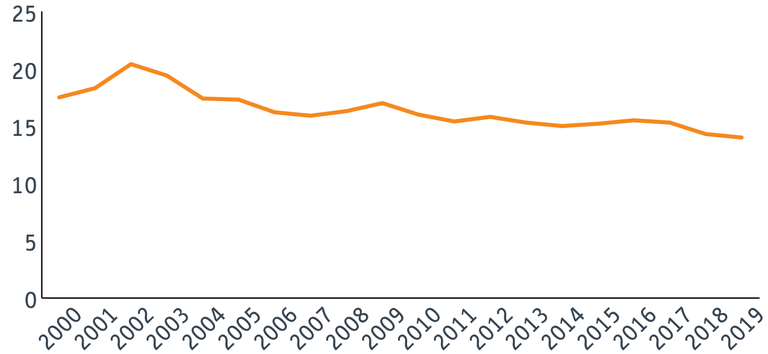
For many countries across Africa, agriculture remains one of the most important sectors of the economy. Agriculture accounts for 14% of total GDP in sub-Saharan Africa, and a majority of the continent's population is employed in the sector. In addition, export crops such as coffee, tobacco, oranges, fruit and cotton are important sources of foreign exchange for every country on the continent.

There are significant regional variations in the relative size of the agriculture sector, as well as its employed population, value added and productivity. In lower-income, landlocked countries such as Chad, the relative size of the sector (over 50% of GDP) and the share of the population employed as subsistence farmers (over 75%) can far exceed the region's average, while agricultural productivity and export earnings lag behind the continental mean.

In North and Southern Africa, improved irrigation and a high degree of mechanisation have ensured greater productivity in certain segments – far exceeding the regional average and on a par with South-east Asia and Latin America. The relative importance of agriculture in wealthier places such as South Africa is lower, at 3% of GDP, according to the UN Food and Agriculture Organisation (FAO).

Overall, the relative size of the sector compared to the total economy has been gradually but steadily declining over the past decades. In 1990 agriculture accounted for one-fifth of the total GDP of sub-Saharan Africa, declining to 18% by 2000 and 15% in 2015. According to projections by the FAO, this figure will fall to 13% by 2029, even as agricultural trade and production are expected to increase over the same period. The percentage of the population employed in agriculture has undergone a similar development, with the World Bank estimating a drop from 62% in 1995 to 52% in 2020.

Agriculture, forestry & fishing's value added in sub-Saharan Africa, 2000-19 (% of GDP)



Nonetheless, Africa's overall agricultural production and export figures have seen major improvements over the course of recent years. According to the "Africa Agriculture Status Report 2020" published by the Alliance for a Green Revolution in Africa (AGRA), cropland expansion and improved access to inputs such as fertiliser and higher-yielding seeds helped gross production value increase by 11% between 2010 and 2016. Looking further ahead, the FAO and the OECD anticipate a further increase of 21% in agricultural and fish production between 2020 and 2029 in sub-Saharan Africa.

Graph source: *World Bank*

Geography and Land Use

The continent is agro-ecologically and climatically diverse, with agro-environmental zones ranging from the tropical rainforests in West and Central Africa, to the dry and arid zones of the Sahel. This diversity offers both opportunities and challenges: while a wide variety of crops and commodities can be produced across Africa, a range of different solutions are required in order to overcome the varying bottlenecks that continue to limit the agricultural potential of the different countries and regions on the continent.

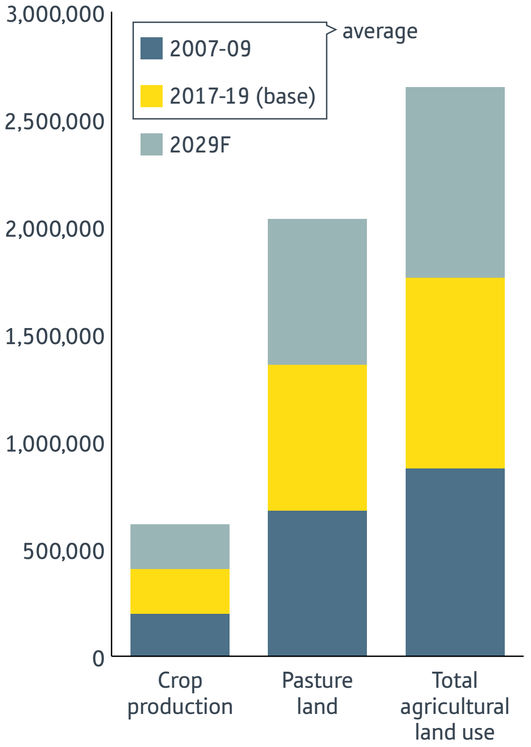
Africa also has an abundance of arable land, much of which is uncultivated. The OECD and the FAO estimate that it accounts for 21% of pastoral land and 14% of cropland. While the latest figures from the World Bank show that as of 2016, 9% of all sub-Saharan African land was arable – an increase on the 5.7% recorded in 1980 – the FAO estimates that Africa holds 60% of the world's uncultivated arable land.

One of the key factors perpetuating the relatively low levels of cultivated land is the challenge of obtaining access to land in the first place. Much of the arable and cultivated land remains unregistered, with the African Centre for Economic Transformation (ACET) estimating that just 10% of arable land on the continent is officially registered; this stands in stark contrast to 95% in Western Europe. In sub-Saharan Africa 90-95% of land falls under a customary tenure system, with largely communal and unregistered ownership. In North Africa, by contrast, a majority (50-75%) of land is individually owned and registered under a modern tenure system.

As a consequence, disputes are common and expensive, with much of the judicial caseload in countries with predominantly customary systems stemming from conflicts over land ownership. The ACET estimates that in Ethiopia 33-50% of all legal cases are land dispute cases; in Ghana such conflicts accounts for half of all new civil cases; and in Uganda land disputes represent about half of the total caseload, leading to an estimated 5-11% loss in agricultural production in the country.

Transactions involving registered land also remain costly in many markets across Africa. The World Bank's "Doing Business 2016" report showed that the monetary cost and administrative burden of land transfer for registered land were significantly higher in sub-Saharan African nations than similar transfers conducted in OECD countries, taking an average of 58 days and costing 8% of the property value in sub-Saharan Africa – compared to an average of 22 days and 4% of property value in OECD countries. According to the most recent data available, sub-Saharan Africa has seen some improvement in property registration procedures, with transactions taking an average of 51.6 days as of May 2019, compared to 23.6 days in OECD economies.

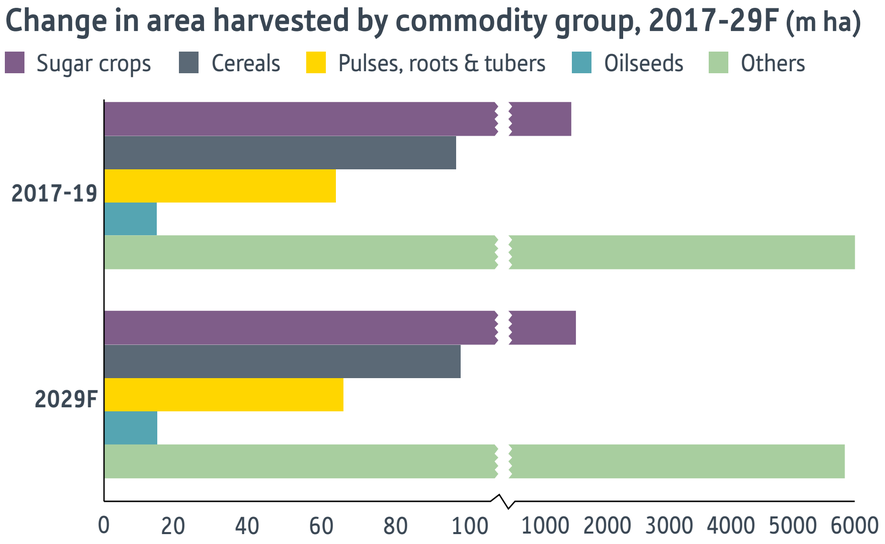
Land use in sub-Saharan Africa, 2007-29F (000 ha)



Graph source: *OECD-FAO Agricultural Outlook 2020-29*

Crops

While crop production is estimated to account for more than 75% of total agricultural production on the continent, there is a large degree of variation within Africa in terms of the regional, national and local production and consumption of crops. Wheat is the main staple in North Africa; Central and West Africa consume higher amounts of roots, tubers and plantains; and maize is central to the diet of those living in Southern Africa.



As a general trend, the quantity of agricultural crops produced, the share of land used for crop production and the total harvest value have seen large improvements over the course of the past decade. The FAO registered 2.86% annual growth in the net value of crop production during the 2010-19 period.

The production of roots and tubers increased the most among all categories of crops, with annual growth of 3.67% between 2010 and 2019, resulting in an average annual yield of 86.8m tonnes in 2017-19, up from 56.7m tonnes per year in 2007-09. The FAO projects that root and tuber production will grow by an annual growth rate of 2.28% between 2020 and 2029, which would see yearly production rise to 112m tonnes by the end of the period. At that rate, the sub-Saharan African region alone would account for an estimated 41% of worldwide root and tuber production.

Cereals, the most widely grown crop on the continent, also saw significant growth in annual production over the period, rising from an average of 109.7m tonnes in 2007-09 to 141m tonnes in 2017-19. With projected 1.66% annual growth between 2020-29, the expected cereal yield in 2029 is 169.4m tonnes.

While land use for crop production has grown slightly over the past decade, from 196.2m ha in 2007-09 to 210.1m ha in 2017-19, the FAO estimates that the next decade will see an annual reduction of 0.13%. The anticipated yield growth is instead expected to develop as a result of improved access to higher-yielding seeds and other important inputs such as fertiliser, along with optimised management practices and infrastructure development, including irrigation schemes.

Despite these improvements, however, crop yields and productivity in Africa remain low compared to the global average. For instance, average yields for maize are about 2.5 times higher in Asia and South America, and six times higher in North America. Meanwhile, African rice yields are roughly half the levels seen in Asia, and North American rice yields are close to four times higher. According to data from AGRA, growth in average African yields for these two staple crops remained relatively stagnant between 2010 and 2020, with the exception of the continent's wheat yield, which rose to global levels in 2011 before moderating below the world average in the years that followed.

Graph source: *OECD-FAO Agricultural Outlook 2020-29*

Livestock and Poultry

Africa produced an annual average of 129.7m tonnes of meat in 2017-19 – an increase on 107.8m tonnes in 2007-09 – to represent average annual growth of 1.1% between 2010 and 2019. Beef production rose at more than twice the rate of general meat production during this period, with 6.7m tonnes produced in 2018 for an annual average growth rate of 2.5% since 2009, when 5.4m tonnes were produced. However, the FAO notes that beef yields declined by 0.5% over the same period due to insufficient infrastructure, low-quality feed and inadequate storage capacity.

FAO projections for 2029 indicate that a 17% increase in cattle and 5% growth in productivity will yield an additional 1.1m tonnes of bovine meat in the region over the next decade. If those figures are achieved, sub-Saharan Africa would contain 18% of the global bovine herd by 2029. The growth in ovine meat will be significantly higher during the same period, with projections indicating that Africa could increase its share of global sheep and goat production from roughly 1% of the global total at present to as much as 14% within 10 years.

Poultry production has also seen significant growth in recent years. The FAO reports that total poultry production for the continent stood at 5.7m tonnes in 2018, up from 4.2m tonnes in 2009. The three largest poultry-producing countries on the continent – South Africa (1.8m tonnes), Egypt (1.1m tonnes) and Morocco (720,000 tonnes) – together account for 62% of Africa's total output.

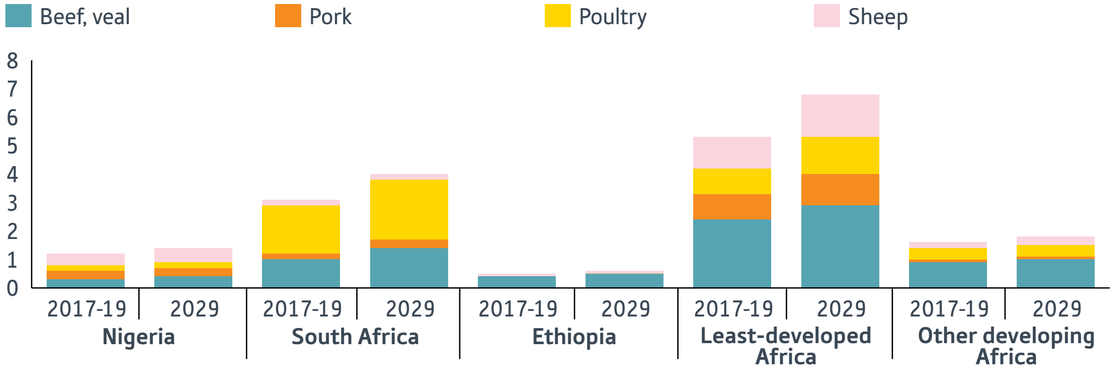
The FAO outlook for 2029 projects a 25% increase of total livestock production in the next decade, primarily driven by poultry and milk production.

As a consequence of rapid and sustained urbanisation and the continued growth of the African middle class, changing consumption patterns are expected to boost demand for all types of meat. The Bill and Melinda Gates Foundation projects that demand for livestock will trigger greater increases in consumption in Africa than in any other region in the world, with demand for meat estimated to rise by 2.8% annually between 2007 and 2030.

Despite the growth in domestically produced meat products, the continent still imports $4.6bn worth of meat and edible offal every year. Local producers continue to struggle to compete with international exporters due to high transport and administrative costs.

According to the Institut du Sahel, livestock produced in Burkina Faso for export to Accra transits through as many as 50 different checkpoints during the 1000-km journey to the end market. Similar obstacles are noted in the International Food Policy Research Institute's "Africa Agriculture Trade Monitor 2020", which estimates that livestock traders pass through five checkpoints for every 100 km of travel in Côte d'Ivoire. Between Mauritania and Senegal, meanwhile, livestock traders paid $24 in bribes per 100 km.

Livestock production in sub-Saharan Africa, 2017-29F (m tonnes)



Graph source: *OECD-FAO Agricultural Outlook 2020-29*

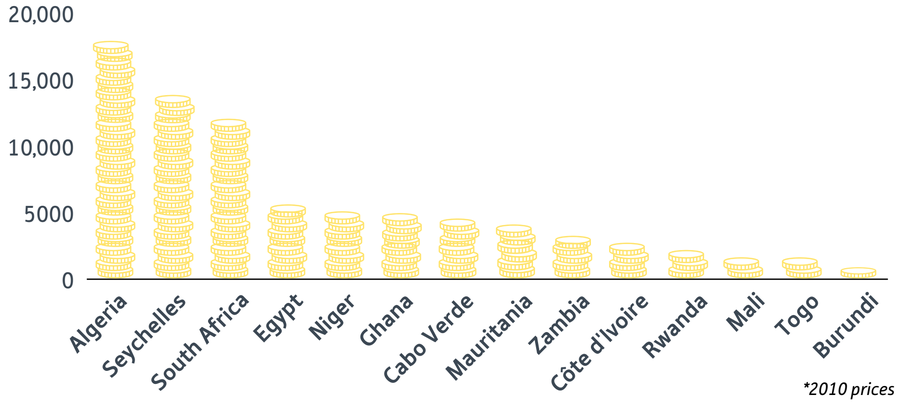
Agro-industry

Agro-industrial development has been limited in most countries in Africa, with the bulk of agricultural exports made up of raw products and the continent importing large amounts of higher-value finished agricultural goods.

An analysis by the ACET shows that the vast majority (75%) of sub-Saharan agro-processing enterprises operate on an artisanal and semi-artisanal scale. At that end of the spectrum, characterised by low productivity and limited market access, such businesses struggle to compete with larger industrial and semi-industrial international producers. In addition, many face a scarcity of high-quality affordable inputs, resulting in an inability to produce at capacity.

As a result, the ratio of agro-processing manufacturing value added to agricultural value added in Africa is below 50%, with the exception of Mauritius and South Africa. However, commercialisation of the agriculture sector, combined with greater linkages between farms and other sectors, could help to facilitate the growth of export-oriented agro-processing. Indeed, there are numerous opportunities for value addition within the sector, including for crops with growing international demand. AGRA notes that Africa has captured some of the processing value for grapes (where the value of processed to unprocessed products stands at 71%), sugar (15%) and tomatoes (11%). Most other agricultural products remain underprocessed.

Agriculture value added* per worker in selected African countries, 2017 ($)



*2010 prices

The International Trade Centre, which tracks both the value of trade and the potential for further trade in processed and unprocessed goods, reports that less than 2% of tea, sesame seeds and cashew nuts were exported as processed goods in 2019. Its export potential database highlights processed cocoa products, shea nuts, cashew nuts, fertilisers and fruit products as having some of the highest untapped export potential in Africa. An ACET report on agricultural transformation lists the same products as very-high-value, underexploited crops and products, along with flowers, meats, yam, sorghum, oil palm and cassava.

Cognisant of opportunities in the sector, African governments and international organisations have collaborated to achieve greater agricultural industrialisation. A key initiative that seeks to link agriculture and industry and promote value chain and market systems development is the Agri-business and Agro-Industry Development Initiative (3ADI+), supported by the FAO, the International Fund for Agricultural Development, the UN Industrial Development Organisation, the African Development Bank (AfDB) and the UN Economic Commission for Africa (UNECA).

At the national level, many countries are promoting special economic zones (SEZs), and offering incentives to agro-processing businesses in the form of tax and Customs benefits, and access to infrastructure, power and trading platforms. Among them is the SKBo Triangle SEZ in West Africa, launched in 2018 as the region's first cross-border SEZ. Jointly operated by Mali, Burkina Faso and Côte d'Ivoire, the zone aims to attract private investment in agri-business and agro-industry.

Graph source: *FAO*

Agriculture Financing

As global food demands continue to rise, with the World Bank forecasting a 70% increase by 2050, the agriculture sector will require $80bn in global investments every year. African food demands are projected to grow more rapidly; the World Bank has estimated that the total size of the market will approach $1trn by 2030.

Difficulty accessing capital is one of the major challenges faced by agri-businesses across Africa. Commercial loans are expensive, and most businesses operating in the sector are small and medium-sized enterprises (SMEs) with little collateral. Commercial bank loans to the sector also fall short; as of 2018 the proportion of loans going to the agriculture sector was equivalent to 3% of total loan disbursements in Sierra Leone; 4% in Ghana, Kenya and Nigeria; 6% in Uganda; 8% in Mozambique; and 12% in Tanzania. Moreover, estimates show that about 10% of African households in rural areas are connected to formal financial institutions. Innovations such as microfinance and mobile banking provide opportunities to boost African farmers' access to loans. As mobile penetration has increased in recent years, reaching 44% in 2017 in Africa, local entrepreneurs and international institutions have developed digital financial solutions aimed at supporting farmers.

Alternative forms of financing, including private equity (PE), have become a small but growing source of funding for agri-businesses. Between 2010 and July 2020 business information platform Crunchbase reported 242 agriculture-related deals in Africa, raising $616m from entities such as NGOs, foundations, banks, angel investor networks and private investment funds. PE funded 19.4% of the total.

There are a number of private investment entities focused on agriculture in Africa, with varying deal sizes. In addition, large African PE firms have raised generalist funds, including some focused on agriculture.

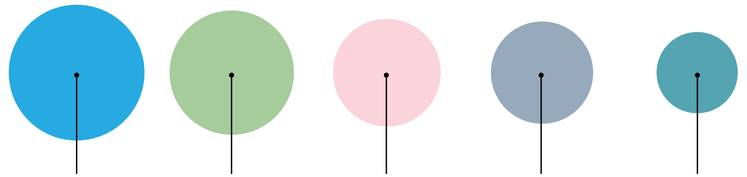
The approximately two dozen funds involved in smaller deals with ticket sizes under $10m are often specialised and provide capital to SMEs. They also facilitate impact investment and investment in frontier markets, with capital coming predominantly from development finance institutions.

Venture capital is also becoming an increasingly important – albeit still relatively minor – part of the funding ecosystem, as angel investors move to fund agricultural start-ups across the continent.

As of 2018 there were 82 African agri-tech start-ups, around half of which were launched between 2016 and 2018. In 2017 agriculture ventures raised $59m in capital. Agri-tech start-ups comprised $13.2m of the total, according to data from Crunchbase – an increase of 203% from 2016.

Regional patterns in food & agriculture FDI in Africa, 2003-17 ($ bn)

Aggregate FDI per region

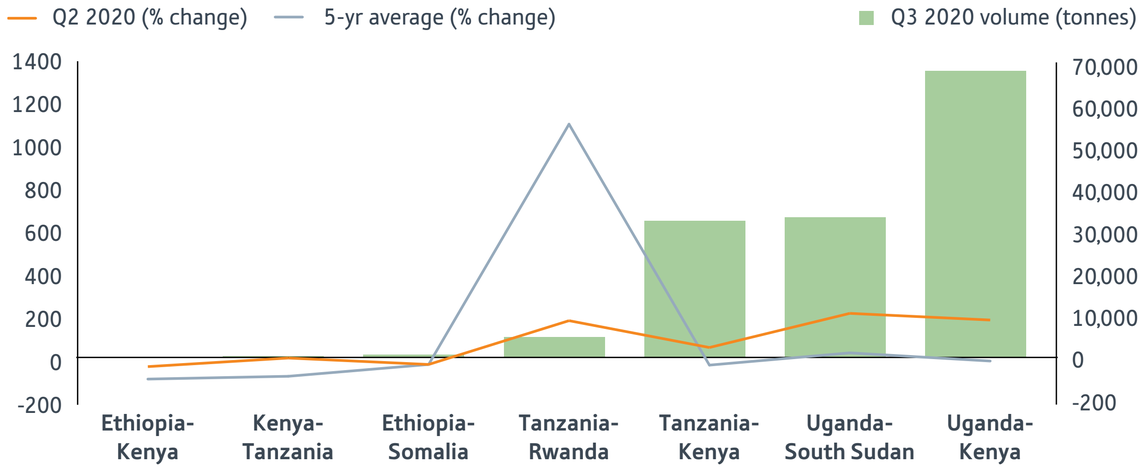


Top FDI destination countries	
Nigeria	4.0
Egypt	2.9
Cameroon	2.5
South Africa	2.5
Ghana	1.9
Angola	1.5
Ethiopia	1.5

Graph source: *AgEcon*

Covid-19

Cross-border maize trade



While Covid-19 negatively impacted the performance of the agriculture sector in the initial months of the pandemic, particularly during lockdowns, the fallout has been comparatively contained. The top immediate concerns of agri-businesses across the continent included constrained cash flow and reduced revenue, especially for export commodities like cocoa, coffee and horticulture products, and for agri-businesses with strong ties to the hospitality industry.

Although it is too early to assess the full extent of the pandemic's damage, the available data indicates that the impact on cross-border trade has also been relatively contained. According to the "East Africa Cross-Border Trader Bulletin" published by the Market Analysis Subgroup of the Food Security and Nutrition Working Group in the third quarter of 2020, Covid-19 measures implemented in the first quarter of that year delayed trucking and increased transportation costs and border screening measures. However, while the 140,000 tonnes of maize grain traded in the third quarter was 29% lower than the five-year average, it was 130% higher than in the previous quarter.

Results from the African Fertiliser and Agri-business Partnership's "Covid-19 Impact Assessment on the Agri-SMEs and Smallholder Farmers" concluded that the supply of extension, mechanisation and farm equipment and implement was more sensitive to Covid-19-related shocks than core agro-dealer services. The crisis also had a significant negative impact on sales and the broader customer base, particularly in July and August 2020.

AGRA anticipates that the pandemic will have major lasting impacts on the sector. On the positive side, however, it expects consolidation in the mid- and downstream, alongside the shift to online trading platforms, to accelerate. However, reduced income growth in the near term will likely slow down any major economic transformation in the sector.

The UN World Food Programme (UNWFP), for its part, estimates that 265m people could face food insecurity, up from 135m in pre-pandemic forecasts.

Nevertheless, the long-term effects of Covid-19 on the sector could prove to be more positive. The significant oil price decline has shifted attention back to agriculture in oil-dependent countries like Nigeria, where agricultural products are seen as a source of diversification and foreign currency. International organisations have also responded rapidly to the needs of the sector. The AfDB's $10bn Covid-19 Response Facility, for example, included the delivery of climate-smart agricultural interventions to avert hunger. Furthermore, the AfDB's Feed Africa Response to Covid-19 looks to the post-pandemic period by aiming for regional self-sufficiency in African food systems.

Graph source: *ICPAC*

AfCFTA and Trade

Africa was a net exporter of food products up until the 1980s. High economic growth from the early 2000s and rapid population increases drove up domestic demand for food, while falling raw commodity prices along with weak infrastructure and low levels of investment in agricultural development contributed to reduced agricultural exports. As of 2019 the continent's agricultural trade balance was -$18.4bn, with an annual food import bill of roughly $68.5bn between 2014 and 2019.

Across the different regions, North Africa imports the largest amount of food, accounting for 31% of all food imports in Africa. Top imports include cereals (31% of all food items imported by Africa), vegetable oils (12%), sugar (9%), dairy (6.8%) and meat (6.2%). Broken down further into subcategories, wheat represents 50% of all imported cereals, rice 27% and maize 20%. In terms of exports, Southern and West Africa are the largest food-exporting regions, with Central Africa exporting the least.

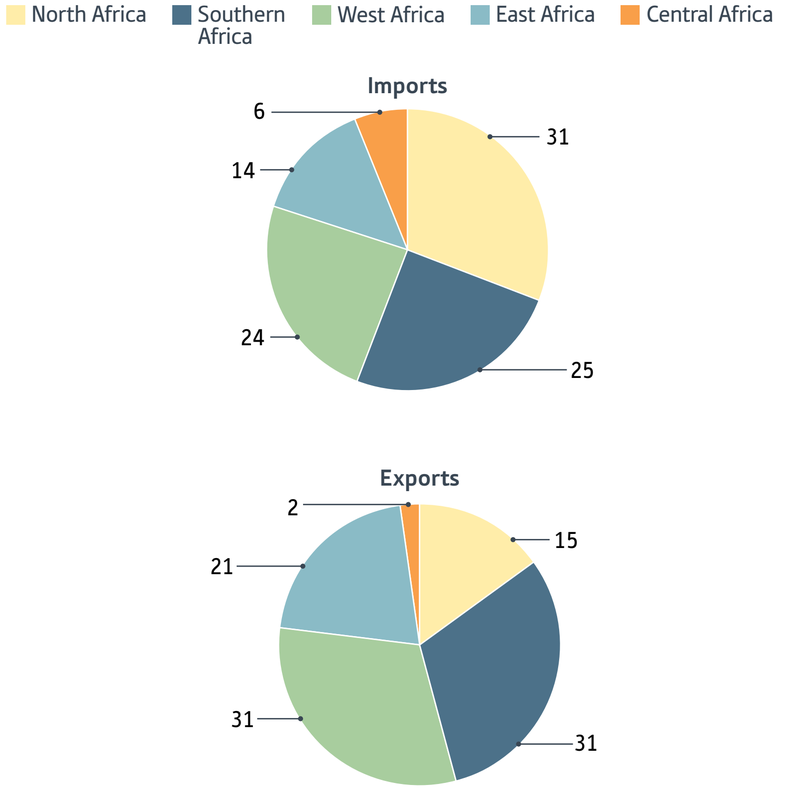
The level of intra-regional trade in agricultural products is lower in Africa than in other regions of the world. African countries imported just 15% of all food from other countries on the continent. With the operational phase of the African Continental Free Trade Area (AfCFTA) agreement entering into force on January 1, 2021, it is expected that the share of intra-continental trade for all products will rise significantly.

Benefits for agricultural trade are projected to be among the most significant. A 2020 analysis by the IMF indicated that agriculture would amount to 16% of the welfare changes anticipated to arise from the agreement, with smaller countries in particular to see a large positive impact.

The AfCFTA will result in the elimination of tariffs for 90% of products originating from signature countries by 2021, and will increase further to 97% by 2030. UNECA estimates that this will lead to $10bn-17bn worth of additional intra-African trade in agricultural products – an increase of some 20-35% compared to current levels of trade across the continent. According to the FAO, products that are forecast to see particularly significant rises in continental trading include meat, milk and dairy products; sugar, beverages and tobacco products; vegetables, fruits and nuts; and paddy and processed rice.

While the tariff reductions are likely to have a positive impact on agricultural trade, non-tariff measures – in addition to relatively high administrative and logistical costs – continue to pose serious obstacles to trade on the continent, especially between different economic regions.

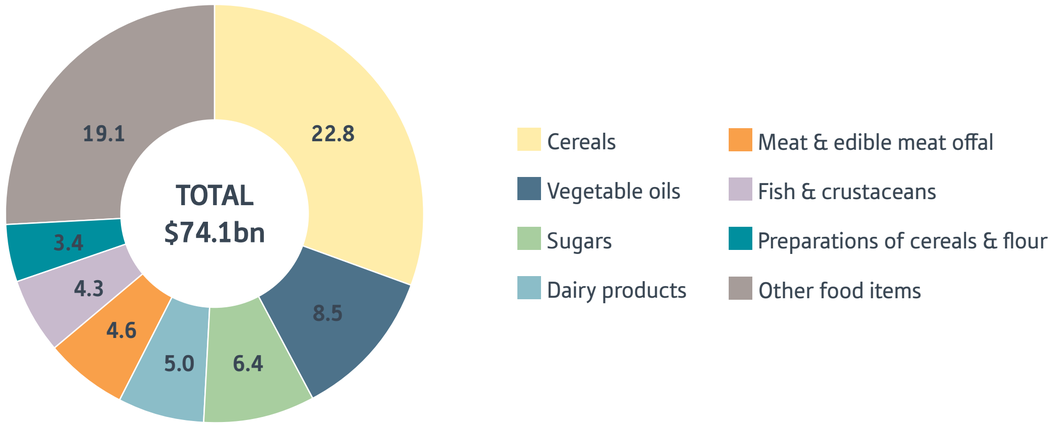
Share of average annual food trade by region, 2010-19 (%)



Graph source: *AGRA*

Food Security

Annual average major food imports to Africa, 2010-19 ($ bn)



Covid-19 has weakened food security in Africa through reductions in income and supply chain disruptions, combined with food price inflation as a result of lower availability of agricultural labour and diminished liquidity for traders. In November 2020 the UNWFP estimated that 137m more people – equivalent to an increase of 82% – could face acute food insecurity in 2020, bringing the total to approximately 270m.

Food security was already a major concern in Africa prior to the pandemic, with the continent importing $35bn in food annually, according to the AfDB. The most acute causes of food insecurity are in fragile and conflict-affected states, particularly those affected by extreme weather events. In particular, climate change is poised to further exacerbate this insecurity.

The International Development Association reports that the frequency of climate shocks – extreme weather events causing food production declines of 2.5% or more – increased from once every 12.5 years between 1982 and 2006 to once every 2.5 years between 2007 and 2016. One of the worst locust outbreaks in decades compounded the situation in East Africa in 2020, with Ethiopia, Kenya, Somalia and Uganda all hit by swarms, which damaged early harvests and caused $8.5bn in crop and livestock losses.

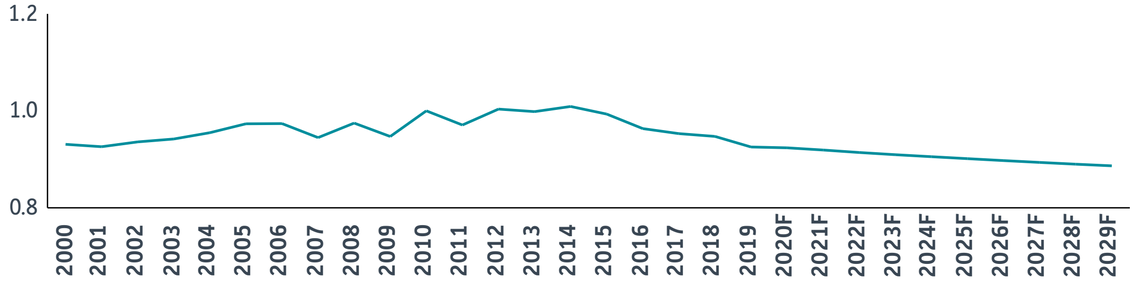
In direct response to these challenges, government involvement increased in many countries in 2020. For example, the Nigerian government reduced fertiliser prices, increased intervention funding for the sector, and lowered interest rates on existing intervention funding from 9% to 5%. Meanwhile, as part of the Covid-19 economic recovery plan, the government of Ghana executed an expansion of its food security programmes such as Planting for Food and Jobs, including a number of initiatives which are designed to provide better access to important agricultural inputs such as seeds, fertilisers and machinery.

International organisations like the World Bank have also pledged their support, offering $5.3bn in commitments for short-term relief and investment to address the driving causes of food insecurity on the continent. Among the longer-term projects planned are numerous partnerships with local governments and the private sector, including agri-tech start-ups. Digital technology could play an important role in strengthening local service delivery and the value chain. Other key agricultural interventions that could result in more robust food production in Africa include more climate change-resistant seeds and better irrigation technology.

Graph source: *AGRA*

Outlook

Per capita value of net agriculture & fish production in sub-Saharan Africa, 2000-29F



The pandemic has seriously complicated the short- and long-term outlook for Africa's agriculture sector. Employment, trade and productivity have recovered in some regions and subsectors, and government and international support programmes have done much to provide relief for the most severely affected segments. While exporters of commodities such as cocoa, flowers and coffee faced declining demand, some of the more severe projections about agri-business disruption failed to materialise.

Credit ratings agency Fitch Solutions noted a return to pre-Covid-19 levels for certain commodity prices and trade volumes by the third quarter of 2020, and forecast a recovery in agricultural product consumption for 2021. Similarly, global consultancy McKinsey concluded that Africa's strong late-2019 harvests helped minimise the impact of Covid-19-related disruptions on the continent's agriculture and food systems.

Nonetheless, the ongoing fallout from the global economic downturn will likely make for a challenging environment for farmers and agri-businesses alike, compounded in some cases by issues like locusts, conflict and extreme weather.

For those active in the sector in countries that have put food security high on their development agenda or are looking for agricultural development as a strategy to ensure greater diversification, however, the crisis could provide additional opportunities. Accelerated adoption of digital technologies and supply chain improvements are also likely to lead to greater increases in productivity.

The implementation of the AfCFTA agreement, while delayed due to the disruptions caused by the Covid-19 pandemic, has also become an important focal point for many governments at a time when trade flows are regionalising. The countries on the continent that take advantage of the opportunities for increased intra-continental trade and develop stronger agro-processing industries are likely to reap the most benefits.

Value addition and commercialisation in agriculture are instrumental to driving economic transformation and boosting employment levels once structural challenges – in particular, infrastructure deficits, skills gaps, financing shortages, lack of access to key inputs and land disputes, as well as underdeveloped linkages to other sectors – are addressed. Key to unlocking the opportunities provided by the continent's young, growing and increasingly urbanised labour force, developing middle class and abundance of arable land are technological leapfrogging, well-timed and stategic investments, and targeted incentives.

Graph source: *OECD-FAO Agricultural Outlook 2020-29*

Mohamed Anouar Jamali

CEO, OCP Africa

To what extent has the Covid-19 pandemic impacted agriculture across Africa?

The pandemic has had a significant impact on almost all business sectors and companies around the world, yet agriculture has shown resilience as evidenced by increased yields thanks to government support. The agriculture sector accounts for around 15% of the continent's GDP and employs six out of 10 people. The heightened risk of food insecurity due to the pandemic has led governments and businesses to boost efforts to keep agricultural operations running smoothly and safely. According to the World Bank, the global market for agricultural products proved more resilient than overall trade, thanks to national and local government support to address the risks related to food insecurity. Although the sector had a relatively strong year in 2020, social-distancing measures made it difficult for farmers to connect with customers directly; finding seasonal workers became more difficult; and cooperatives struggled to secure enough buyers, given that large customers such as hotels and restaurants were unable to operate as usual.

What measures has OCP Africa taken in response to pandemic pressures on farmers?

We took several steps to help mitigate major impacts in order to keep the African agriculture sector running during the pandemic and meet food consumption needs on the continent. Building on our experience in farmer-centric activities, and with continued effort to assist local governments and public institutions, we scaled up our flagship Agribooster programme that offers a holistic approach centred around smallholder farmers. It helps them to raise their income through a sustainable increase in yield via capacity-building programmes, agronomic training, high-quality input packages, supply and financing mechanisms, and market linkages that teach farmers about market demand in terms of quality and price. Based on the Agribooster model, our Covid-19 initiatives have reached more than 350,000 smallholder farmers in four countries. In Côte d'Ivoire, for example, OCP Africa supported the national Plan d'urgence Riz through a comprehensive approach that includes supplying adapted inputs to rice farmers.

How has the pandemic prompted governments to improve agricultural supply chains?

The pandemic has forced governments in Africa and many international organisations to rethink how food supply chains function to ensure food can still reach consumers. Over 60% of Africa's population live in rural areas and are dependent on smallholder or family farming. Therefore, movement restrictions, disruptions to food supply and limited market access can have devastating effects, such as heightened food insecurity. We believe that investment in technology and training can lead to improvements in supply chains across Africa. Digitalisation will help smallholder farmers protect their operations against other future crises. Sensors, drones and satellite imagery could assist with farming or delivery, ensuring that food systems continue to operate despite major disruptions. During the Covid-19 pandemic, an increased number of farmers used their phones to contact input suppliers, receive advice and learn new skills, proving that digital technologies and smartphones are changing the agriculture industry for the better.

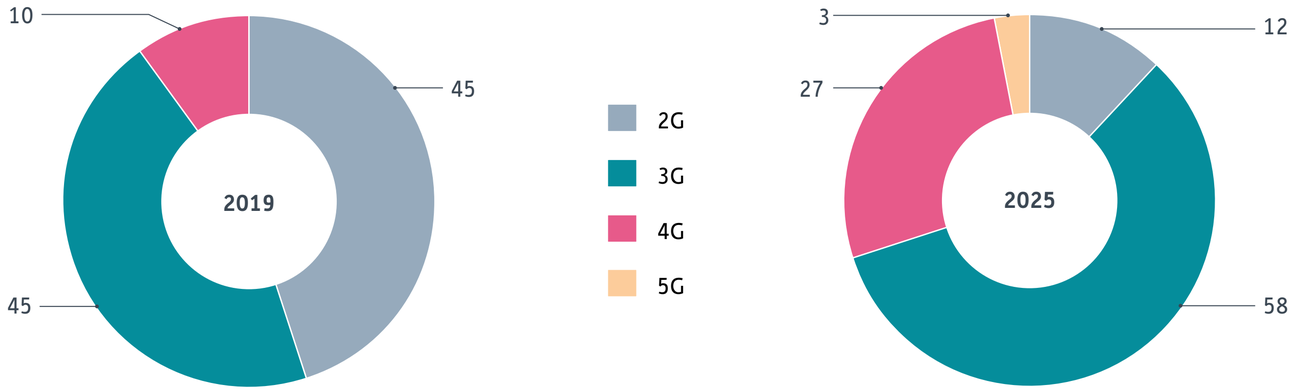
Fostering an Agri-tech Ecosystem

Accelerated Use

The disruptive and transformative potential of agricultural technologies (agri-tech) has become increasingly apparent in recent years, and Covid-19 has further accelerated the trend towards greater use of ICT in Africa's agriculture sector. During the pandemic, digital solutions that enable a continuation of business while allowing customers and employees to adhere to social-distancing measures have boosted the adoption of technology across many sectors, including agriculture.

A 2020 report on success stories from smallholder farmers and small agricultural enterprises published by the African Fertiliser and Agri-business Partnership highlights some of the immediate applications of digital service delivery during the pandemic. USSD codes, WhatsApp group messages and other mobile phone-enabled communication methods were used by small and medium-sized agricultural operations to provide basic digital extension service delivery, while e-payments allowed merchants to conduct cashless transactions. In a similar vein, Ghana-based agri-advisory service Farmerline – which, prior to the pandemic focused on providing training and information to farmers, in addition to enabling access to credit – provided Covid-19 updates to its network through a series of voice messages.

Mobile connections in low- and middle-income countries of sub-Saharan Africa, 2019 vs 2025F (%)



Although these relatively basic forms of technology were already available to many smallholder farmers prior to 2020, the pandemic seems to have accelerated their adoption in rural areas and boosted the availability of innovative digital services. In the "Digital Agriculture Maps 2020" report on the state of the sector in low- and middle-income countries, mobile operator association GSMA notes that Covid-19 resulted in a dramatic spike in mobile money usage in a number of countries. For example, in Rwanda – where the government encouraged the use of mobile money for cashless transactions – network operators recorded a five-fold increase in transactions during the lockdown and record numbers of new subscribers on mobile money platforms.

Widespread use of mobile money has enabled the provision of many other digital services to farmers and agri-businesses in Africa. The number of agriculture-focused digital financial services across the continent has increased rapidly: from 52 in 2015 to 150 as of 2019. The majority of these services in sub-Saharan Africa are based in the east, where mobile money has achieved the greatest degree of penetration to date. According to the Technical Centre for Agricultural and Rural Cooperation's 2018-19 "Digitalisation of African Agriculture" report, nearly half of sub-Saharan Africa's solutions for the digitalisation for agriculture were headquartered in East Africa, with almost two-thirds of farmers in the region using such services.

Graph source: *GSMA*

Fostering an Agri-tech Ecosystem

Diversified Services

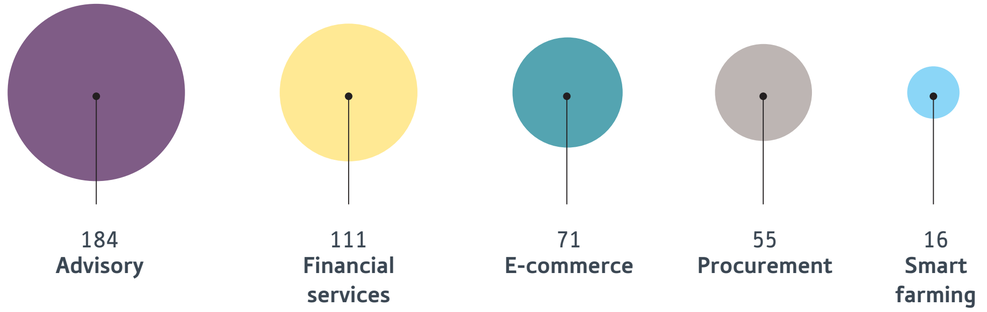
Broader financial inclusion also allows for greater adoption of e-commerce, with agri-tech company Twiga Foods proving one clear example as a service that allows smallholder farmers to sell directly to customers. During the pandemic the company teamed up with the pan-African e-commerce platform Jumia, considerably expanding the reach of its customer base in Kenya. The total number of agricultural e-commerce services in sub-Saharan Africa has grown exponentially, from three in 2009 to more than 70 as of 2019.

Insurance is another service that is becoming increasingly available to smallholder farmers as a result of digitalisation. Almost all (97%) of sub-Saharan African smallholders were uninsured in 2018, according to GSMA. This compared to Asia, where 78% had no insurance, and Latin America, where 67% were uninsured. High costs on the side of the provider and low trust and awareness of smallholders have ensured the persistence of this large gap, but index-based mobile micro-insurance is opening doors. Companies such as Agriculture and Climate Risk Enterprise Africa – which has insured over 1m farmers in Kenya, Tanzania and Rwanda – are seeing opportunities for expansion across the continent. With Covid-19 demonstrating the vulnerability of the agriculture sector to local, regional and global disruptions, along with climate change-induced weather risks that are expected to become more common in the coming decades, the demand for insurance is likely to grow.

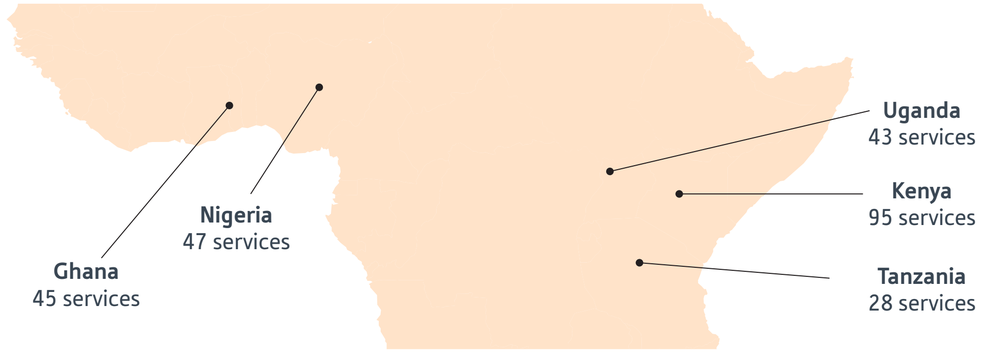
As the traditional finance sector is meeting less than 3% of the global needs for smallholder financing, crowdfunding is becoming an important digital solution to the lack of investment in African agriculture. Nigerian start-up Farmcrowdy, founded in 2016, offers double-digit returns on investments directly allocated to individual farms. Through this model, the company has raised more than $15m for 25,000 farmers since its creation. Tapping into its network of farmers and investors, the firm has expanded its services to provide insurance and information products to farmers, while also venturing into logistics activities.

Other crowdfunding platforms have sprung up in recent years, with particular success in Nigeria, where companies such as Thrive Agric, Payfarmer, Porkvest, FarmFunds Africa and PorkMoney compete for investors.

Active digital agriculture services in sub-Saharan Africa by type, January 2020



Top-five countries by number of digital agriculture services, January 2020



Graph source: *GSMA*

Fostering an Agri-tech Ecosystem

Future Transformation

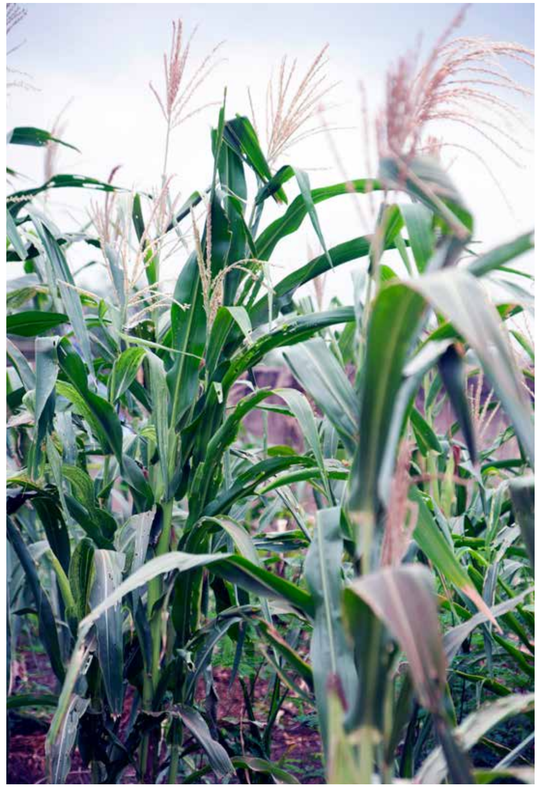
While digital advisory and digitally enabled financial services are the most common types of agri-tech currently deployed on the continent – with the Technical Centre for Agricultural and Rural Cooperation (TCA) stating that advisory services alone make up two-thirds of all registrations – more complex agricultural technologies provide great opportunities for long-term transformation of the sector. Smart and precision farming using the internet of things (IoT) leverage drones and sensors to monitor and improve the productivity of crops, livestock and aquaculture, which could help close the continent's yield gap. However, as the GSMA points out in its 2020 report, Africa has few scalable IoT networks and many farmers operate on too small a scale to make many of the services commercially viable. In 2019 the African Development Bank noted that the majority (54%) of all digital agriculture solutions were still used by commercial agribusinesses, with many services remaining unaffordable to small-scale farmers.

Nonetheless, the wide range of agri-tech products and services that have seen commercial success is only expanding. According to the TCA, 60% of the 390 active digital agricultural solutions that were available in Africa in 2019 were launched after 2016, and 20% since 2018. More than 33m smallholders have used at least one of these services, and an estimated 70% of service providers generate revenue. The TCA estimates the potential market revenue to be between €2.3bn and €5.3bn, with only €127m currently captured.

Governments have been leveraging digital tools as well: leadership in Mauritius, Uganda and Rwanda are using ICT solutions to update and improve their land information systems. In Rwanda the use of drones and GPS has enabled the government to register approximately 11.3m parcels of individually owned land and 8m title deeds between 2010 and 2014 at an average cost of just $8 per parcel. Widespread adoption of such solutions could formalise much of the agriculture sector, since most African countries currently face challenges in ensuring rapid and accurate land administration. An ill-administered land registration process poses a major obstacle to commercial farming.

Governments will also play an important role in creating an enabling environment for both agri-tech start-ups and established companies. The success of the mobile money incentives introduced by some African governments during the pandemic demonstrates the power of conducive policies. With more investment in digital infrastructure, digital education and the clarification of digital regulations, the current momentum for agri-tech innovation is likely to lead to substantial long-term benefits across the sector.

Costs of Climate Change



With the negative impacts of climate change on African agriculture becoming more apparent, efforts to improve sustainability are increasingly putting climate considerations at the heart of interventions. The main threats to the sector include more and longer droughts, higher frequency of climate-induced disasters and extreme weather events, and accelerated desertification. Much of Africa is vulnerable to droughts due to the predominance of rain-fed agriculture. An estimated 6% of the continent's arable land is irrigated, which means the majority smallholder farms are highly sensitive to more unpredictable seasons, as well as prolonged periods of excessive heat and erratic rainfall. On the University of Notre Dame GAIN Vulnerability Index, which tracks the countries most vulnerable to climate change, eight of the top 10 are located in Africa. The 2016 droughts in Eastern and Southern Africa, for instance, led to significant harvest reductions and greater food insecurity.

Rising temperatures are also contributing to desertification, affecting yields in places such as Senegal, Mali, Burkina Faso and Niger in the Sahel, and in North African countries including Morocco. Africa is already the second-driest continent, according to the UN Food and Agriculture Organisation (FAO), with deserts making up 50% of surface area and 40% of the continent affected by desertification. In 2019 Mozambique, Malawi and parts of Zimbabwe were hit by cyclones Idai and Kenneth, while droughts affected harvests in the Sahel and the Horn of Africa. Storms and floods are also damaging the ecosystems many farmers rely on. "Climate change will have an impact on the availability of water and land, as well as the variability of growing conditions from year to year," Aniss Bourraqadi, head of agronomy at OCP Africa, told OBG. "We have to develop a culture of producing more with less and using innovative approaches, combined with more diversification in terms of cropping systems, to ensure greater resilience in agriculture."

Biodiversity loss – which result from both climate change and deforestation caused by intensive production of crops such as cocoa, rubber and oil palm – is another major concern. The Covid-19 pandemic has created additional urgency to halt this process. Recent studies on pandemic prevention indicate that loss of forest cover can lead to a much greater likelihood of contact between humans, wildlife and livestock, which can result in the spread of zoonotic viruses such as Covid-19 and Ebola. Investment in tropical forest preservation has therefore been increasingly seen as a global priority.

The frequency of climate shocks – extreme weather events causing food production declines of 2.5% or more – increased from **once every 12.5 years** between 1982 and 2006 to **once every 2.5 years** between 2007 and 2016

Infographic source: *International Development Association*

Climate-smart Agriculture Solutions

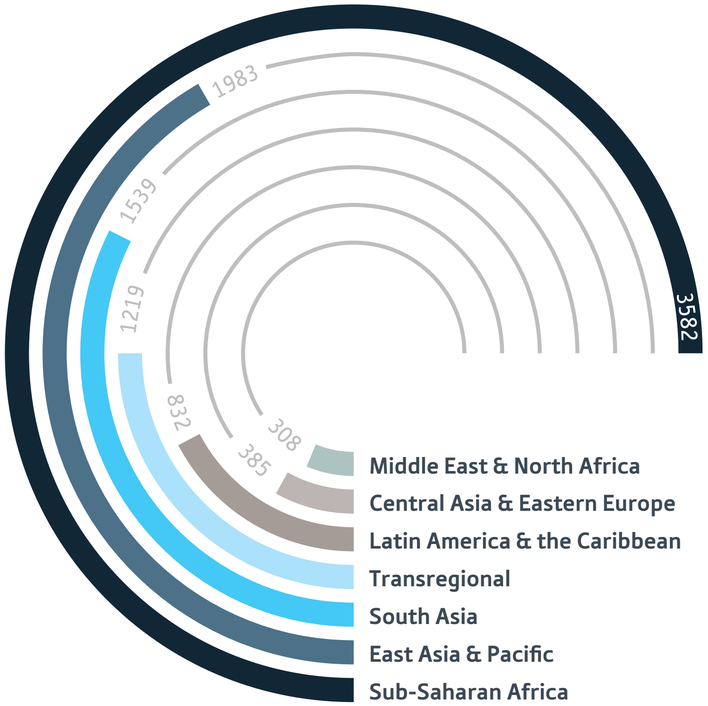
In response to the evolving nature of environmental challenges, stakeholders in Africa and around the world are increasingly deploying climate-smart agriculture (CSA) as both a solution and a model for sustainable agriculture. The FAO defines CSA as "an approach to developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change", which incorporates both adaptation (building resilience in the face of the inevitable consequence of climate change) and mitigation (reducing or removing greenhouse gases released via agricultural production).

Major development institutions such as the African Development Bank (AfDB) have incorporated CSA into their climate change agendas. For example, the AfDB's Second Climate Change Action Plan (2016-20), which guides the bank's climate change and green growth interventions, has the promotion of CSA as the first of its six priorities. The AfDB also provides some of the much-needed climate financing required to maintain sustainable agriculture development on the continent; it pledged to mobilise $25bn in 2020-25, for example, and invested some $3.6bn in 2019, equivalent to 35% of the institution's investments.

Overall, however, the continent struggles to attract sufficient climate finance. This is in part explained by the overarching bias in climate financing towards mitigation strategies, which account for roughly 90% of current financing. Africa faces a disproportionately higher impact of climate change and has relatively low greenhouse gas emissions, requiring proportionally more funding for adaptation. The UN's International Fund for Agricultural Development (IFAD) is another major global development partner focused on mobilising climate and environmental finance for the agriculture sector. Among the agency's agricultural sustainability programmes is the Adaptation for Smallholder Agriculture Programme (ASAP), which directly assists smallholders with irrigation, land use system management, poverty reduction and climate-resilient farming practices. With $300m in donor financing, ASAP has directed funds and support to 8m vulnerable smallholders in 43 countries, primarily in Africa.

Other continent-wide projects, such as the Sustainable Agricultural Mechanisation in Africa framework led by the FAO, provide further support to African farmers in addition to ensuring improved environmental practices and climate resilience.

Distribution of climate finance by region of destination ($ m)

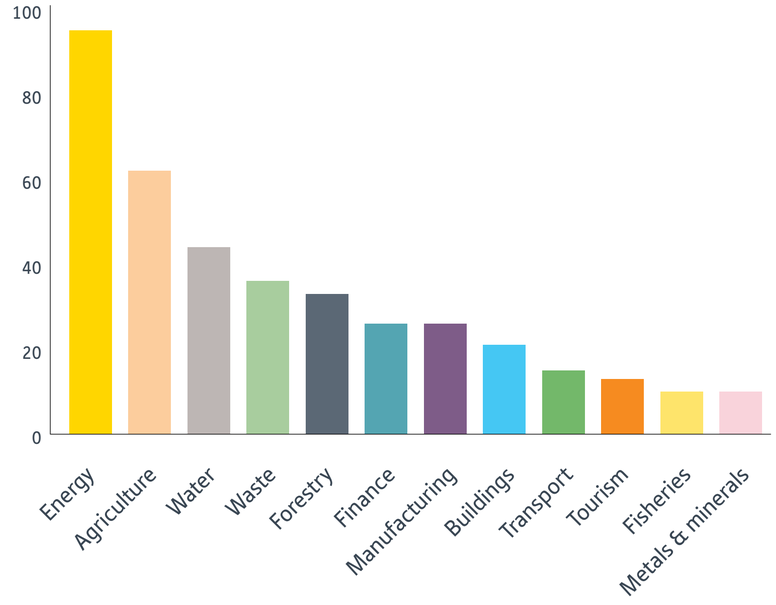


Graph source: *"Examining the Climate Finance Gap for Small-Scale Agriculture", November 2020, IFAD*

Bridging Gaps in Funding

Investors see climate-related opportunities for Africa in energy, agriculture & water

Where do you see the most opportunities for climate investments in Africa? (% of respondents)



Nevertheless, there are funding gaps that remain to be addressed. An analysis of some 4000 agricultural loans worth a combined $2.7bn conducted by the Council on Smallholder Agricultural Finance in 2019 identified several areas where further subsidies would be advantageous. These include smaller loans, loans to African businesses, new borrowers, informal value chains and long-term loans.

Blended finance, a strategy which involves the use of concessionary development-oriented funding to mobilise private capital, is increasingly being used for fundraising in this sphere.

Solar energy is one area of sustainable agricultural development where private and development finance have already forged fruitful collaborations in Africa.

The South African Institute of International Affairs notes in a 2020 policy brief that agriculture accounts for just 2% of all electricity consumption, despite employing roughly half of the continent's workforce.

The growth of renewable energy, particularly in the form of decentralised solar power, could enable greater agricultural productivity in Africa – for instance, by providing electricity to solar water pumps for crop irrigation, or by deploying agro-photovoltaic (PV) projects, whereby crops are sheltered beneath elevated solar PV panels.

A recent example of these potential benefits can be found in the South African maize industry. A partnership between Jaguar New Energies and a Netherlands government fund provided financing for the initial set-up costs of solar power for farmers. The International Food Policy Research Institute estimates that the resultant green energy rollout boosted maize production in the country by as much as 30% in 2020. This demonstrates the potential for declining costs and opportunities for commercialisation at scale to facilitate the rapid adoption of renewable energy in the agriculture sector.

Indeed, the International Renewable Energy Agency has noted significant reductions in the cost of all commercially available renewable power generation technologies over the course of recent years, particularly for solar. Figures from 2018 show a 26% decrease in the cost of concentrated solar power, with solar PV declining by about 13%.

Investors have also taken note. The solar off-grid technology vertical received the second-largest amount of funding among venture capital-funded projects in Africa in 2019, receiving $247m and accounting for 12.2% of all venture capital tech funding on the continent that year, according to investment platform Partech.

Graph source: *Survey of 176 energy professionals conducted by African Business magazine, published August 2020*

Sidiki Cissé

Director-General, National Agency for Rural Development of Côte d'Ivoire

To what extent has assistance been provided to farmers in Côte d'Ivoire during the pandemic?

The government of Côte d'Ivoire took a number of measures to support agricultural production and avoid a drastic decline after the outbreak of the Covid-19 pandemic. For example, it launched the Agricultural Emergency Programme, which supported more than 100,000 farmers across the country. Farmers were provided agricultural inputs and materials free of charge, and received support for the commercialisation of their products.

Meanwhile, revisions were made to existing programmes to ensure that they adhere to sanitary measures and social-distancing rules. While remote work was adopted, communication continued via telephone calls and text messages due to the fact that not many people in rural areas have internet access. More broadly, we built on the knowledge gained from our previous experiences with outbreaks such as Ebola and malaria to raise awareness and inform our partners of the measures they need to take to reduce the pandemic's impact on agricultural activity.

What steps should be taken to ensure that the continent is well positioned to meet the challenges of food security?

Africa will double its population in 30 years, and food security measures must be implemented at the continental level. Emphasis should be placed on post-harvest activities because there are a lot of issues related to the processing and preservation of certain products that have not yet been resolved. Particularly, we need to have a closer look at the redistribution of produce. To this end, research is now focused on the quality and productivity potential of certain crops. This is a path that needs to be explored further in order to improve agricultural practices and harvests in Africa. Other aspects that must be discussed include the reduction of transport costs and the commercialisation of products.

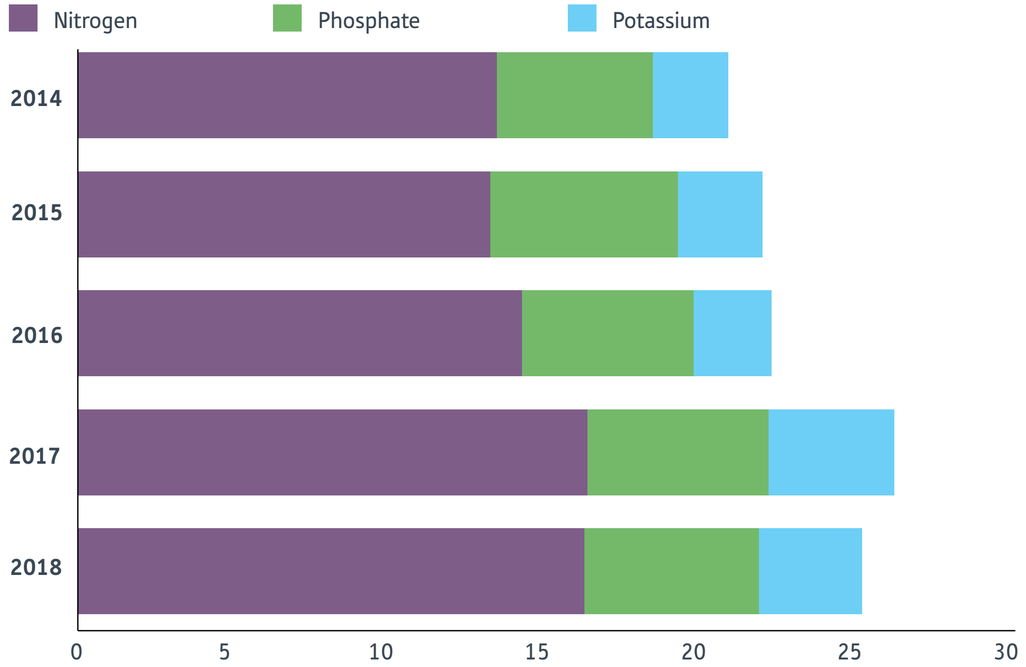
Food security will be an increasingly challenging issue in the years to come, which is likely to see people seek job opportunities in agriculture. Therefore, we need to incentivise the younger generation to participate in the sector by making agro-industry more attractive. We must also take into account the need to modernise agricultural practices, and this will require adhering to new standards for the production, preservation, pricing and distribution of crops at both a regional and continental level.

In what ways can new technologies help modernise and improve the agriculture sector across different stages of the value chain?

New technologies have become an essential and efficient tool in the agricultural production chain for various steps such as processing and commercialising products, as well as providing advice to farmers, which can now all be done online. ICT tools, such as drones, can improve productivity, for example. ICT could also modernise farmers' financing methods and enable payments via e-banking platforms. We need to promote this kind of practice in Côte d'Ivoire, particularly because it can help reduce the risk of theft. Furthermore, the use of ICT is important for traceability at the production level, from the geo-referencing of production plots to the final product that will be or has already been processed.

Adoption Boost

Fertiliser use by area on cropland in Africa, 2014-18 (kg per ha)



The widespread adoption of fertilisers is key to improving agricultural productivity in Africa. However, usage remains well below the global average and significantly beneath the targets set by regional governments and intergovernmental organisations, despite recent growth in both sales and production.

At the Africa Fertiliser Summit held in June 2006, ministers of agriculture from African Union member nations committed to a number of measures with the aim of improving the adoption rate of fertiliser for farmers on the continent. Recognising the importance of fertiliser access in order to achieve Millennium Development Goals such as food security and poverty reduction, the ministers agreed to declare fertiliser a strategic commodity without borders.

The summit led to the Abuja Declaration on Fertiliser for the African Green Revolution, which included the resolution that countries should increase the level of fertiliser usage in sub-Saharan Africa from an average of 8 kg per ha in 2006 to at least 50 kg per ha by 2015.

By comparison, average fertiliser consumption worldwide stood at 135 kg per ha in 2006, highlighting the need for more extensive adoption.

While the long-term trend has been towards increased use by area on cropland, the most recent figures from the UN Food and Agriculture Organisation (FAO) indicate that African countries missed the Abuja target in 2015 and have yet to reach it in subsequent years.

For the region as a whole, combined use of potassium, nitrogen and phosphorus averaged 25.1 kg per ha in 2018 – an increase on the total of 17.8 kg per ha recorded a decade prior and roughly equal to the 25.4 kg per ha recorded in 2017. While use of fertilisers on the continent has remained below the global average, the FAO reported in 2020 that Africa's global share has increased. Its share of the world's total consumption exceeded 3.5% for nitrogen and phosphorus, and 2% for potassium in the years from 2015 to 2018, up from a 3% share of nitrogen, 2.5% for phosphorus and 1% for potassium between 1961 and 1964.

Graph source: *FAO*

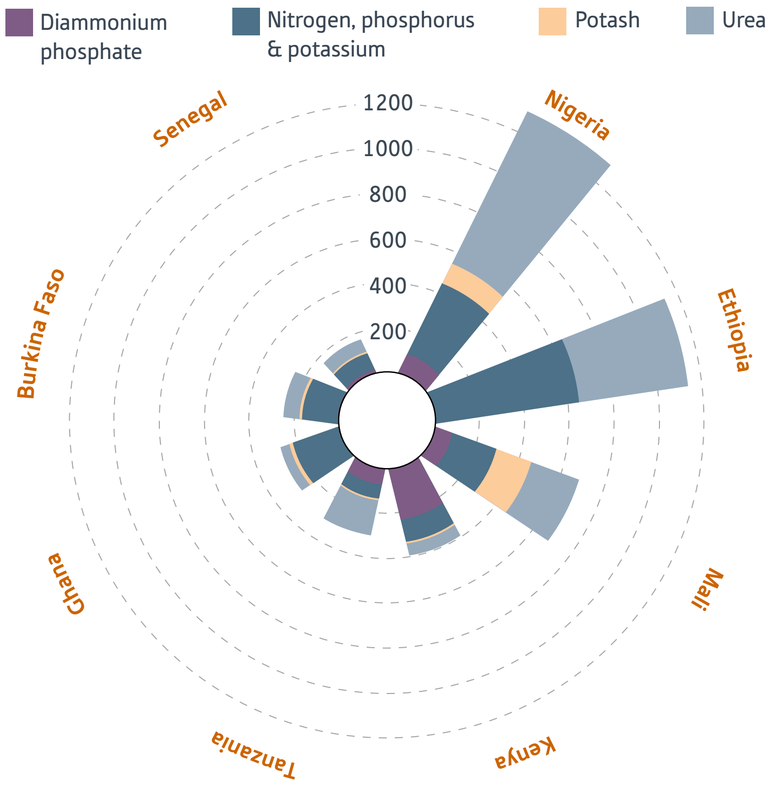
Consumption Drivers

There are notable gradations of nutrient use within Africa, with the most recent FAO figures showing that nutrient use was highest in Southern Africa, at 68.2 kg per ha in 2018, followed by Northern Africa, with an average of 55.2 kg per ha; Eastern Africa with 20.7 kg per ha; and Western Africa with 13.9 kg per ha. Central Africa had the lowest consumption, at 5.2 kg per ha. The FAO data showed West Africa with the greatest increase in average nutrient use in the decade leading to 2018, particularly for nitrogen, which nearly tripled from 2.7 kg per ha in 2008 to 8 kg per ha in 2018; and phosphate, which rose from 0.9 kg per ha to 2.9 kg per ha over the same period. Moreover, there is significant variability in nutrient use within countries. For example, a 2017 piece by Sheahan and Barrett published in peer-reviewed journal *Food Policy* found that five regions in Ethiopia had a use rate below 10 kg per ha, while three others surpassed the national average of 45 kg per ha.

The low rate of nutrient consumption in Central Africa can be partially attributed to the input's relative higher cost, in large part due to transport expenses for landlocked countries such as Burundi, Rwanda, Uganda, the Central African Republic and Burkina Faso. This correlation was supported by an article published by the African Development Bank (AfDB) in July 2020 that states such costs comprised between 30% and 60% of the farm gate price of fertiliser. However, the implementation of the African Continental Free Trade Area is expected to boost investment in intra-regional infrastructure and harmonise trade regulations and standards. This will, in turn, help bring down transport-related expenses.

The trend of increasing urbanisation and densification of rural areas is also expected to reduce the costs of fertilisers and other inputs as the distance between farmers and commercial centres shrinks. Indeed, proximity to urban areas was identified as an important driver of the greater use of modern inputs, according to the "Africa Agriculture Status Report 2020", published by the Alliance for Green Revolution in Africa.

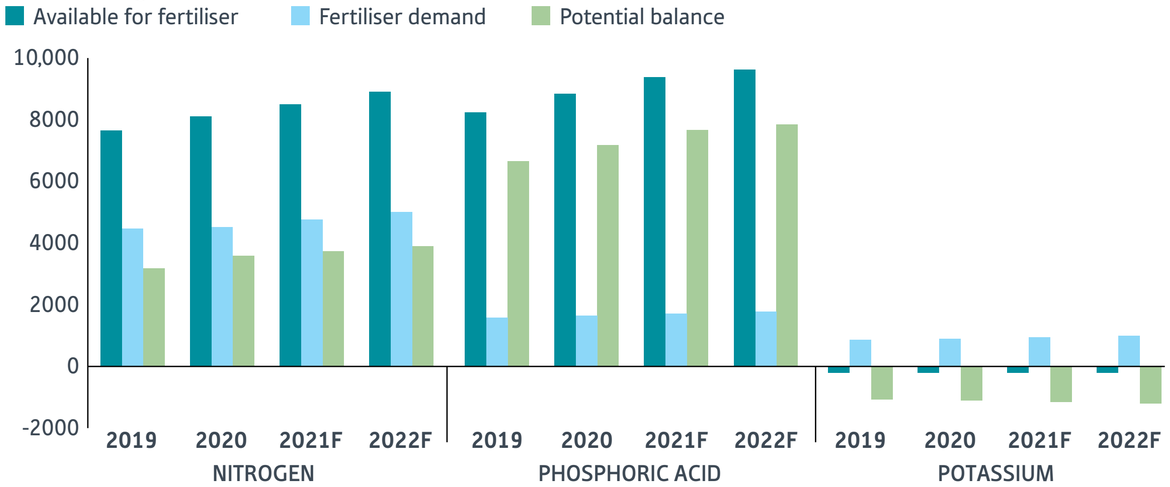
Fertiliser use by country, 2018 (000 tonnes)



Graph source: *African Fertiliser and Agribusiness Partnership*

Investing in Value Chains

Fertiliser growth in Africa, 2019-22F (000 tonnes)



Investment in domestic fertiliser value chains will further encourage fertiliser adoption. According to a 2019 analysis by the Bonn Centre for Development Research, nearly half of the $48.7bn in foreign direct investment in the continent's agriculture sector in 2003-17 was directed to the pesticides, fertilisers and agro-chemicals segment. Moreover, the bulk of this funding (86%) went to fertiliser projects.

Some of this activity was driven by initiatives such as the AfDB's Africa Fertiliser Financing Mechanism (AFFM), an initiative established in line with the organisation's industrialisation strategy to channel greater funding to the fertiliser segment. In November 2020 the AfDB approved the participation of the AFFM in a $4m partial trade credit guarantee with OCP Africa – a subsidiary of Moroccan phosphate producer OCP Group – to improve the financial inclusion of stakeholders along the value chain. OCP Group, the world's largest phosphate producer, supplied 58% of phosphate-based fertilisers used in Africa in 2019 and has made major investments across the continent. Fertiliser sales by OCP Group to African nations rose nearly nine-fold between 2010 and 2020, from 208,000 tonnes to 2m tonnes.

In response to rising sales and greater demand for specialised products, the company has accelerated investment in local production facilities. "The current trend in fertilisers is to have more customised formulas," Habiba Mouttaki, head of sales and marketing for OCP Africa, told OBG. "Customising fertilisers depending on the needs and characteristics of the soil can have a huge impact on farmers' productivity and revenue."

In mid-2020 OCP Group announced that it is expecting to complete an ammonia plant in Nigeria and a fertiliser plant in Ghana by 2024. The 750,000-tonne-per-year ammonia plant, which is valued at $1.4bn, will provide inputs for the Jorf Lasfar industrial complex in Morocco. Another OCP plant in Ethiopia is set to produce 2.5m tonnes of fertiliser by 2024, while construction on new blending plants was under way in Rwanda and Nigeria as of mid-2020.

Additional works in this area included the AfDB providing a $100m loan to Nigeria's Indorama Eleme Fertilizer & Chemicals in 2018 to establish a plant with the capacity to produce 1.4m tonnes of urea annually. That same year Danish catalysis firm Haldor Topsoe committed to help construct a plant worth $2.5bn near Pointe Noire in the Republic of Congo.

The Covid-19 pandemic has spurred private sector efforts to ease smallholder farmers' access to productive inputs. An initiative spearheaded by OCP Africa in Nigeria involved the sale of fertiliser at subsidised rates to assist affected farmers across 12 states and consequently boost long-term food security. It also offered training, access to markets and tech support to over 50,000 smallholder farmers.

Graph source: *FAO*

Closing the Gender Gap

African farmers face many challenges and constraints, with the lack of finance among the most pervasive obstacles to farmer empowerment. A 2020 report by global management consulting firm Bain & Company on farmer-allied intermediaries in Africa noted that there is an $80bn gap in debt available for agricultural small and medium-sized enterprises earning under $15m a year – a result of low credit availability and high interest rates of 15-30%.

While the lack of finance – in addition to other challenges facing the agriculture sector – affects farmers across all demographics, research shows that women and youth are disproportionately affected.

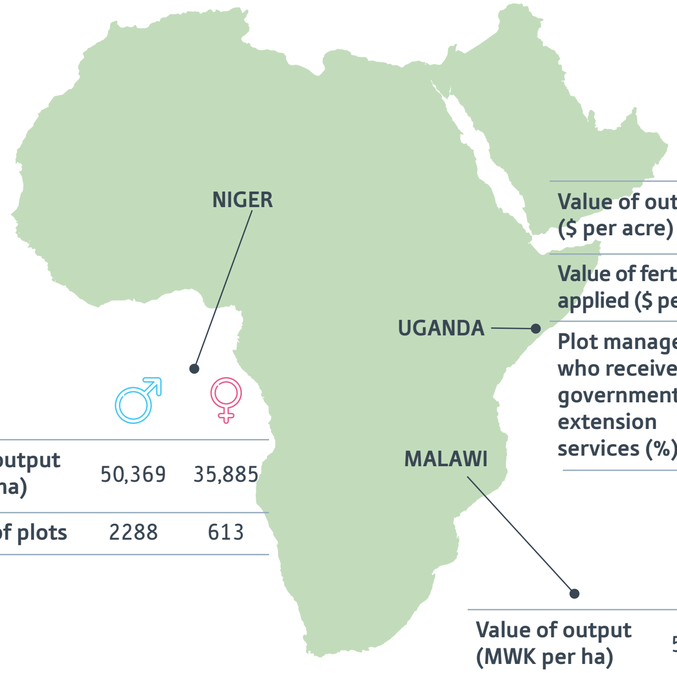
Aware of the benefits of empowering those groups specifically, development organisations and governments are increasingly tailoring their efforts to target those demographics.

According to the UN Food and Agriculture Organisation (FAO), if women – who compose 43% of the agricultural labour force in developing countries – had the same access to finance as men, agricultural output could rise by up to 4% in 34 countries, potentially reducing the number of undernourished people by 12-17%. Currently, in some African rural communities, women are not allowed to have their own bank accounts, negotiate with suppliers or use other financial services. Other gender-based constraints include comparatively diminished access to technology, services, modern inputs and markets. Across Africa, women also tend to have smaller plots, and less control over labour and land.

As a consequence, data from the World Bank's Living Standards Measurement Study show that agricultural production measured as output value, the amount of fertiliser applied, the value of fertiliser applied per acre and purchased seeds applied tend to be significantly lower for plots managed exclusively by men compared to those managed exclusively by women in several surveyed African countries.

In Niger, for instance, output value stood at around CFA50,300 for male-managed plots, while female-managed plots produced roughly CFA35,900. Similarly, in Uganda, there is a gender gap in terms of access to fertiliser, with male-managed plots registering $1.17 worth of applied fertiliser per ha, while the comparable figure for female-managed plots stood at $0.12.

Outputs & inputs on farm plots managed exclusively by men or by women



NIGER	♂	♀
Value of output (CFA per ha)	50,369	35,885
Number of plots	2288	613

UGANDA	♂	♀
Value of output ($ per acre)	158	129
Value of fertiliser applied ($ per acre)	1.17	0.12
Plot managers who received government extension services (%)	22.9	16.9

MALAWI	♂	♀
Value of output (MWK per ha)	56,810	42,477
Number of plots	12,029	4534

Source: *World Bank*

Empowering Farmers

Youth Participation

Youth empowerment is also an emerging priority, as youth labour participation in agriculture is falling despite insufficient employment opportunities for the continent's growing population in other sectors. Data from the Living Standards Measurement Study - Integrated Surveys on Agriculture on a number of African countries, namely Ethiopia, Malawi, Niger, Nigeria, Tanzania and Uganda, show that the proportion of those aged 16-25 working in the sector is lower than their share of the overall population in all surveyed countries except Niger. While the median age in Africa is 19.7, the average farmer in Africa is estimated to be around 60 years of age.

In recent years some African governments and international organisations have started to target greater youth involvement directly through agricultural initiatives. The African Union declared the 2009-18 period the Decade on Youth Development in Africa, encouraging member states to support job creation for their younger cohorts. In a similar vein, the FAO recognised agriculture and agriculture-related activities as "the most immediate means of generating income for large numbers of young people in Africa".

An example of a multilateral programme was the 2014-19 Expanding Youth Employment Opportunities Along Aquaculture and Cassava Value Chains project. With FAO support, a number of West African countries, including Burkina Faso, Côte d'Ivoire, Ghana, Guinea Bissau, Nigeria and Senegal, provided training and support for jobseekers aged 18-35.

Off-farm employment along the agricultural value chain could provide opportunities to empower youth in agriculture. A number of policies could be employed to make the sector more attractive to youth and to create more value for farmers in general, including farmer education; infrastructure improvements; mechanisation programmes; improved warehousing; financing and input subsidisation; and export promotion programmes, which help farmers achieve certification and quality control.

Digital technology is another important empowerment tool that could enable greater participation and improve economic security for both women and youth. While digital innovation in agriculture is likely to provide opportunities for young skilled people, technologies such as mobile money, which are expanding financial service delivery, are helping close the gender gap in access to financing.

In recent years Moroccan phosphate producer OCP Group initiated a number of programmes in collaboration with government ministries, research institutes and other private sector players to provide a suite of tools to farmers in several African countries. In 2019 OCP launched two initiatives, Farmer House and AgriPromoter in Nigeria, which aim to provide improved inputs to farmers in remote areas.

"Previously, many farmers who lacked access to basic agricultural inputs such as fertiliser and improved seeds had to travel for hours to urban centres," Mohamed Hettiti, managing director of OCP in Nigeria, told OBG. "Farmer House can reach as many as 500,000 farmers in rural communities and provide not just inputs, but also access to training, mechanisation, markets, digital tools and financial resources."

Joseph Boahen Aidoo

CEO, Ghana Cocoa Board

What measures can be taken to increase cocoa processing capacity in Ghana?

There is already a government policy in place that requires at least 50% of cocoa production to be processed in-country. However, processing in Ghana to date has largely been related to primary refinement – a basic level of processing – and typically does not include either secondary cocoa processing or tertiary cocoa processing.

The regulators have shown their commitment to increase cocoa processing at all levels of the value chain. In tandem with this, another government policy aims to double domestic consumption of locally produced cocoa over the next few years. Once consumption rises, there will be more scope for businesses to locally process the crop.

The private sector is called upon to take advantage of this opportunity, and help stimulate consumption and build a large market base not only in major cocoa-producing countries like Ghana and Côte d'Ivoire, but in larger markets such as Nigeria.

How can the cocoa farming industry be made more sustainable in terms of both environmental and social considerations?

We believe that sustainability is a collective responsibility for the industry. As members of the government, we must work to ensure that farmers are producing cocoa sustainably, especially by avoiding practices that lead to deforestation. In addition, regulators can promote sustainable cocoa farming to the younger generation and help farmers secure a higher income that will keep them engaged in cocoa production.

To this last point, while the natural environment ought to be protected, we also need to think about the social and economic aspects of farming when trying to craft a more sustainable cocoa industry. Indeed, we cannot talk about sustainability if farmers are not making decent incomes. When the income of a farmer improves, they will be in a better position to take care of their farms without involving their children, and will not expand their planting into protected forest areas.

In which ways can technology help to further develop the cocoa industry?

Technology is critical to the further development of the cocoa industry in Ghana. For example, we have now introduced slushes – which farmers use in weeding their farms – that have motorised pruners. Before, cocoa farmers had to use machetes to do these activities, which was seen as a disincentive for people to take up cocoa farming.

Another major concern of recent years relates to how payments are made. Paying cocoa farmers by cash is very insecure, so we are now putting a system in place to pay farmers electronically.

We also have plans to use GPS to keep track of where each cocoa farm is located and where farmers are operating in order to avoid the expansion of cocoa farming into forests. Technology is moving the industry to the next level, and it is our expectation that with the continuous adoption of technology, younger generations of Ghanaians will be attracted to cocoa farming.

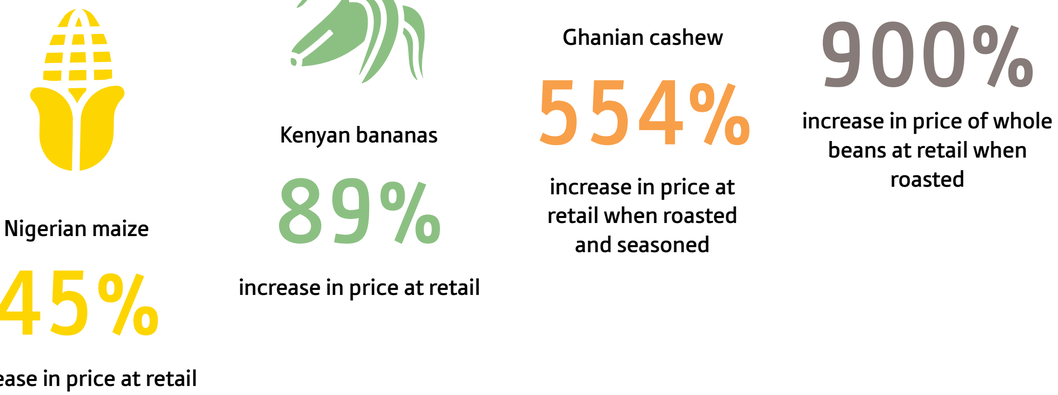
Promoting Agricultural Entrepreneurship

Agri-food System Transformation

Most agricultural workers are either subsistence farmers or very small operators unable to develop the scale necessary to emerge as viable agri-businesses. The Alliance for a Green Revolution in Africa (AGRA) estimates that 85% of the region's agricultural output is produced by small-scale commercial farmers, while subsistence farmers and large-scale agriculturalists make up the remaining 15%. According to a study by McKinsey, there are fewer than 100 farmers cultivating more than 50 ha of land in all of Nigeria.

The factors that have held back the growth of African agricultural enterprises are similar to those that have constrained agricultural productivity and outputs in general: underdeveloped physical infrastructure, insecure land rights, a lack of access to inputs and machinery, a lack of technical training and insufficient financial resources. In addition, the agricultural sector has failed to capitalise on the continent's youthful population. While 60% of the African population is under the age of 25, the average age of a smallholder farmer is around 50.

The rising value of processed agricultural goods could attract more young people to work in farming



Despite these challenges there are some positive signs of current and future growth in the number and scope of agricultural entrepreneurs. AGRA notes that the rise of supermarkets in Africa has led to an increase in the number of medium-scale, entrepreneurial farmers. Local smallholder farmers who are able to meet the high supermarket quality and volume standards earn greater profits, which they can then reinvest while scaling up their businesses.

This process, described by AGRA as "agri-food system transformation", is particularly prevalent in land-abundant countries; medium-scale farmers (those cultivating between 5 ha and 100 ha) in Ghana, Malawi, Rwanda, Nigeria, Senegal, Tanzania and Zambia have driven most of the increase in agricultural output witnessed in the last decade.

Other factors that are contributing to a rise in agricultural entrepreneurship include a growing demand for prepared foods, restaurants using local ingredients as a consequence of rapid urbanisation and the rise of disruptive agri-tech.

Infographic source: *Bain & Company*

Improving Trade and Policy

While cross-border agricultural trade has not provided significant opportunities for agro-entrepreneurs, this could change in the near future. A 2019 study by Consumer Unity & Trust Society International (CUTS) on the opportunities and challenges that the African Continental Free Trade Area could bring concluded that the trade agreement presents a major opportunity for African entrepreneurs. However, CUTS notes that the high cost of cross-border trade is likely to continue to pose a challenge to smaller entrepreneurs, urging governments to provide infrastructural, financial and technical support and policies that would enable smaller businesses to benefit from cross-border trade as well.

Improvements in the policy environment could also spur more entrepreneurial activity. The African Centre for Economic Transformation (ACET) calls on governments to support the local fabrication of simple agricultural machinery, a trend that is already under way in countries including Ethiopia, Ghana, Kenya, Senegal, Zambia and Zimbabwe. Such support could spur greater productivity, while also enabling the rise of small and medium-sized enterprises that produce machinery or provide machinery repairs and maintenance. Other policies recommended by ACET include the development of collateral registries, which would allow for greater access to credit and increased infrastructure spending, specifically to ensure better energy availability. Solar power and mini-grid systems could provide low-cost, reliable sources of energy that would enable small-scale farmers to venture into value-added processing.

Many public and private sector initiatives that seek to affect change in the agricultural sector have included an entrepreneurial component in recent years. One example is the AGRA Smallholder Inclusive Productivity and Market Access (SIPMA) project. SIPMA includes both practical support in the form of access to crucial inputs such as seeds and fertiliser, as well as entrepreneurial skills training and record-keeping support. According to AGRA, such programmes have already resulted in greater yields and revenue.

The African Development Bank's "Feed Africa: Strategy for Agricultural Transformation in Africa 2016-25" report also includes a number of programmes that support the development of agricultural entrepreneurship in the continent. Among them is the Agricultural Subsector Development and Promotion Project in the Zaghouan Governorate in Tunisia. The project explicitly underscores the training of agricultural entrepreneurship as an important means to combat youth unemployment in the country. It aims to directly train 300 young people and reach up to 1500 people over the long term.

Private sector initiatives are also supporting agricultural entrepreneurs by supplying them with essential equipment that enable them to commercialise. "The first building blocks towards commercial farming are increasing awareness of agricultural best practices and providing farmers with the capacity to enhance productivity," Jihane Ajijti, head of strategy at OCP Africa, told OBG. With this approach in mind, the fertiliser producer started the OCP School Lab in 2016. Under the initiative, free soil analysis, technical training and customised recommendations were made available through 15 mobile-testing labs for over 400,000 farmers across seven countries in order to increase their awareness of balanced fertilisation.

The Supply Chain Picture

One of the most pervasive challenges facing farmers who seek to bring their products to market is poorly developed physical infrastructure, particularly in rural parts of Africa. Among the issues commonly faced by traders and transporters are the poor conditions of roads; high transaction costs; corruption; a lack of affordable and reliable electricity; insufficient food safety protocols; high costs of imported logistics materials; and degraded and congested wholesale markets.

Low integration of rural and agricultural areas with urban markets results in an inefficient allocation of resources and often contributes to significant post-harvest losses, particularly for more perishable products such as vegetables and fruits. Even crops such as maize and beans that can be easily stored often have high spoilage rates due to a lack of storage facilities.

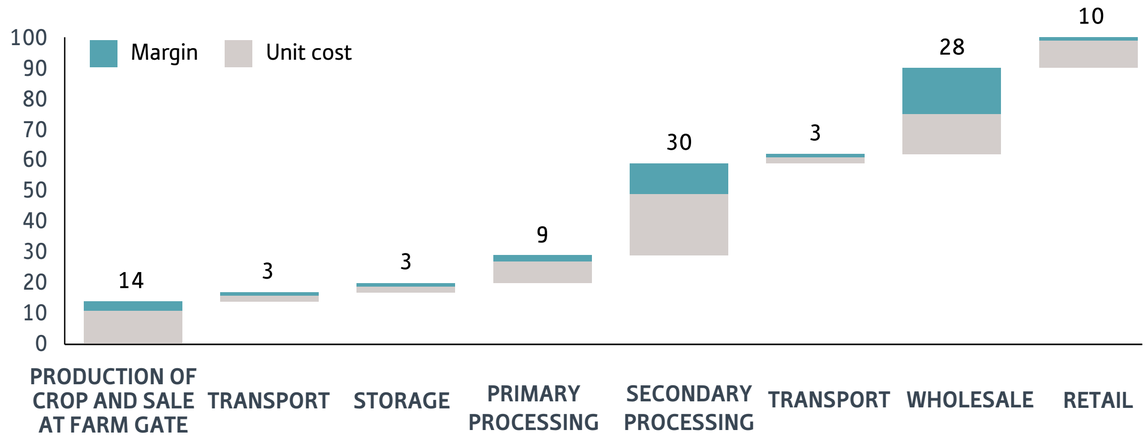
According to Kadri Alfah, CEO of the Ghana Commodities Exchange, Ghana is currently meeting 20% of its warehousing needs. The government has embarked on a warehousing expansion project, but further improvements are necessary to fight post-harvest losses.

"Improved cleaning, drying, grading and bagging equipment is required to ensure that agricultural commodities are appropriately processed and stored," Alfah told OBG. "This will not only reduce waste, but also ensure higher-quality products, better prices for farmers and lower inflation, as well as help the country to overcome issues of food insecurity," he added.

Covid-19 exacerbated this problem and highlighted pre-existing gaps. Restrictions imposed on movement within countries and on gatherings at physical markets resulted in delays and spoilage. In Burkina Faso, for example, trucks were sometimes stranded in markets due to the timing of their travel amid pandemic restrictions, leading to spoilage that discouraged farmers and left less money to invest in agricultural imports, according to the African Fertiliser and Agribusiness Partnership (AFAP).

For farmers who rely on cross-border markets, the issue remains particularly urgent. The AFAP reports that horticultural produce including mangoes, tomatoes, potatoes and onions have been found rotting at Tanzanian borders, with requirements for Covid-19 clearance certificates resulting in delays of more than seven days to transport the cargo out of the country.

Value chain of high-value export crops (%)



Graph source: *Bain & Company*

Navigating Logistical Hurdles

While Covid-19-related border closures have further complicated the ability of farmers to deliver their goods to foreign markets, the obstacles posed by politics and regulations are unlikely to disappear in post-pandemic Africa. In the "2020 Africa Agriculture Status Report" by the Alliance for a Green Revolution in Africa (AGRA), the organisation gives examples of matches between supplies and markets on the continent: surplus maize stored in South Africa could feed deficit markets throughout the south and east of the continent; extra cowpea in Niger and Burkina Faso could be exported to Nigeria, Ghana and Côte d'Ivoire; and livestock farmers in the Sahel could find buyers along the West African coast. However, much of this potential trade is not realised due to the high transaction costs associated with land border crossings and multiple checkpoints. It is hoped that the African Continental Free Trade Area, which went into force in January 2021, will reduce some of these costs, but many non-tariff barriers are likely to remain without coordinate efforts by all countries.

In the long term, there are a number of major trends expected to affect the flow of products from farm to the market – among them rapid growth in urban food demand. AGRA estimates that over 80% of the $200bn-250bn in urban food sales on the continent are currently supplied by domestic producers. With urbanisation expected to increase over the coming decades, AGRA anticipates that demand for processed, prepared and perishable food is likely to grow the fastest. As incomes rise, dairy, poultry, meat, fish and horticulture should become more important to the diets of everyday Africans. However, with greater demand stemming from urban food markets, supply lines become longer, more varied and more complex, which will make the previously outlined challenges more acute.

Nevertheless, digital technologies are offering solutions to the logistical challenges faced by farmers. In recent years, a number of agri-tech start-ups have emerged that are providing supply chain solutions, such as Twiga Foods, a mobile-based business-to-business food supply platform, and N-Frnds, a mobile platform helping smallholder and subsistence farmers communicate. With increased investment in both digital and physical infrastructure upgrades, moving agricultural products from farm to the market should become more streamlined and less costly for farmers in rural areas.

Rising to the Challenge

Although multiple obstacles have inhibited the transformation of African agricultural systems from subsistence farming into commercial-scale operations, four key areas have been identified to tackle these challenges and support development across the continent: First, increasing awareness about balanced fertilisation and soil health.

Second, facilitating farmers' access to quality products and ensuring alignment between the inputs they need and the materials they can acquire, as well as combatting falsified products that limit the availability of proper fertiliser. Third, bridging the gap between farmers and financing, given that smallholder and subsistence farmers earn relatively little and generally lack the ability to secure loans or investment. Fourth, boosting farmers' abilities to sell their products on the market in a manner that reduces costs and increases returns, as this is a common stumbling block even for producers with high yields. Indeed, as a result of logistics and distribution problems stemming from insufficient road, ports and other infrastructure, African farmers face the highest farm gate fertiliser costs in the world and some of the lowest profits on the sale of their products.

Solutions are emerging that can help meet these goals, often guided by the most urgent requirements voiced by African farmers. "Any initiative that aims to achieve agricultural improvements has to put the farmer at the heart of the programme and start from a deep understanding of farmer needs," Aniss Bourraqadi, head of agronomy at OCP Africa, told OBG. "Whatever innovative initiatives are introduced, if they are not adopted by the farmer, they will not have a lasting and sustainable impact."

According to Bourraqadi, the continent's diverse soil and plant needs pose a hurdle to agricultural transformation and limit the benefits of one-size-fits-all initiatives. Tailored interventions are therefore needed to most effectively improve different growing environments. In Nigeria, Ghana, Ethiopia, Cote d'Ivoire and other countries, OCP has local agronomic teams that are in touch with domestic stakeholders such as NGOs, governments, farmer associations, universities and research institutes. Through those collaborations, the company has carried out extensive soil mapping: as of early 2021, 25m ha of African soil had been digitally mapped and 5000 field trials conducted to provide farmers with site-specific solutions.

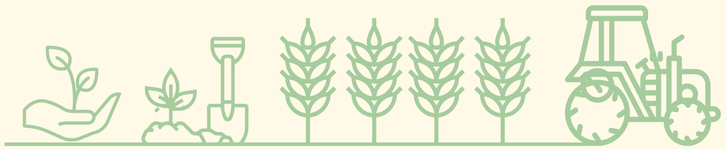
25m ha
of soil digitally mapped

5000 field trials
conducted

Programmes in Practice

Agribooster initiative

- First launched as a pilot programme in Côte d'Ivoire
- Connects farmers to markets, finance and insurance
- Trains local extension agents on good agricultural practices
- Collaborates with other providers to ensure they have the right inputs to be successful
- Provides training on the type and volume of fertiliser needed for various crops and soil types



Efforts have resulted in customised fertiliser formulas that take soil and plant needs into account, improving yields for both subsistence crops like maize and rice, as well as cash crops. "Our research has shown that there is great potential for crops that are not necessarily linked to food security, but could allow high returns for African farmers," Bourraqadi told OBG. These include cashew nuts, oil palm, cocoa and cotton, which have high potential as commercial and export crops in countries such as Mali, Burkina Faso, Côte d'Ivoire and Chad.

This approach is also applied to Nigeria. OCP initiatives in the country include the Agribooster and Agripromoter programmes, which aim to improve the whole value chain by supporting access to financial services, high-quality inputs and markets, as well as providing technical training. Agripromoter has a specific focus on ensuring last-mile delivery, although the programme also provides employment to extension agents.

"Our involvement in Nigerian agriculture focuses on enabling the expansion of the entire market space and elevating the industry," Mohamed Hettiti, managing director of OCP in Nigeria, told OBG. "By increasing the amount of research and development activities, improving logistics and providing business development programmes that are farmer-centric, we believe we can grow not just the agriculture sector but the entire Nigerian economy." With Covid-19 complicating the ability to disseminate information and carry out programmes as intended, a new initiative was formed in 2020. OCP leveraged digital media to share an informative TV show in Nigeria, *Farm and Fortune*, covering fertiliser recommendations, and soil testing and analysis. If this and other efforts show results, campaigns will be scaled up and replicated in other markets.

Infographic source: *OCP Group*

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