People, Health and Nature:

A Sub-Saharan African Transformation Agenda



The Food and Land Use Coalition

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Foreword



Agnes Kalibata President, Alliance for a Green Revolution in Africa

(AGRA)

Africa is on the move. I am optimistic about Africa's development following two decades of growth and improvements in the economy and people's livelihoods. This has been powered in part by steady growth in the agriculture sector, spurred by innovative technologies such as improved seeds and digitization.

Sustained agricultural transformation in Africa is at the heart of the region's continued growth and stability. In addition to assuring food security for all, the agriculture sector is a source of employment for the majority of the population, across many value chains. It is a source of raw materials for many industries and empowers the poor and marginalized in multiple and diverse local contexts. Over the years, the Alliance for a Green Revolution in Africa (AGRA) has invested in equipping farmers with the means to sustainably boost production and gain access to rapidly growing markets, with a focus on increasing incomes and improving food security, while at the same time driving broader economic growth.

Improvements in efficiency and safety across valuechains, including the integrated planning of land and other resources, boosts the value of African produce and generates employment opportunities for the young. We can see that our work and that of our partners, including those in the Food and Land Use Coalition, has eased the ever-growing pressures on farming systems to provide for rapidly growing populations.

At this crucial moment, when we are grappling with the consequences of global heating and climate emergencies, **we must take a climate driven view of this agriculture transformation.** At a minimum, this must be done to bolster the resilience of African economies, improve livelihoods, generate opportunities for farmers and secure the region's nutritional outcomes. Thriving ecosystems can help to reduce climate related risks such as impacts of flooding, drought and soil erosion, which are forecast to rise. Halting deforestation, promoting reforestation and encouraging regenerative activities can play a critical role in restoring land, boosting yields and improving livelihoods. Beyond increasing resilience, we should take this approach because it is the right thing to do, in accelerating sustainable agricultural development overall.

We have never been better-equipped to deliver such a transformation. The unprecedented growth and adoption of digital technologies, and the convergence of well-being agendas for both people and planet, globally and locally, offer many opportunities to adopt sustainable farming practices, increase value-chain transparency and support restoration efforts. For example, AGRA has been promoting a private sector approach through its network of partners that has seen transformation in seed systems at country level. This makes locally adapted seeds accessible, strengthens rural economies, builds food security and increases the resilience of communities and countries.

Over the past few years, AGRA has been supporting African governments to deliver on their agricultural development plans through targeted capacity building initiatives. These have supported policies and strategies that are in turn implemented to drive investments in the sector.

The work of the Food and Land Use Coalition is galvanising partners and stakeholders to converge around this important agenda in an effort to contribute to sustainable food systems around the world. This paper is therefore timely. It provides critical insights into a framework for an integrated, inclusive transformation and outlines what is needed to turn ambition into reality. By championing the recommendations outlined in the paper, policy-makers, business leaders, farmers, investors and civil society groups can broaden the space for action, maximise investments and achieve the scale required to drive meaningful impact. The time for action is now – we have the know-how, the people and the ambition to work together to build a sustainable future for all. The resilience of Africa's smallholder farmers is essential to accelerating our path to prosperity. With the right policies, programmes, financial instruments, investments and skills, smallholder farmers will boost yields, regenerate natural capital and prosper. Our food systems will become more sustainable and nutritious and we can imagine achieving our great ambition of a prosperous Africa capable of feeding itself and the world.

alisata

Agnes Kalibata President, Alliance for a Green Revolution in Africa

(AGRA)

Executive summary

Around the world, major economies have demonstrated the benefits that are unlocked when food and land use systems thrive. Brazil's agricultural sector drove strong economic growth and transformed the country into a net exporter and global player in agribusiness.¹ India's "Green Revolution" saw cereal yields more than double and rural poverty decline by over 25 per cent in thirty years.² Today, sub-Saharan Africa has a unique opportunity to replicate this growth, while avoiding pitfalls like massive environmental degradation and rising inequality that have historically accompanied such transitions.

Food and land use systems are integral to sub-Saharan Africa's economy. They account for 70 per cent of livelihoods and almost one-quarter of countries' GDP in the region (up to 60 per cent in some countries).³ Yet crop yields across Africa are only 25 per cent of their potential, indicating that massive society-wide gains could be attained if these are sustainably raised.⁴ Much of the value created by the sector does not remain in the region, nor do primary producers receive their fair share: cocoa farmers in Côte d'Ivoire and Ghana earn ~US\$0.75 per day⁵ despite cumulatively producing 60 per cent of cocoa for the US\$50 billion/year chocolate industry.⁶

There is a huge economic opportunity in a sustainable and equitable food and land use future in sub-Saharan Africa. A critical component is reducing "hidden costs" to sub-Saharan Africa's economy estimated at US\$680 billion (US\$1.9 trillion when using global GDP figures) per year.⁷ (See Exhibit ES-1.) In addition, they are hindering efforts to deliver on the Sustainable Development Goals and Paris Agreement on Climate. Such hidden costs include environmental damage, the cost of poor dietrelated population health and the impacts of entrenched and worsening inequality and rural poverty. Analysis for this report estimates the biggest of these costs today are:

- US\$270 billion in the cost of greenhouse gases (GHG) released by sub-Saharan Africa's food and land use sectors.⁸ The biggest driver of this is deforestation: today, sub-Saharan Africa loses 2.7 million hectares of forest each year, contributing over 1600 million tonnes (Mt) CO2e to global GHG emissions.^{9*}
- US\$140 billion as a result of irreversible environmental degradation. Land degradation causes damage to soils and water, compromising agricultural yields and eroding sub-Saharan Africa's ability to benefit from vital ecosystem services. The costs associated with water scarcity are also significant.
- US\$90 billion from undernutrition. Child undernutrition contributes to just under 700,000 deaths every year and causes reductions in productivity due to illnesses and development challenges.
- US\$80 billion in the cost of inadequate rural livelihoods. By failing to provide a decent living for 350 million people working in rural areas, unsustainable food and land use systems trap them in poverty.

* The FOLU Hidden Costs are modelled using FAO forest cover data which has been calibrated with the Hansen Forest Cover Dataset (Hansen et al., Science 2013). This results in total AFOLU emissions forecasts which are higher than other commonly cited estimates (IIASA, IPCC), due to the Hansen dataset methodology for estimating forest cover loss. More information can be found in the FOLU Technical Annex, published September 2019.

The Hidden Costs of Food and Land Use Systems in sub-Saharan Africa in 2018



Billions USD, 2018 prices

This is a conservative estimate, representing the hidden cost to sub-Saharan Africa's economy by utilising sub-Saharan African GDP per capita figures. Using a global GDP figure instead means the hidden costs increase up to US\$1.9 trillion. Under this scenario, the costs of undernutrition are ~10 times larger, indicative of the huge economic opportunity that reducing malnutrition across the region will have for sub-Saharan Africa and the world.

Without intervention, these hidden costs will spiral upwards over the coming decades. Sub-Saharan Africa's population is forecast to double to over two billion by 2050.¹⁰ While this is a massive growth opportunity, it will result in burgeoning demand for food, (often wood) fuel, land and jobs, increasing pressure on already vulnerable natural resources. Modelling for this report suggests that sub-Saharan Africa could lose over 70 million hectares of forest by 2050 – an area one-third of the size of DRC.¹¹ The cost of this natural capital loss could be up to US\$170 billion per year.¹²

The impacts of climate change will weigh more heavily on countries in the region than almost anywhere else in the world: crop losses of up to 30 per cent are possible with warming of 2°C by 2050, increasing food insecurity and the potential for conflict and migration.¹³ An expanding middle class and urbanisation are prompting dietary and lifestyle shifts, adding the health costs of obesity to the burden of malnutrition in many countries. A growing population will result in a huge increase in the costs of rural poverty: sub-Saharan Africa could be home to 90 per cent of the global extreme poor by 2030 due to a combination of slow poverty reduction and rapid population growth relative to the rest of the world.¹⁴

Clearly, there is an urgent imperative to address these rising hidden costs. Yet this is only part of the story. Shifting to more sustainable food and land use systems in sub-Saharan Africa also represents a significant economic opportunity with the potential for huge new markets across the region.



New business opportunities in sustainable food and land use systems have been estimated at US\$320 billion each year by 2030 across sub-Saharan Africa.¹⁵ These opportunities deliver multiple co-benefits, from reducing rural poverty to boosting food security and improving population health, to protecting and regenerating natural capital.

These opportunities are:

- US\$120 billion¹⁶ in forest ecosystem services (sustainable forestry management approaches and payment mechanisms for ecosystem services) and restoring degraded land (conservational farming practices and landscape interventions such as terracing and replacing topsoil).
- US\$100 billion¹⁷ in increased agricultural yields: putting high-quality inputs, innovation, technology and infrastructural improvements to work on both small and large farms across the region.
- US\$100 billion¹⁸ in supply chain efficiency improvements (improved food transport, storage and refrigeration to reduce food loss and waste) and enhanced value-adding capacity (increased processing, packaging and retailing capacity).

The potential to create better jobs in these new markets is significant. Modelling completed for this report finds that sustainable food and land use systems in sub-Saharan Africa could generate 40 million additional decent jobs in the region and cause rural incomes to rise by an extra 3 per cent by 2030. This would go some way in helping to meet the job demands of 375 million Africans who are set to reach working age between 2015 and 2030 – less than a quarter of whom are currently forecast to find formal wage employment.¹⁹

Expanded intra-regional trade will help to accelerate these market opportunities across sub-Saharan Africa, while reducing the region's net agricultural trade deficit. Today, intra-regional trade in sub-Saharan Africa (for example, between Tanzania and Uganda) makes up just 23 per cent of food imports and 26 per cent of food exports – in contrast to 35 per cent and 57 per cent in developing Asian economies.²⁰

Technological innovations are central to all new markets. There will be almost 700 million smartphone connections in the region by 2025, 400 million more than at the end of 2017.²¹ Entrepreneurs are finding new business models and ways of sharing knowledge that meet the needs of an increasingly connected population and solve some of the region's greatest challenges: boosting agricultural yields, connecting value chain actors to markets and improving monitoring capacity (See Exhibit ES-2.).

Technological advances in food and land use systems

Access to	Extension	Access to	Improving	Access to Markets	Monitoring value
information	Services	machinery	on-farm practices	and Finance	chains
Esoko sends SMS messages with market prices to cocoa farmers in West Africa In Ethiopia, CommonSense provides farmers with weather forecasts via SMS	Farmerline leverages digital technology to increase the scope of extension services AgTube is an online platform for agricultural researchers and farmer organisations	Hello Tractor the 'Uber of Farming in Africa' iProcure links farmers to manufacturers to buy agricultural inputs with mobile vouchers	SunCulture provides solar-powered drip-irrigation for farmers Fresh Direct uses hydroponics and vertical farming to grow crops in urban areas	mPesa broadens financial inclusion in Kenya Nigerian start-up FarmCrowdy connects farmers with potential investors	Global Forest Watch Pro matches thousands of data points representing users' supply chain investments with data on recent and historic deforestation to reduce risk

However, implementing the reform and innovation needed to reduce hidden costs and capture new business opportunities in food and land use systems is not going to be easy. Trade agreements and regulations need to be integrated into land use plans to balance demands on the region's natural capital and consider the impacts of trade policy on nutrition, while ensuring that sub-Saharan African countries secure a fair deal in trade negotiations.²² Over the past two decades, Africa's trade with China, India and other emerging partners tripled (from ~US\$250 billion to ~US\$800 billion per year between 2000-2016).²³ Despite opening up huge opportunities, this has increased pressure on the region's natural resources, as demand for produce and land has grown.

Unsustainable agricultural subsidies need to be redirected. For example, Malawi spends 70 per cent of its agricultural budget on subsidies that do not reach the poorest farmers, disincentivise the use of organic-based materials,²⁴ crowd out key parts of the private fertiliser market and divert spending from other programmes, including roads and extension services.²⁵

Improving the infrastructure that supports sustainable food and land use activities is another critical action. This includes reductions in post-harvest losses, large-scale productivity improvements and the development of domestic food markets (which require better roads, electrification and storage infrastructure, as well as communication and health services). Limited access to electricity enforces a dependence on fuel wood, a major driver of deforestation in many countries in the region. Attaining the infrastructure quality and quantity of the rest of the developing world could increase growth in GDP per capita by between 1.7 per cent and 2.6 per cent per year.²⁶

Improving institutional capacity is essential to enact reforms and attract investment into and from within the region. Historically, low institutional capacity – particularly at local levels – has deterred investors, weakened the enabling business environment and undermined the consistent implementation of laws and policies. Entrenched inequalities must also be addressed. Insecure land tenure – particularly for women – limits farmers' and rural communities' access to finance, as well as increasing the risks of investing in land or adopting sustainable management practices. Analysis for this report finds that the additional investment required for key reforms to 2030 is modest compared to the benefits: an estimated additional US\$85-100 billion per year.* The majority of this will be directed into rural infrastructure, equipping farmers to improve yields and restoring natural capital (including forests and other ecosystems, such as savannahs and wetlands). Although an additional US\$85-100 billion investment may be small compared to the size of the global economy, it is equivalent to 5 per cent of sub-Saharan Africa's GDP²⁷ and just under triple annual FDI into the region across all sectors, which has been on average US\$36 billion over the past decade.²⁸

As one of the most underinvested regions in the world, increasing investment from inside and outside sub-Saharan Africa is not without its challenges. Concessional capital will need to be used more catalytically to mitigate credit, political and technological risks to rapidly crowd private investment into priority sustainable food and land use assets in the region. Capitalising intermediaries like microfinance institutions and other value chain actors will also be critical to support hard-to-reach smallholders. Aggregating small-scale projects into larger blended finance vehicles with higher liquidity, possible downside protection and technical assistance can help to attract mainstream capital from larger investors. Finally, increasing local currency finance and mobilising resources from domestic capital markets will be key as they improve their understanding of risks in the sector.

How can countries in sub-Saharan Africa address these challenges to capture the opportunity of a sustainable food and land use future? Our work has identified four critical transitions in food and land use systems with the potential to deliver outsized impact in sub-Saharan Africa and the wider world. Section 2 of this report is about *how* to drive these transitions at speed and scale.

The transitions are:

1

Equipping farmers to sustainably increase nutritious agricultural yields. Providing farmers with access to high-quality inputs, training and affordable capital to invest in their land could help to dramatically increase agricultural yields, enhance the availability and affordability of food and improve farmer incomes and livelihoods. Sustainable farming practices and technology-enabled agriculture can reduce agricultural emissions and boost biodiversity on farms at the same time as increasing nutritious yields. For example, nonprofit Technoserve partnered with Equator Seeds to use drones in Uganda to monitor and optimise agricultural practices across 270 farms to deliver 100 per cent yield increases, 60 per cent declines in pesticide use, and greater profits for both farmers and the seed company. 2

Strengthening local markets for nutritious, sustainably produced food for domestic and international

consumers. Africa's food and beverage markets could be worth US\$1 trillion by 2030.²⁹ By investing in supply chain improvements and unlocking technology to increase efficiency and boost value-adding and intra-regional trade opportunities, countries can meet growing food demand, improve farmer incomes, generate new jobs, displace food imports and support population health. Investing in human capital will help to equip a new generation of entrepreneurs to enter agriculture. Already, progress is being made. For example, Rwanda has risen to 29th out of 190 countries in the "Doing Business" Index – and increased investment has followed.³⁰

This figure is based on modelling and estimates conducted for the Food and Land Use Coalition global report. This is a conservative estimate because it is based on cost categories that are priorities for global transformation. The need for a disproportionate focus on sub-Saharan Africa has been recognised in certain areas – for example, investment in rural infrastructure – yet additional investments will need to be made in the region that are not included in these estimates, such as local processing activities. In addition, the costs are based on assumptions around the extent of the transformation that can be achieved by 2030: further investment will be required to achieve transformation by 2050. See Technical Annex for more detail.





3

Working at the landscape level to preserve and grow

natural capital. Halting deforestation and reversing loss of natural capital could increase resilience to climate change, reduce annual GHG emissions by 2000 MtCO2e from these sources by 2050 and support millions of people to improve their livelihoods.³¹ Landscape-level interventions can have multiple co-benefits, such as the Great Green Wall Initiative, an African-led initiative aiming to restore 100 million hectares of currently degraded land in the Sahel. It aims to generate 10 million jobs, boost food security and sequester 250 million tonnes of carbon by 2030. 4

Capturing gains from equal rights. A transition to equal and inclusive food and land use systems will take efforts on multiple fronts to confront today's inequalities. Such a transition would remove barriers for young people to enter the agricultural industry and see farmers capture an increased share of the value generated by their produce, reaping the benefits of higher agricultural production and stronger markets emerging in countries like Ghana. It would ensure that women have equal access to resources including property, finance and education to realise their full productive potential and support nutritional and health outcomes. This transition also tackles inequality between sub-Saharan African food and land use actors and their partners abroad, increasing the benefits of engaging in international markets.



A set of specific actions will help to progress these four individual transitions towards sustainable food and land use systems. However, some shifts have much wider scope, with the potential to deliver gains across all four transitions. Section 3 of this report covers these wider shifts, including: accelerating the demographic transition to stable fertility rates; recognising and promoting farmer and community rights and responsibilities over land; improving infrastructure, particularly in rural areas; and removing barriers to investment across food and land use systems.

Progress in each critical transition is already underway. Actors from government, business, development and private finance, civil society and farmers themselves are already showing the world what success looks like. For example, under its Climate-Resilient Green Economy initiative, the Ethiopian government aims to drive economic growth to reach middle-income status by 2025, while limiting 2030 GHG emissions to around 150 MtCO2e – less than half the estimated emissions under a conventional development path. (See 1 in Case Study Catalogue.) Myriad more examples of such progress are documented in the Case Study Catalogue.

Now, fundamental shifts in policy, levels of investment and implementation capacity must broaden the space for more people and projects to thrive. Governments need to create the enabling environment, but the private sector, the finance community and civil society all have a role to play. Critically, this work must be led by and build on the expertise and experience of Africans themselves. Sub-Saharan Africa's entrepreneurs, farmers and communities can work with partners at home and abroad to develop solutions, build capacity, implement action and set the region on a course for strong, sustainable economic development.

The next decade is critical. Global and regional trends are putting new pressures on food and land use systems. But the potential for transformation has never been greater. Technological innovation is taking off, particularly given the rapidly rising connectedness of the region. Promising new partnerships are being forged between sub-Saharan African countries and the rest of the world. This report demonstrates that, for all actors, opportunities in food and land use systems represent some of the best investments to deliver sustainable, equitable growth across the region, with implications for the wider world. They are also critical to deliver on the Sustainable Development Goals and Paris Agreement on Climate. The time to act is now.

Section 1:

A crucial decade for food and land use in sub-Saharan Africa



Food and land use systems^{*} are an integral part of sub-Saharan Africa's economy. However, these come with significant hidden costs, estimated at US\$680 billion.

Hidden costs include those linked to poor population health, environmental damage and the impacts of entrenched and worsening inequality and rural poverty. These costs are rising with global and regional environmental and socio-economic trends. For example, unsustainable agricultural practices and climate change are undermining the productivity and resilience of rural landscapes and causing deterioration that could become irreversible. Addressing hidden costs through a transition to sustainable food and land use systems is a huge economic opportunity. What's more, it is critical to deliver on the Sustainable Development Goals (SDGs) and Paris Agreement on Climate.

There are also many reasons why such a transition may be more possible than ever before – the spread of existing technologies, the potential for further innovation, increased regional and global collaboration to name a few. Moreover, these developments point to new business opportunities in sustainable food and land use systems, estimated at US\$320 billion each year by 2030 across sub-Saharan Africa.³²

This is a unique moment. Forward thinking local and international governments, investors, businesses and local communities will take up the challenge before this window of opportunity closes for good.

^{*} Food and land use systems include everything involved in the way that land is used and food from land and sea is produced, stored, packed, processed, traded, distributed, marketed, consumed and disposed. It includes the social, political, economic and environmental systems which influence and are influenced by those activities.

The hidden costs of food and land use systems in sub-Saharan Africa

The hidden costs of food and land use systems in sub-Saharan Africa are dominated by the impact of environmental damage – estimated to have cost the region over US\$410 billion in 2018 (in local values).³³

(See Exhibit 1.) The most significant of the region's environmental hidden costs is the global damage caused by climate change as a result of greenhouse gas (GHG) emissions (carbon, but also methane). Food and land use systems contribute to GHG emissions through land use change (deforestation, the loss of other valuable biomes and afforestation), farming (the use of fertilisers and methane emissions from cattle) and the agricultural supply chain.

EXHIBIT 1

The Hidden Costs of SSA Food and Land Use Systems in 2018



Billions USD, 2018 prices

This is a conservative estimate, representing the hidden cost to sub-Saharan Africa's economy by utilising sub-Saharan African GDP per capita figures. Using a global GDP figure instead means the hidden costs increase up to US\$1.9 trillion. Under this scenario, the costs of undernutrition are ~10 times larger, indicative of the huge economic opportunity that reducing malnutrition across the region will have for sub-Saharan Africa and the world.

Emissions from sub-Saharan Africa are predicted to increase. The region hosts 20 per cent of the world's rainforests, and their protection is critical to curb GHG emissions. Yet rates of deforestation are high and increasing. (See Exhibit 2.) If trends continue, sub-Saharan Africa could lose over 70 million hectares of forest by 2050 – an area one-third of the size of DRC.³⁴ Shifting agriculture - both small-scale, 'subsistence' and commercial or commodity-driven - is a major driver of deforestation in the region.³⁵ The cocoa sector has been the primary driver of deforestation in Ghana and Cote d'Ivoire, which saw the highest increase in per cent of primary loss between 2017 and 2018 – to 60 per cent and 27 per cent respectively.³⁶ Furthermore, as demand for food increases, modelling for this report indicates that annual direct agricultural emissions in the region will grow by almost 25 per cent to over 500 MtCO2e by 2050.³⁷



Tree cover and tree cover loss, sub-Saharan Africa, 2000-2018

Source: Global Forest Watch, 2018. Available at: https://www.globalforestwatch.org/

Natural capital degradation (water scarcity, land degradation, biodiversity loss and over-exploitation) costs sub-Saharan Africa US\$140 billion each year.³⁸ These costs represent lost yields due to soil erosion and the lost value of ecosystem services from reduced biodiversity; the cost of water scarcity and the related loss of ecosystem services; and the cost of over-exploiting natural food resources, including pollinator services and global fishing stocks.

With increasing global warming, these costs will only increase. The effects of climate change on flood and drought risk, agricultural productivity and the spread of disease are forecast to be profound in sub-Saharan Africa – particularly in arid and semi-arid Sahelian countries, such as Mali, Chad and Niger. Crop losses of up to 30 per cent are possible with warming of 2°C by mid-century (not including the effects of technological advances).³⁹ (See Exhibit 3.). These dynamics increase the risk of food insecurity, conflict and migration, as competition for resources intensifies.

EXHIBIT 3

2050 projected changes in agricultural yields in 2050, given agricultural practices and crop varieties



Source: Müller, C. et al. (2010) Climate Change Impacts on Agricultural Yields, Background Paper. Potsdam: Potsdam Institute for Climate Research (PIK). Available online at: Sources: https://siteresources.worldbank.org/INTWDR2010/Resources/5287678-1255547194560/WDR2010_BG_Note_Mueller.pdf Health costs linked to consumption and production practices cost sub-Saharan Africa over US\$150 billion each year in lost productive life. Not only does undernutrition – which makes up US\$90 billion of these costs – result in significant human suffering, it also results in a significant loss of productivity each year, due to the impacts of childhood wasting, stunting and underweight on the health and life expectancy of the population.

Other health related impacts of sub-Saharan Africa's agricultural sector cost the region US\$60 billion each year.⁴⁰ This includes US\$35 billion from emerging costs linked to production processes (including pesticide residues in field crops) and US\$11 billion from diseases associated with air pollution, largely driven by the impact on household air pollution from solid fuels, indicating the importance of reducing dependence on wood fuel for energy generation. Finally, obesity costs the region over \$14b, with particularly high costs where rates are highest, such as South Africa, Namibia, Botswana and Gabon.

The hidden costs of dietary-related population health are set to rise. While overall malnutrition^{*} has declined across the region since 2000, in the years since 2015 it has begun to increase again, a trend linked to climate-related extreme weather events and conflict.⁴¹ Severe and moderate food insecurity (which has significant impacts on malnutrition and child stunting) has risen from 55 per cent to over 58 per cent in the last five years.⁴²

Furthermore, an expanding middle class, urbanisation and the influx of cheap, unhealthy foods are prompting dietary and lifestyle shifts that add the cost of obesity to the burden of malnutrition. The costs of Type II diabetes – linked to imbalanced diets and rising overweight – could rise to US\$35-59 billion by 2030.⁴³ Gabon, Botswana, Swaziland and Namibia are all experiencing increases in overweight and obesity, alongside high rates of undernutrition. Increasing the availability, affordability and appeal of nutritious foods will be critical to curb this trend.

Economic costs across food and land use systems in sub-Saharan Africa amount to US\$120 billion each year.⁴⁴ Just under two-thirds of these costs represent the impact of inadequate rural livelihoods: by failing to provide a decent living for 350 million people working in rural areas, unsustainable food and land use systems trap them in poverty. The other US\$40 billion represents the value of food that is lost and wasted, as well as the bio-nutrients that are squandered as a result of fertiliser leakage in the region each year.

These costs are amplified due to the chronic underfunding of rural infrastructure in sub-Saharan Africa. Today, rural dwellers in the region have poor access to key infrastructure like roads, electricity and the internet. There are 600 million sub-Saharan Africans without reliable access to electricity despite the enormous benefits it brings.⁴⁵ An estimated US\$30-36 billion is needed each year to improve infrastructure across the region by 2030 – including access to electricity for all and enhanced access to roads and the internet.⁴⁶ Further investments will be required to secure universal access to roads and the internet by 2050.

All hidden costs linked to food and land use systems will be impacted by rapid population growth. Sub-Saharan Africa's population is forecast to double to over two billion by 2050 – accounting for over half the forecast global increase.⁴⁷ The region also has the world's highest urbanisation rate, prompting massive shifts in diets, lifestyles and resource pressures.⁴⁸ Over half the population – 800 million people – is set to live in urban areas by 2050, often concentrated in one massive 'megacity' per country. (See Exhibit 4.)

* Malnutrition results from eating a diet in which one or more nutrients are either not enough or are too much such that the diet causes health problems. This can include undernutrition, overweight, obesity and micronutrient deficiencies.

Forecast total and urban population change, 2018-2050



Source: UN World Population Division, 2019. Available online at: https://population.un.org/wpp/Graphs/Probabilistic/947

While a rising population is a massive growth opportunity, the increased demand for food, (often wood) fuel and land will place unprecedented pressures on natural resources, causing environmental and population health costs to rise.

At the same time, population growth generates greater demand for more good jobs. Creating opportunities for prosperous livelihoods in food and land use systems is critical to reverse the growing numbers of people in poverty and associated rural welfare costs: if current trends continue, the region will be home to 90 per cent of the global extreme poor by 2030.⁴⁹ Less than a quarter of the 375 million Africans entering the labour force by 2035 are forecast to find formal wage employment, adding millions to the cost of rural poverty.⁵⁰

Population growth will be rapid across sub-Saharan Africa. Yet just six countries – Nigeria, DRC, Ethiopia, Tanzania, Uganda and Kenya – will account for half of the region's forecast growth to 2050.⁵¹ In these countries, hidden environmental, rural welfare and population health costs will see the largest increases. Furthermore, when the impacts of population growth, food security and climate change collide, their effects are amplified. (See Box 1.)

BOX 1

Sub-Saharan Africa's rising agricultural trade deficit

Mounting food demand is currently unmatched by productivity improvements or value-adding capacity in sub-Saharan African countries. This is causing the region's agricultural trade deficit to rapidly rise, resulting in extremely high sensitivity to food prices.⁵² Any shock to these prices, such as a sudden decline in food exports from the region's trade partners, means that hundreds of millions of people may struggle to afford the food they need to survive. Unfortunately, such a "price shock" scenario is increasingly likely given the impacts of climate change on agricultural productivity across the globe.

Limited institutional capacity – particularly at local levels – has deterred investors, weakened the enabling business environment and undermined the implementation of laws and policies, all of which might otherwise reduce hidden costs. In their absence, these costs will rise. For example, even with advanced land use planning and the expansion of conservation areas, deforestation rates may continue to accelerate due to limited capacity to enforce laws on-theground.

Business-friendly policies and regulations in Rwanda, Kenya and Malawi are undergoing much-needed improvements. (See 2 in Case Study Catalogue.) Yet thirty of the fifty countries with the lowest World Bank "Doing Business" scores globally are in sub-Saharan Africa.⁵³ This means that the region does not benefit from private sector expertise in value chain development and product reformulation, which – if coupled with the right policies – could support better nutritional outcomes.

Insecure land tenure – particularly for women – limits farmers' access to finance and increases the risks of investing in land or adopting sustainable management practices. Without the means to invest in the future value of their agricultural output and land, farmers are trapped in poverty, contributing to hidden rural welfare costs in the region.

Emerging opportunity

Clearly, there is an urgent imperative to address these rising hidden costs. Yet this is only part of the story. Shifting to more sustainable food and land use systems in sub-Saharan Africa also represents a significant economic opportunity, with the potential for huge new markets across the region.

EXHIBIT 5

The Business and Sustainable Development Commission (BSDC)'s estimates of food and land use system business opportunities



Billion USD (2015 USD)

New business opportunities in sustainable food and land use systems across sub-Saharan Africa have been estimated at US\$320 billion each year by 2030.⁵⁴ (See Exhibit 5.) The biggest of these is the opportunity for sustainable forestry management approaches. When combined with new payment mechanisms for ecosystem services (including global climate change mitigation, watershed services and biodiversity conservation), these could be worth around US\$100 billion each year by 2030. Another key opportunity is low income food markets (almost US\$70 billion each year by 2030). By investing in increased productivity, supply chain improvements and food innovation, consumer goods companies could make available food products that are more nutritious and accessible for a growing population.

These opportunities arise for a multitude of reasons. For one, a market of 850 million new consumers by 2030 creates remarkable opportunities for ambitious entrepreneurs, established local players and international businesses alike.⁵⁵ Furthermore, the increased investment into rural infrastructure required to reduce the hidden cost of rural poverty opens up opportunities for business that were previously impossible to access – including new markets and improved capacity to support value-adding activities. Another significant reason is the emergence of business-friendly policies and regulations in countries including Ghana and Zambia, as mentioned above.

Now is also a critical time to shape socio-economic trends. For example, dietary shifts towards less diverse, unhealthy foods are only just taking off. Businesses that develop healthy, sustainably produced food brands can prevent the advance of dietary shifts, before habits and markets are cemented. A resurgence in indigenous foods – such as fonio, the super-nutritious ancient Sahelian grain that is being cultivated for domestic and export markets by Yolélé Foods – is leading to opportunities for the development of food brands for consumption at home and for export.

What's more, technological innovations will transform food and land use sectors across sub-Saharan Africa. They are already creating unprecedented capacity to boost agricultural yields, connect value chain actors to markets and improve monitoring capacity.⁵⁶ Entrepreneurs are deploying new technology to support innovative business models and ways of sharing knowledge that can meet the needs of an increasingly connected population. (see Exhibit 6.) These market leaders will benefit from further advances: there will be a forecast 700 million smartphone connections in the region by 2025, 400 million more than at the end of 2017.⁵⁷

EXHIBIT 6

Technological advances in food and land use systems

Access to	Extension	Access to	Improving	Access to Markets	Monitoring value
information	Services	machinery	on-farm practices	and Finance	chains
Esoko sends SMS messages with market prices to cocoa farmers in West Africa In Ethiopia, CommonSense provides farmers with weather forecasts via SMS	Farmerline leverages digital technology to increase the scope of extension services AgTube is an online platform for agricultural researchers and farmer organisations	Hello Tractor the 'Uber of Farming in Africa' iProcure links farmers to manufacturers to buy agricultural inputs with mobile vouchers	SunCulture provides solar-powered drip-irrigation for farmers Fresh Direct uses hydroponics and vertical farming to grow crops in urban areas	mPesa broadens financial inclusion in Kenya Nigerian start-up FarmCrowdy connects farmers with potential investors	Global Forest Watch Pro matches thousands of data points representing users' supply chain investments with data on recent and historic deforestation to reduce risk

Finally, increased local and global cooperation within sub-Sahan Africa and with partners beyond is a sign of significant progress. At a regional level, mechanisms for regional collaboration – including the African Union's Agenda 2063, the Comprehensive Africa Agriculture Development Plan (CAADP) and the Continental Free Trade Area (CFTA) – provide opportunities to collectively raise ambition, increase negotiating power, and deliver action across national boundaries. Partnerships are emerging that commit unprecedented levels of investment and engagement in the region – not least, the Marshall Plan with Africa. (See Box 2.)

BOX 2

Marshall Plan with Africa

The Marshall Plan with Africa is a political initiative spearheaded by the German government, which seeks to support African governments to deliver on the Agenda 2063. (See 3 in Case Study Catalogue) The Plan seeks to develop a shared vision for the future between Europe and Africa, with agreements and investments to support this. Priorities include boosting jobs and opportunities for young people, investing in entrepreneurship, boosting value-adding activities in the region and reforming trade at international levels to create equitable outcomes for all. The Plan emphasises the need for African solutions to meet Africa's challenges, while recognising the need for unprecedented international action and investment to secure the future prosperity and stability of Africa and the wider world.⁵⁸

The next decade is critical. The challenge is to harness the new opportunities that global and local trends create and combine them with the right "enabling environment" – the fundamental reforms, policies, incentives and increased investment that allow a shift to sustainable food and land use systems to scale across the region.

The subsequent section sets out four critical transitions in sub-Saharan Africa to deliver gains for the economy, environment and human health, and returns on investment. Within each transition are a set of actions for international and domestic governments, businesses, entrepreneurs, civil society and engaged citizens alike.

Section 2:

Four Critical Transitions for Sustainable Food and Land Use Systems in sub-Saharan Africa



Critical Transition 1:

Equip farmers to sustainably increase nutritious agricultural yields

Sustainably boosting agricultural productivity in sub-Saharan Africa is a huge opportunity. As shown in Section 1, there is a US\$50 billion prize in leveraging technology to boost yields on small and large farms.⁵⁹ Similarly, there is opportunity in reducing the US\$150 billion in annual hidden costs linked to under-nutrition and unsustainable agricultural practices.⁶⁰ Today, yields of the main cereal crops are only 15-30 per cent of their potential and production increases have largely been driven by agricultural expansion.⁶¹ (See Exhibit 7.) Transitioning to regenerative agricultural practices coupled with technological innovation can increase yields *and* regenerate natural capital by increasing biodiversity, enriching soils, sequestering carbon, supporting watersheds and enhancing ecosystem services.

Productivity growth in sub-Saharan Africa

Total factor productivity growth in Africa lags behind other regions – and the gap is widening







This transition centres around equipping farmers with the inputs and training to dramatically increase yields while improving their environmental footprint. This requires the mainstreaming of high-quality inputs and technologies to boost yields while reducing inputs – such as high-quality seeds and improved, more efficient and sustainable irrigation systems – coupled with training and interventions to support sustainable farming practices. New technology such as precision agriculture drastically reduces resource use. Agroforestry can increase nutrient recycling, improve soil fertility and provide additional revenue streams with little capital required. These practices help deliver on a range of priorities in the region: meeting rising food demand, supporting livelihoods, reducing environmental degradation and mitigating against and adapting to climate change. (See Exhibit 8.)

EXHIBIT 8

Key aspects of Critical Transition 1



Such a transition would result in:

- Sustainable and nutritious local production that meets growing demand.⁶² If yield growth rates of the top
 performing countries could be attained across sub-Saharan Africa, the region would be 60 per cent self-sufficient
 in grains rather than 40 per cent by 2050.⁶³ While self-sufficiency in all food groups is neither necessary nor
 desirable, the importance of grains in sub-Saharan African diets combined with the region's net agricultural trade
 deficit increases the risk of food insecurity. This transition foresees both large and small farms playing a role in
 raising yields sustainably. (See Box 3.)
- Innovations that increase the avaiability and affordability of nutritious crops. Ambitious entrepreneurs, supported by policies, will have a key role to play in delivering yield gains at-scale and supporting the roll out of regenerative practices across the region.

The non-profit Technoserve partnered with Equator Seeds to use drones in Uganda to monitor and optimise agricultural practices across 270 farms to deliver 100 per cent yield increases, 60 per cent declines in pesticide use, and greater profits for both farmers and the seed company.⁶⁴ (See 4 in Case Study Catalogue.)

- Increased agricultural diversity. Techniques such as intercropping and the cultivation of hardy indigenous crops would underpin more biodiverse and resilient farming systems. By supporting more diverse diets, a broader range of crop production would also deliver better nutritional outcomes in countries where rates of overweight and obesity are rising, for example South Africa. Already, permaculture projects in Malawi provide a year-round supply of nutritious, diverse crops that are resilient to droughts, heatwaves, floods and insect infestations.⁶⁵
- Reduced poverty, decent jobs and new revenue streams. For every 10 per cent increase in farm yields in the region, there is a 7 per cent reduction in poverty.⁶⁶ Practices that sustainably increase yields will provide incomes and jobs for a growing population. For example, agroforestry can improve existing crop yields and provide additional products for sale or consumption at home.

The Novella Project uses agroforestry in Ghana and Tanzania to generate new income streams and increase cocoa productivity. If scaled, it could generate an additional US\$2 billion a year for smallholders, half the value of west Africa's cocoa crop.⁶⁷ (See 5 in Case Study Catalogue.)

Greater resilience on the farm and beyond. Eight of the ten most vulnerable countries to climate change are in sub-Saharan Africa, according to the Notre Dame Global Adaptation Initiative Index.⁶⁸ This threatens countries' productivity and political stability, particularly those in the Sahelian region, such as Chad and Niger. This transition would see projects and practices that promote soil health, limit pollution of waterways and boost agricultural biodiversity to maintain vital ecosystem services and increase resilience.

The Upper-Tana Nairobi Water Fund in Kenya deploys contributions from public and private donors who depend on the Tana River to provide 15,000 farmers with training and resources to conserve water, protect the river's health and increase yields. A US\$10 million investment could return US\$21.5 million in economic benefits over 30 years.⁶⁹ (See 6 in Case Study Catalogue.)

Increased climate mitigation. Agriculture, forestry and land use change contribute 60 per cent of GHG
emissions in sub-Saharan Africa.⁷⁰ Under this transition, special attention would be dedicated to improving the
sustainability of the high emitting livestock sector, which generates significant emissions but also plays a critical
role in supporting livelihoods – with cattle providing dung and traction for farming and serving as a store of value
for owners, in addition to being a source of meat and dairy. (See Box 4.)

The Regional Sahel Pastoralism Support Project seeks to improve productivity and resilience of pastoral livelihoods by improving access to essential inputs, services and markets. The project aims to benefit over two million people directly.⁷¹ (See 7 in Case Study Catalogue.)

- Protection of standing forest. Ensuring that agriculture does not expand into forests is critical in countries with high forest cover, including Zambia and Mozambique. Small-scale and commercial agriculture contribute up to 54 per cent and 35 per cent of deforestation in the region today, respectively.⁷² Increased agricultural productivity, coupled with the right policies and enforcement mechanisms, pressure will ease on the forest frontier in the face of rising demand. This is particularly important in countries with rapidly growing populations and significant forest cover like DRC and the Republic of Congo.
- **Expanded use of technology, from drip irrigation to gene editing.** This would deliver significant productivity gains while reducing the need for inputs. For example, Kenyan start-up Illuminum Greenhouses builds affordable modern greenhouses and installs automated drip irrigation kits for smallholder farmers. The company also provides solar-powered sensors to monitor temperature, humidity, soil moisture and water supply.⁷³

BOX 3

Land holding size

Sustainable systems of the future can accommodate both large and small land holdings. As sub-Saharan Africa's populations urbanise, opportunities to consolidate rural land holdings may emerge. In some areas and in certain crops, larger land holdings have been found to intensify agricultural production. Large-scale commercial farmers can also work with smaller-scale farmers, encourage vertical integration and tap into economies of scale. Other studies have found that smaller land holdings can match larger ones in terms of productivity and profits, while contributing to a more genetically diverse, nutritious and resilient landscape. In any case, efforts to support smallholder farmers should not discourage those who wish to move out of agriculture and rural areas for alternative, productive jobs if available.⁷⁴

Livestock in sub-Saharan Africa

Inefficient practices mean that livestock farming contributes more emissions per unit in sub-Saharan Africa than anywhere else in the world. Nine tonnes of CO2e are emitted per tonne of milk produced in the region, over four times the emissions for the same amount of milk produced in Europe or North America.⁷⁵ With demand for meat set to increase and cattle continuing to play an important role for millions of people as a source of dung and traction for farming and a store of value for owners, increasing the efficiency of livestock farming is a critical priority.

The environmental impact of livestock farming can be significantly reduced by improving practices and reducing expansion into forests. Opportunities to reduce emissions intensity include lowering the age of beef-cattle at slaughter; breeding livestock that produce fewer emissions; improving the health and therefore deaths to disease per herd; and vaccinations or other methods to reduce enteric fermentation. Practices that increase yields include selecting bulls that produce higher meat and milk yields, as well as fewer methane emissions. Providing animals with more nutritious forage through rotational grazing increases yields and lowers enteric fermentation relative to weight gain.

Equipping farmers with the tools, training and access to finance to invest in sustainable practices could therefore simultaneously increase the supply of meat available, reduce pressures on forests and emissions from livestock production and improve farmer livelihoods.

At the same time, efforts to ensure that the increase in meat consumption in the region does not exceed the levels recommended in the planetary health diet outlined by the EAT Lancet Commission can be made.⁷⁶ In many cases, as children and women of childbearing age in the region have been found to require more red meat to fulfil their nutritional needs. Elsewhere, efforts should centre on developing affordable, accessible nutritious meat alternatives to meet mounting demand without inflicting damage on the environment.

Investing in this critical transition

Analysis conducted for this paper estimates that US\$12-14 billion will need to be invested in farms each year to 2030 to sustainably improve agricultural yields in sub-Saharan Africa.⁷⁷ This involves implementing regenerative practices, providing training for farmers, and expanding irrigation while improving its efficiency and environmental footprint. This will go some way to helping the region adapt to climate change, which other studies have estimated could cost the region US\$50 billion per year by 2050.⁷⁸ Elsewhere, studies have estimated an additional US\$4.3 billion is required in increased spending to implement land governance strategies, which is beginning to take place in countries such as Rwanda, Kenya and Zambia.⁷⁹

Barriers

Successful interventions show increased yields and improved livelihoods are achievable. Yet a series of barriers prevent these activities from scaling.

These barriers include:

Getting finance to farmers can be difficult. Many farmers lack secure land tenure – particularly women. This means they lack the collateral to secure credit to invest in land and the confidence that they will reap the rewards of investment. In addition, it can be costly to serve remote communities, where farmers often live and work. This limits the ability of farmers to invest in productivity-enhancing sustainable agriculture practices. The barriers for farmers to access finance are explored in more depth in Section 3.

Farmers often lack access to agricultural inputs and information. High-quality seeds, fertilisers and harvesting tools are often not available due to weak domestic input markets and limited extension services. Farmers in remote locations can struggle to access markets, finance and education about improved farming practices.

Physical and technological constraints. Weak infrastructure reduces the potential for – and value of – productivity enhancements. Without electricity, farmers cannot run machinery or charge phones to access information. Carefully managed irrigation could boost yields yet covers less than 4 per cent of agricultural land.⁸⁰ Low road density means input and output markets are out of reach for many, reducing both the ability and the incentive to boost yields.

Weak agricultural R&D investment limits the pace of innovation. This contrasts the central role of seed research in Asia's Green Revolution.⁸¹ Moreover, R&D investments are not always directed towards commercial ends, causing innovations to struggle to reach the market, squandering the opportunity to scale and weakening returns on investment.

Deep inequalities in value chains. These trap farmers in poverty, limiting their ability to invest in their land. Farmers are often not offered fair prices or long-term agreements for their produce, preventing them from securing a decent income and limiting their ability to plan ahead. This is discussed in more depth in Critical Transition 4.

Key actions

What can economic actors do to encourage this critical transition? They can redirect economic incentives, invest in infrastructure, empower farmers and communities, and rethink business strategies and concepts of productivity. Below, a set of concrete steps provides actors with an initial roadmap.

Infrastructural improvements and land reform are also pivotal actions. However, given their relevance across multiple critical transitions, they are addressed in Section 3.

Empower smallholder farmers and rural communities

 Agribusinesses (both multinational and domestic) and civil society can revolutionise extension services to enhance productivity and deliver on commercial objectives. Improving farmer access to high-quality inputs, including seeds, fertiliser, pest management services and agri-tech is critical to increase yields. Providing the relevant training can help to increase efficiencies and engender sustainable practices.

One Acre Fund adopts a holistic approach to extension services in six countries across the region. (See 8 in Case Study Catalogue.) Ghanaian start-up Farmerline deploys digital technology to expand the reach of extension services at minimal cost. (See 9 in Case Study Catalogue.)

- National governments can recognise and promote the value of traditional practices to leverage existing knowledge of sustainable practices that respond to local environments. For example, Yacouba Sawadogo deployed indigenous and local knowledge to regenerate degraded soils in his native Burkina Faso. The farmer created an almost 40-hectare forest on formerly barren and abandoned land, which today hosts 60 species of trees and bushes. Known as "the man who stopped the desert", Sawadogo received the Right Livelihood Award in 2018 in recognition of his work and impact.⁸²
- **Entrepreneurs can leverage technology to help farmers manage risks on their land.** Weather forecasts enable farmers to prepare for weather changes and manage their crops accordingly. For example, agricultural profiling and messaging service, Esoko, uses a digital and mobile platform to provide farmers with information on market prices, weather forecasts and crop tips in order to mitigate risk.

Catalyse innovation and embed sustainability in the food and land use sector

- Businesses can integrate sustainability into strategy to increase yields, reduce risk and tap into growing sustainable markets. Ghanaian palm oil producer Serendipalm trains farmers in organic farming and invests in services to increase productivity, reduce their environmental footprint and support livelihoods. The company negotiates a premium Fair Trade price with farmers and secures reliable access to markets as the supplier of Dr Bronner's, the USA's biggest natural soap brand.⁸³ (See 10 in Case Study Catalogue.)
- National governments and multinational companies can increase investment into commercially oriented agricultural R&D. Investment in R&D – including agricultural technology, crop varieties and seed types – could lead to the development of more productive, nutritious and resilient food systems.⁸⁴ Governments can promote demand-driven and market relevant research. Companies can invest in R&D to strengthen their portfolios and gain a competitive edge through innovation. The work of the International Potato Center (CIP) in developing biofortified orange-fleshed sweet potato – a nutritious source of Vitamin A – promises to benefit millions of households across the region.⁸⁵

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Improve access to finance

- **Commercial banks and other finance providers can create financial solutions** that link a farmer's repayment obligations to cyclical or weather-dependent agricultural performance. These include insurance and payment structure adjustments to loans (for example, payment terms linked with the crop cycle). F3 Life provides farmers in East Africa with lower interest rates for credit if they use climate smart agricultural practices that boost resilience to climate change.⁸⁶
 - **Commercial banks, insurers and other finance providers can offer innovative financial products** that incentivise a farmer to deliver on predetermined sustainability outcomes, including sustainability-linked loans and insurance policies. For example, China's largest food and agriculture company, Cofco, has just agreed a US\$2.1 billion sustainability-linked loan with a consortium of 20 banks. Targets include year-on-year improvement of ESG performance and increasing traceability of agriculture commodities, with a focus on directly sourced soy in Brazil. If the company meets the agreed targets, Cofco will invest the discounts in improving its sustainable supply, health and safety, local communities and sustainability standards.
- Entrepreneurs and businesses can equip farmers and investors with risk management tools to increase the attractiveness of agricultural investments. For example, the African Green Revolution Alliance (AGRA) and Atlas AI have created satellite-based "predictive analytics" for harvests in 11 African countries. With better access to data on crop yields, infrastructure and markets, investors can assess investment risks more effectively and farmers can adopt practices to mitigate risks.⁸⁷
- Agricultural, development and climate funds can aggregate, standardise and securitise small-scale projects into vehicles of the right size, liquidity and downside protection to mobilise largescale capital for the food and land use agenda in sub-Saharan Africa.
- Private banks and entrepreneurs can increase the use of digital technology to facilitate farmer access to finance, by creating credit profiles through mobile payment history, verify warehousing receipts to use as collateral or gather data on land use and location through GPS services on mobile phones. Technological and innovative solutions can link farmers to investors.

FarmCrowdy, Nigeria's first digital agriculture platform, connects small-scale farmers with sponsors, empowering local farmers and boosting production and food security in Nigeria.⁸⁸ (See 11 in Case Study Catalogue.)

Redirect economic incentives

- National governments can reform economically inefficient and environmentally harmful subsidies. Policymakers can redirect subsidies that benefit wealthier farmers and businesses or that promote unsustainable practices and inputs (including fertiliser subsidies that are not coupled with training on appropriate dosage, and financial support for fossil fuels) towards tools, inputs and training for poorer farmers.
- National governments can introduce economic incentives to promote sustainable livestock farming and animal-source food alternatives to reduce GHG emissions. Integrating social impact assessments and farmer consultations into such interventions is critical given the importance of livestock farming in local economies and cultures.

The Ethiopian government aims to double poultry's share of national meat consumption through US\$10 million in subsidies to support poultry feed processing plants, hatcheries and processing units, coupled with an extension programme to encourage poultry production and consumption.⁸⁹



Critical Transition 2:

Strengthen local markets for nutritious, sustainably produced food for domestic and international consumers

Providing for a growing population with rising incomes means food demand is skyrocketing. Africa's food and beverage markets could reach US\$1 trillion by 2030 if farmers and agribusinesses are equipped to unlock this opportunity.⁹⁰ Section 1 laid out the hidden costs of under-nutrition and obesity, which together exceed US\$100 billion⁹¹ and found business opportunities linked to low income food markets and enhanced value chain efficiency worth over US\$100 by 2030.⁹² By encouraging domestic markets to thrive, countries across sub-Saharan Africa can increase value chain efficiencies, meet growing food demand, shape healthier diets, improve livelihoods and drive economic growth.

This transition means building a globally significant domestic food market that meets mounting demand for food and jobs and drives economic growth. (See Exhibit 9.) To do so, countries must increase their capacity to produce and distribute consumer-ready products for a growing population by supporting value-adding activities and strengthening value chain linkages to get food from farm to fork. At the same time, they can unlock the entrepreneurial potential of an ambitious upcoming generation by addressing barriers for young people to enter the agricultural workforce. This requires equipping and incentivising those joining the labour force to enter agriculture (both on- and off-farm) and supporting those in the sector to scale their activities, access a growing market for food and boost demand for nutritious produce.

Countries in the region have already started the journey. For example, business-friendly policies and reforms have enabled Rwanda to climb to 29th out of 190 countries in the World Bank's "Doing Business" Index. Foreign investment has followed: net inflows grew from US\$10.5 million to just under US\$300 million between 2005 and 2017.⁹³ Encouraging and supporting development like this across the region is a huge opportunity for sub-Saharan African governments, businesses and citizens alike.

EXHIBIT 9

Key aspects of Critical Transition 2



An enabling business environment helps to meet mounting demand, as seen in Rwanda. Food and beverage markets are set to reach US\$1 trillion by 2050.



A greater share of down-stream activities enhances the value of produce and opens up export markets, reducing agricultural trade deficit.



Digital technology is unleashed to strengthen connections across value-chains and attract people into agriculture.





Increased intra-regional trade broadens market opportunities. Today, intra-regional trade is much lower than the global average.



A new generation of farmers and agri-entrepreneurs increases the sector's dynamism and benefits from increased job opportunities. The working age population is set to reach 1.1 billion by 2035.



A growing market for healthy products leads to improved nutritional outcomes, especially in countries with high rates of undernutrition and overweight, like Botswana and Gabon.

Such a transition across the region would result in:

A new generation of farmers and agribusiness entrepreneurs. The average farmer is 60 years old. There is
significant scope for agriculture to attract younger farmers to revitalise the sector.⁹⁴ This group would both benefit
from and generate increased job opportunities (skilled and unskilled).

Generation Africa aims to attract entrepreneurs to farming and strengthen the ecosystem that supports "agri-preneurs" to grow, leveraging a partner network to address barriers and unlock the potential of the region's ambitious young men and women. (See 12 in Case Study Catalogue.)

- A revitalised rural economy with less forced migration within and between countries and to urban areas. Migration is not a bad thing in itself: it can generate significant benefits for individuals and rural communities, not least seasonal work, the exchange of ideas and experiences, and remittances paid to rural communities by those who have left. However, ensuring that there are high-quality employment options in rural areas would reduce the numbers of people who are compelled to migrate, increase rural productivity and reduce pressure on the region's rapidly growing cities.
- A greater share of downstream activities occurring in the region. This would enhance the value of agricultural produce and lessen the dependence on imports. The value of agricultural processing relative to agricultural output is significantly lower in sub-Saharan Africa than in other developed and developing regions. This reduces the net value of agricultural output given that downstream activities like sorting, packaging, processing and retailing capture a greater share of the value chain than upstream activities like raw materials production.
- Reduced post-harvest losses. IInfrastructural improvements would reduce the amount of food that perishes along the value chain. By improving transport and cold storage facilities, more food would make it to markets, and the nutritional quality of food that makes it to consumers would not be compromised. Value-adding activities mentioned above, such as processing and packaging, would also help to curb losses by extending the longevity of produce.

ARCH Emerging Markets Partners is a private equity organisation which is currently fundraising for a US\$100m East Africa cold chain solutions fund. Through this venture, ARCH aims to help to prevent fresh produce from perishing, raising rural incomes and enhancing food security in the region while opening the possibility of global exports for storage clients. From a commercial perspective, ARCH seeks to tap into rapidly growing food demand and agribusiness activity in the region. (See 13 in Case Study Catalogue.)

Digital technology that attracts people and investment into agriculture. Digital services and platforms can provide existing and prospective farmers and entrepreneurs with access to input and output markets and finance, information on agricultural practices, weather forecasts and market prices, and linkages to investors.

Kenyan start-up iProcure is an agricultural input platform, which seeks to enhance agricultural supply chains in rural Africa. Farmers can use the platform to buy high-quality agricultural inputs, which are delivered even to remote locations. The platform provides supply-chain transparency for farmers and farm supply providers. In addition, iProcure offers farm supply providers information on how their product is being bought and used to inform strategy and customer services, based on data collected on the platform.

A carefully managed emergence of supermarkets and innovative e-commerce retailers. This offers an opportunity to enhance value-adding opportunities, streamline supply chains, broaden the supply of products – particularly in urban areas – and lower consumer prices (See Box 5.).

Supermarkets and E-commerce

Supermarkets account for only a small share of food retail sales in sub-Saharan Africa today – just 16 per cent in Kenya and 9 per cent in Zambia – but they are growing. Key retailers already in the region include South African retailers Shoprite and Massmart, along with French chains Carrefour and Auchan. If combined with appropriate regulation, supermarkets could benefit producers and consumers by providing farmers with stable and growing demand, training and higher-value opportunities, increasing efficiencies in markets and delivering choice and competitive prices to consumers.⁹⁵ The development of domestic supermarket chains represents a significant growth opportunity for entrepreneurs in the region, too.

The rise of the supermarket in sub-Saharan Africa must be carefully managed. The procurement systems of large chains pose threats to small producers and SMEs, which must be managed to create a fair playing field and to avoid already vulnerable food vendors from suffering. Meanwhile, local and informal markets will remain a significant part of food systems, particularly in remote and rural areas. E-commerce platforms also open opportunities to enhance supply chains in the region. For example, agri-tech start-up Twiga Foods supplies fresh fruit and vegetables from Kenyan smallholder farmers to small- and medium-sized vendors, outlets and kiosks in the capital, Nairobi. (See 14 in Case Study Catalogue.) Farmers deliver their produce to Twiga Foods collection centres, receiving payment via mobile money within 24 hours. Having launched in 2014, the platform serves over 8,000 farmers and over 5,000 vendors.

The mobile-based cashless platform enables Twiga Foods to offer higher prices and a guaranteed market for farmers, along with lower prices and a reliable supply to vendors. By matching demand to supply, the platform reduces post-harvest losses and waste. Consumers also benefit from accessing fresher products at lower prices thanks to a more efficient supply chain.⁹⁶

The emphasis that e-commerce platforms place on logistics represents a significant opportunity to enhance farmer connectivity and value chain efficiency as companies like Twiga Foods expand across the region.

- A growing market for healthy products, supported by government-led food health regulations. Population growth, urbanisation and a growing middle class means the market for affordable ranges of nutritious staple foods is growing. Food entrepreneurs see opportunity in developing and marketing healthy, affordable products particularly in countries looking to manage a "double burden" of undernutrition and overweight, including Zimbabwe, Cameroon and the wealthier Seychelles.
- **Reduced "food fraud"**, levels of which are high among imports to the region. An estimated 50 per cent of all imported goods to Tanzania, including food, drugs and construction materials, are fake.⁹⁷ Food systems that can displace these imports and identify food safety issues when they arise would help to reduce health risks linked to food.

Nigerian company AACE Foods processes, packages and distributes nutritious food to meet growing middle-class demand, improve nutrition and farmer livelihoods, displace imports and increase export values.⁹⁸ The company seeks to reverse dietary shifts towards unhealthy (often imported) foods. (See 15 in Case Study Catalogue.)

New export opportunities. A resurgence in indigenous foods would not only reduce demand for imported, often unhealthy foods, but also create opportunities to develop food brands for consumption within the region and for export.

Yolélé Foods seeks to create an export market for fonio – the super-nutritious indigenous grain of the Sahel – by bringing it to both Western and West African markets. This would help to generate jobs and boost growth in the Sahel region.⁹⁹ (See 16 in Case Study Catalogue.)

- Increased formal intra-regional trade. Despite significant growth since the 1990s, intra-African trade is lower than the world average. Intra-regional trade makes up for just 23 per cent of countries in the region's food imports and 26 per cent of food exports in contrast to 35 per cent and 57 per cent respectively in developing Asian economies.¹⁰⁰ By strengthening value chain connections and markets for domestic produce, countries would remove the barriers for intra-regional trade. This would open up opportunities to buy and sell produce, boost business growth, and reduce the region's agricultural trade deficit. Building on the Continental Free Trade Area (CFTA), signed by 54 nations in 2018, represents an unprecedented opportunity to smooth trade and stimulate growth.
- **Economies of scale reached.** Larger trading opportunities would warrant aggregation centres, generating investment opportunities and enhancing the price competitiveness of the region's produce.

Investing in this critical transition

Analysis conducted for this paper estimates that an annual investment of US\$22-24 billion is needed to increase value-chain efficiency, improve nutrition and support a new generation of entrepreneurs in sub-Saharan Africa.¹⁰¹ US\$17 billion of this investment is required to reduce post-harvest losses and supply-chain waste. An additional US\$4 billion would help to deliver on nutrition targets and support school food programmes. The rest would be directed at providing training for food entrepreneurs in the region. These costs are conservative. First, they do not include wider investments in infrastructure, connectivity, access to finance and education, which are addressed in Section 3. Second, they do not cover the additional spending required to deepen domestic markets, from expanding local processing facilities (estimated in other studies to require an additional US\$7.7 billion each year) to improving rural and wholesale market facilities (requiring an additional annual US\$6 billion investment).¹⁰²

Barriers

Local success stories show that building and benefiting from domestic markets is a big win. Yet a series of barriers prevent these activities from scaling. These are:

Political risk, uncertainty and corruption create a weak enabling environment. These hamper the ability for business to launch and operate in the region and increase risks for private investors. Onerous bureaucracy, inconsistently applied regulations, unpredictable policies, a lack of secure land tenure and corruption can collectively create a difficult environment for new businesses and potential investors.

Weak infrastructure limits opportunities for farmers to tap into growing demand. Unreliable access to roads, electricity and other infrastructural assets increases inefficiencies in the value chain and limits the scope to support value-adding activities and engage in intra-regional trade. Weak urban-rural linkages represent a particular opportunity missed: farmers lose out as they cannot access urban markets to buy inputs or sell their produce, nor can they benefit from aggregation points and processing facilities that urban centres could support.

Weak infrastructure increases import dependence and the cost of trade unnecessarily. Without a means to efficiently get domestic produce into urban centres, city dwellers are compelled to buy imports. At a regional level, infrastructural weaknesses increase the costs of trade, including intra-regional trade: sub-Saharan Africa's agricultural trade costs are estimated as more than 50 per cent higher than those in East Asia and the Pacific, Latin America and the Caribbean.¹⁰³

Inconsistent procurement channels. These increase the risk of crops perishing by extending the time between the harvest of raw produce and its sale to buyers. Without guaranteed off-takers or buyers, smallholder farmers cannot time harvests to occur immediately before a sale, resulting in losses. This degrades the nutritional content of crops and takes up land which could otherwise be dedicated to a second crop.

Farmers, young people and entrepreneurs have limited access to land, finance and business training. Rapid population growth has increased demand for land, causing average farm sizes to decline in countries across the region. In response, many rural dwellers are compelled to seek work outside farms. Weak access to finance and business training also limits farmers' and entrepreneurs' opportunities to scale their activities and ideas and move to more commercial modes of farming.

Rising food imports are creating complex challenges for local producers. An influx of convenience foods from abroad is undermining demand for domestic produce. International companies are increasingly looking to sub-Saharan Africa as a valuable growth market. This tilts demand towards food imports, given the region's historical processing limitations.

Key actions

What can economic actors do to encourage this critical transition? They can boost local capacity for markets through business-friendly policies and regulations, investing in human capital, shaping demand and supporting farmers and entrepreneurs to thrive. Market forces can be used and amplified to incentivise the production of nutritious, sustainable, domestic produce. Key steps for a range of actors are outlined below.

Infrastructural improvements and land reform are key to unlock this critical transition. Their importance across multiple transitions means that they are addressed in Section 3.

Create an enabling environment for new and bigger domestic markets

- Governments can introduce policies that promote stability, standardise regulation and governance and inject dynamism into markets to create the enabling conditions for increased private enterprise in the agri-food sector. Economic, political and regulatory stability are critical to improve ease of doing business for both domestic entrepreneurs and international investors.
- **National governments can introduce food quality and safety regulations and mandate transparency** to protect consumer health, compete against imported foods and tap into export markets. Introducing regulations around food labelling and food standards, along with greater transparency of domestic value chains can help to identify food safety issues and increase consumer trust in domestic produce.

National governments, businesses and development partners can build human capacity to equip the next generation to develop and scale business ideas. Investments should target: improvements in access to high-quality primary, secondary and tertiary education and business schools, with an emphasis on agribusiness; vocational programmes that emphasise agribusiness training; platforms for farmers and other food entrepreneurs to share knowledge; and training in agribusiness for policy-makers to better understand the landscape of opportunities and trade-offs.

Harness market forces to incentivise the production of nutritious, sustainable, domestic produce

- National governments can align policy and fiscal incentives around healthy foods to increase the availability of nutritious products and ranges. This could include support for start-ups that promote nutritious product ranges, subsidies on healthy foods, and taxes and marketing restrictions for unhealthy foods. For example, South Africa's sugary drinks tax of early 2018 generated R800 million (US\$57.5 million) within five months of its introduction. A portion of these revenues will be channelled into healthcare.
- **Domestic and multinational agribusinesses can commit to local sourcing** to increase demand for domestic produce and boost investment opportunities in local value chains.

Heineken has begun to integrate smallholder cassava farmers into its value chain in Nigeria, with a guarantee to purchase from a local factory buying from smallholder farmers.¹⁰⁴ (See 17 in Case Study Catalogue.)

• National governments and food companies can internalise the costs to health and the environment of food production to enable sustainable nutritious food to compete on price in sub-Saharan Africa. This is critical given the high price-sensitivity of consumers in the region.

Provide direct support to young people and entrepreneurs

- Farmers and entrepreneurs can work together to build capacity and establish leverage as a powerful generation of food system leaders. Cooperatives and networks offer the opportunity to aggregate produce, link up to distribution platforms, access training and share knowledge.
- Governments and private companies can partner to establish incubation hubs to support small and medium enterprises (SMEs). Hubs can support entrepreneurs by matching them with potential investors, offering business management training, providing market information and establishing a network to share knowledge and examples of best practice. Digital technology offers opportunities for hubs to be hosted online. Yet physical hubs can also offer users access to productivity-enhancing tools and infrastructure, from electricity to irrigation. For example, the Babator Irrigation Hub in northern Ghana provides irrigation facilities for both commercial tenants and smallholder farmers.¹⁰⁵
 - **Governments, development finance institutions and private investors can partner to increase investment in farmers and SMEs.** Partners can develop blended finance vehicles targeted at providing affordable capital to young people and entrepreneurs or capitalise intermediaries such as microfinance institutions. Aggregating projects into a fund or working through intermediaries facilitates private investor participation as they can justify the transaction costs for a larger deal size. Funding can also be targeted at female-led SMEs to address gender imbalances in access to finance. Actions to increase access to finance are explored in more detail in Section 3.

The Farm to Market Alliance brings together partners from across sectors to revolutionise extension services and provide support to farmers and SMEs.¹⁰⁶ (See 18 in Case Study Catalogue.)

 International donors can invest in technical assistance for SMEs to equip them to scale and attract commercial investment. Venture capital initiatives like AgDevCo can maximise their impact by providing technical assistance to entrepreneurs alongside grants and loans. Initiatives like the Fund for Agricultural Finance in Nigeria (FAFIN) can be replicated and scaled.

Shape demand for sustainable, nutritious produce

- National governments can introduce and enforce mandatory micronutrient fortification to raise the nutritional quality of staple foods.
- National governments can set dietary guidelines and invest in nutrition educational programmes in schools and the marketing of affordable, healthy foods for the poor to equip people to make healthier and more environmentally sustainable choices.
- Food brands and retailers can redesign product and marketing campaigns to influence and respond to
 consumer demand for healthy, indigenous produce. For example, the Global Alliance for Improved Nutrition
 (GAIN) supports SMEs to develop nutritious food ranges in Kenya, Mozambique and Tanzania through its
 Marketplace for Nutritious Foods programme.¹⁰⁷ (See 19 in Case Study Catalogue.)

Social enterprise Africa Improved Foods (AIF) develops locally produced, nutritious food in Rwanda to address stunting and malnutrition, generate job opportunities and enhance the value of the country's exports. The vertically-integrated company sources and transports maize and soybean from farmers to its factory, where it processes the grains into fortified porridge products, for distribution via mainstream markets and contracts with development and government partners. (See 20 in Case Study Catalogue)

 Civil society organisations and communities can advocate for food systems that support sustainable production and prioritise nutritious produce to place pressure on governments and accelerate action. Platforms for community engagement can create a space to share ideas across social groups and sectors.

Sustainable Diets for All is an advocacy programme led by Hivos and the International Institute for Environment and Development (IIED), which supports civil society organisations and low-income communities to advocate for better food production, trade and consumption. (See 21 in Case Study Catalogue.)

Increase intra-regional trade

National governments can remove intra-regional trade barriers to grow domestic market opportunities and improve aggregate food security. Governments can remove tariffs and non-tariff barriers such as addressing infrastructural weaknesses, removing import and export bans, and reforming restrictive rules about the origin of goods. In addition, governments can reduce interference in commodity prices that can result in higher price volatility in sub-Saharan Africa than in other regions.¹⁰⁸



Critical Transition 3:

Work at the landscape level to preserve and grow natural capital

Sub-Saharan Africa is more dependent on its natural capital than almost anywhere else in the world. This critical transition would help to reduce hidden costs linked to greenhouse gas emissions and natural capital degradation, which exceed US\$400 billion¹⁰⁹, while unlocking US\$120 billion in business opportunities linked to forest ecosystem services and restoring degraded land, as shown in Section 1. A recent study of global restoration opportunities in tropical rainforests found that the six countries with both the highest feasibility for restoration and the greatest potential benefits for the environment, the economy and human well-being were all in Africa: Rwanda, Uganda, Burundi, Togo, South Sudan and Madagascar.¹¹⁰ Natural capital accounts for over a third of total wealth.¹¹¹ Over 70 per cent of people in the region depend on forests and woodlands for their livelihoods.¹¹²

A transition to landscape-level management of natural capital means conserving and restoring natural ecosystems and the services they provide beyond the farm, through collective efforts with the organisations and communities that depend on them. Such a transition makes it is possible to deal with potential regional and global trade-offs, for example, balancing the need for climate mitigation and forest protection against the benefits of local agricultural production. (See Exhibit 10.) To do so requires policies, strategies and practices that halt deforestation and natural capital degradation, restore degraded land and coastal areas, and improve livelihoods. A careful transition will be particularly paramount in countries with high forest cover – including DRC, Angola and Zambia – and with rapid population growth, such as densely populated Rwanda and Burundi, where pressures on natural resources will be intense.

EXHIBIT 10

Key aspects of Critical Transition 3



Such a transition across the region would result in:

- An enhanced ability to mitigate climate change. Modelling for this report finds that stopping deforestation and broader natural capital losses could reduce sub-Saharan Africa's forecast annual emissions in 2050 by 2000 MtCO2e versus current forecasts and generate revenues through international carbon markets, particularly in countries with large areas of remaining forest.¹¹³
- Reduce GHG emissions though degraded land restoration. Over two-thirds of productive land in sub-Saharan Africa are degraded,¹¹⁴ compromising carbon sequestration capacity and undermining the livelihoods of at least 450 million people.¹¹⁵ A concerted afforestation programme between now and 2050 could sequester over 450 MtCO2e per year by 2050.¹¹⁶

The African Forest Landscape Restoration Initiative (AFR100) is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. To date, 27 countries have committed 111 million hectares to restoration. More than US\$1 billion in development finance and US\$545 million in private investment has been pledged to support these efforts.¹¹⁷ (See 22 in Case Study Catalogue.)

Proper valuing of natural capital with payments for ecosystem services. Forests are a critical economic asset, contributing 6 per cent of the region's GDP.¹¹⁸ Their protection is a particularly compelling opportunity in densely forested countries like Gabon, the Republic of Congo and Guinea-Bissau. Increasing access to carbon and offset markets represent one way to increase forest protection. New business models that create value around land restoration and forestry is another.

The Smallholder Forestry Vehicle seeks to enable private investment in smallholder forestry in Africa to restore 15,000 hectares of degraded land. This would provide 50,000 farming households with US\$1,500 in savings each year due to increased climate resilience.¹¹⁹ (See 23 in Case Study Catalogue.)

Private equity firm Criterion Africa Partners (CAP) invests in the sustainable forestry industry in sub-Saharan Africa. Through two funds that together have US\$242 million assets under management, CAP invests across the value chain to improve forest health and bring about positive social development while generating returns.

Villages along Kenya's southern coastline have earned money from carbon markets by sustainably managing and restoring mangrove forests. In addition, the long-term availability of mangrove wood has been secured and ecotourism is flourishing.¹²⁰ (See 24 in Case Study Catalogue.)

Finally, protecting and regenerating natural capital is a key opportunity to strengthen the region's resilience to climate change in the face of mounting impacts. Functioning ecosystems can help to regulate climate and water cycles and reduce risks of flooding, drought and soil erosion, which are forecast to increase with climate change. Climate-targeted investments are critical to mitigate risks of famine, conflict and unmanaged migration, as has been experienced recently in Somalia and Eritrea. Halting deforestation and promoting reforestation can play a critical role in restoring land, strengthening resilience and improving livelihoods.

The Great Green Wall Initiative aims to restore 100 million hectares of degraded land in the Sahel region. The project aims to generate 10 million jobs in rural areas, provide food security for 20 million people, increase resilience to climate change and sequester 250 million tonnes of carbon by 2030.¹²¹ In so doing, it would dramatically increase stability and reduce forecast migration levels. (See 25 in Case Study Catalogue.)

Investing in this critical transition

The investment required to protect and regenerate sub-Saharan Africa's natural capital is estimated at US\$9-13 billion each year by 2030. The vast majority of this investment would support the restoration of the region's forests, including peatlands. Additional investment would support the conservation of standing forests and mangroves. These investments would help to secure protected areas for wildlife to thrive in the region and provide vital ecological and economic benefits to neighbouring communities, which other studies have estimated could cost US\$1.2-2.4 billion each year.¹²²

Barriers

Despite the size of the prize, the following barriers mean that natural capital continues to be depleted at an alarming rate in sub-Saharan Africa.

Rapid shifts in demand. Population growth is increasing pressure on resources as demand for food, fuel and land increases. Unmanaged urbanisation complicates challenges for land- and water-use planners to balance demands on resources and provide essential infrastructure and services for populations on the move.

Dependence on wood fuel for energy is a key driver of deforestation and land degradation. In the absence of alternative energy sources, 90 per cent of the population relies on firewood and charcoal as a primary source of domestic energy supply in sub-Saharan Africa.¹²³ Population growth and urbanisation are causing energy demand to rise, increasing pressure on forests as a source of wood fuel. Every 1 per cent rise in urbanisation can increase charcoal consumption by 14 per cent.¹²⁴

Demand for offsets in growing global carbon markets remains low. Despite the growth in global carbon markets, demand for Certified Emission Reduction credits (CERs, credits for global carbon mitigation outcomes) is low. Of the 57 carbon pricing initiatives implemented and scheduled for implementation, only six have provisions to enable the possible use of international credits which could begin to flow payments to emissions-reducing projects across sub-Saharan Africa.¹²⁵ Adding to this uncertainty, at the recent COP24 in Poland no decision could be reached on the future of the agreements around the issuing of global mitigation outcome credits, further delaying possible demand increases.¹²⁶ This means that large-scale payment mechanisms for the carbon storage potential in sub-Saharan Africa's forests and soils are still some time away.

Institutional constraints weaken the capacity to sustainably manage demands on natural resources. Many countries lack the institutional arrangements to support integrated land- and water-use planning. This means that resources are not effectively managed to avoid conflicts and deliver maximum gains for agricultural productivity, environment, nutrition and livelihoods. A lack of comprehensive, reliable and up-to-date data also undermines many countries' ability to develop evidence-based land- and water-use plans. For example, 57 per cent of tropical African countries had "limited" or "low" capacity to monitor forest area change in 2010.¹²⁷

Unsustainable trade agreements place additional demands on land management systems. Land deals that cover 56 million hectares of land in sub-Saharan Africa (three times the area covered by land deals in Asia) must be managed carefully to ensure that increased demands on land do not drive natural capital degeneration.¹²⁸

Weak capacity at local levels means that decisions are not reliably translated into action. Weak inter-departmental coordination, limited training, tight budgets and a failure to involve communities in decision-making at local government levels can compromise the implementation of land- and water-use plans and other interventions. In addition, weak governance and outdated regulation means that natural capital is not effectively protected. Only 14 per cent of terrestrial land is under protection in DRC, despite globally significant forests covering just under 70 per cent of the country.¹²⁹ Even within protected areas, weak governance and partial implementation of law and policy means that large parts are still destroyed. Seven of Cote d'Ivoire's 23 protected areas have been entirely converted to cocca production.¹³⁰ Meanwhile, illicit trading in natural resources costs the African continent an estimated US\$120 billion per year, 7 per cent of GDP.¹³¹

Key actions

What can economic actors do to encourage this critical transition? Key actions to address hurdles and scale sustainable land management require high-level direction through evidence-based planning and corporate commitments, coupled with on-the-ground engagement through local governments and community leaders.

Institutionalise land- and water-use planning

- National governments can institutionalise holistic evidence-based land- and water-use planning to balance demands on land and natural resources from within sub-Saharan Africa and abroad, promote agricultural productivity increases and strengthen resilience. Prioritising crops according to their nutritional quality, yield potential, climate resilience and relevance for local communities will help to meet mounting food demand in the face of climate change's impact on agricultural productivity. Identifying areas with high conservation value will enable countries to maximise the impact of protected and conservation areas. Governments can use the Framework and Guidelines for Land Governance in Africa and Guidelines for Large-scale Land-based Investments to inform planning.
- National governments can collaborate to conduct cross-national land- and water-use planning where necessary to manage shared resources. For example, the governments of Senegal, Mauritania and Mali have established a set of planning institutions and agreements to fairly distribute the benefits of the Senegal River to all.¹³² (See 26 in Case Study Catalogue.)
- National governments can integrate trade agreements into land- and water-use planning to maximise the benefits of rising foreign investment and ensure it does not compromise the region's landscapes and long-term stability.
- National governments, businesses, civil society and research institutions can work together to improve data availability to support evidence-based land- and water-use planning. Data improvements are critical to ensure that plans respond to conditions on-the-ground, maximising their impact and securing their long-term sustainability.

Extend and enforce protected areas

- National governments can extend protected areas across all primary forest and other precious ecosystems
 to prevent further irreversible losses. At a bare minimum, sub-Saharan African governments and partners can
 commit to meeting the targets laid out in the Aichi Biodiversity Targets to protect at least 17 per cent of terrestrial
 and inland water, and 10 per cent of coastal and marine areas.¹³³ Looking forward, governments can commit to
 the more ambitious targets of the Global Biodiversity Framework to conserve 30 per cent of all terrestrial and
 inland waters and 30 per cent of oceans by 2030.¹³⁴
- National governments can ban unsustainable practices like primary forest deforestation and illegal mining practices to disincentivise companies and individuals from expanding into forests.
- International institutions and multinational businesses can commit to increased investment for natural capital
 protection and restoration. Increased investment could support management and surveillance systems that
 leverage technology alongside police and law enforcers. For example, the Ethiopian government has committed
 to restore 22 million hectares of forest, one-sixth of the country.¹³⁵ (See 27 in Case Study Catalogue.)

 Companies, governments and entrepreneurs can increase investment in R&D and early phase project development to accelerate new and profitable technological solutions that enable restoration, from cocoon technology that supports tree plantation to BioCarbon Engineering's use of drone technology to plant trees in remote areas. (See 28 in Case Study Catalogue.)

Strengthen capacity and on-the-ground accountability

- National governments can build capacity at local and regional levels to translate sustainable landscape management into action. This includes developing mechanisms to boost collaboration across departments, enlarging budgets and increasing local government authority to enforce rules, make investments and manage conservation and restoration programmes.
- National and local governments can involve rural communities in land- and water-use planning to ensure that policies and strategies address on-the-ground realities and secure local buy-in.
- Companies and civil society can deploy technology to increase transparency in international and local supply chains to identify and address illegal and unsustainable practices and monitor progress. This would also help to build trust with consumers and reduce value chain risk.
- National governments can introduce regulations around the sustainable use and maintenance of infrastructure to improve the economic efficiency and environmental effectiveness of interventions like irrigation and prevent resource depletion and degradation.

Partner and innovate to increase investment in sustainable landscapes

- Governments inside and outside sub-Saharan Africa can develop payments for ecosystem services schemes to price natural capital protection and management and create mechanisms for beneficiaries to pay. Models include payments for ecosystem services, conservation finance models like carbon and resilience credits, debt for nature swaps and tourism user fees.
- Project developers and country governments can look to developments in global voluntary and mandatory carbon markets as a way to increase investment into carbon mitigation projects. Although there remains significant uncertainty about the international offset market, promising examples are on the horizon for example, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which is an emission mitigation approach for the global airline industry, developed by the International Civil Aviation Organization (ICAO). CORSIA is expected to create demand for around 3 GtCO2 between 2020 and 2035, suggesting the aviation sector could become the largest source of demand for international emissions reduction credits over the coming decade.¹³⁶
- Development finance institutions can increase the proportion of climate mitigation finance that flows to sub-Saharan African food and land use systems to leverage the region's forests as a means to sequester carbon. Today, less than 2 per cent of global climate mitigation finance – around US\$300 million annually – goes to food and land use systems in sub-Saharan Africa.¹³⁷ Increasing this share represents a huge opportunity to protect and regenerate natural capital in the region.
- Development finance institutions can increase the proportion of climate adaptation finance that flows to sub-Saharan African food and land use systems, rrecognising the importance of thriving ecosystems and infrastructure to the region's stability and resilience. Just over a quarter of global climate adaptation finance flows to sub-Saharan Africa each year, of which US\$1.7 billion goes to food and land use systems. This is despite the forecast that countries in the region will be among the hardest hit by climate change in the world.¹³⁸

- Public and private sector actors can partner to develop innovative, sustainable business models to embed conservation and regeneration of natural capital into the food and land use sector. For example, GIZ and Technoserve are working to develop value chains for high-value forest coffee in Ethiopia that equip and incentivise farmers to conserve forests. On the production side, GIZ works with cooperative unions to train farmers on harvesting practices and build centralised drying stations and drying beds. On the consumption side, the partnership is developing internationally recognised Ethiopian coffee brands to catalyse demand.¹³⁹
- Investors can participate in conservation and regeneration efforts through vehicles such as development and impact funds that aggregate small-scale projects. For example, the Africa Tree Fund incentivises forestry organisations and farmers to plant millions of commercial-use trees by providing affordable finance. Portfolio modelling suggests a gross fund IRR to investors of 5 per cent after losses. (See 29 in Case Study Catalogue.)



Critical Transition 4:

Capture gains from equal rights

Addressing the inequality of the food and land use sector is one of the highest potential strategies to improve livelihoods, increase agricultural productivity and maximise benefits from international trade. High rates of inequality deny many of decent livelihoods in the region. As shown in Section 1, there is opportunity in reducing the US\$80 billion in annual hidden costs linked to rural poverty. Of those living in multidimensional poverty (deprived of health, education and standard of living), 86 per cent are rural dwellers, the majority of whom derive their livelihoods from agriculture.¹⁴⁰ Cocoa farmers in Cote d'Ivoire and Ghana earn between US\$0.50 and US\$0.84 per day¹⁴¹ despite cumulatively producing 60 per cent of cocoa for the US\$50 billion/year chocolate industry.¹⁴² (See Exhibit 11.)



Share in the value chain of chocolate production

Source: Cocoa Barometer. (2015) Cocoa Barometer 2015. Available online at: http://www.cocoabarometer.org/Cocoa_Barometer/Download_files/Cocoa%20Barometer%202015%20.pdf

A transition to equal and inclusive food and land use systems will take efforts on multiple fronts to address today's inequalities. Such a transition would see farmers capture an increased share of the value generated by their produce, reaping the benefits of increased agricultural production and stronger markets emerging in countries like Ghana. It would ensure that women have equal access to resources including property, finance and education to realise their full productive potential and support nutritional and health outcomes. This transition also tackles inequality between sub-Saharan African food and land use actors and their partners abroad, increasing the benefits of engaging in international markets. (See Exhibit 12.)

EXHIBIT 12

Key aspects of Critical Transition 4



Such a transition across the region would result in:

- Increased resilience to climate shocks and market shifts at the farmer level. Today, farmers bear disproportionate risks relative to others in the value chain as their incomes are completely dependent on their crops. This is particularly true in the Central African Republic where the economic importance of food and land use is high. Crops can be destroyed by one flood or drought or rendered worthless should prices fall. This transition would see increased use of financial and contract models that help farmers to manage their risk: affordable insurance and long-term contracts that guarantee a degree of price stability. Supporting farmers to diversify their incomes in other crops or activities can also help them to mitigate risks.
- **Higher incomes and additional jobs.** Under a transition to equal and inclusive systems, farmers would obtain opportunities to engage in agricultural activities off-farm.

Vanilla supplier Symrise's recent establishment of a vanilla extraction facility in the poor Sava region in Madagascar has generated 200 factory jobs and improved livelihoods in the local economy. As the vanilla supplier to international agribusiness Unilever, the company represents a critical link between farmers and massive demand. The region also benefits from Unilever's engagement in broader efforts to support farming communities.¹⁴³ (See 30 in Case Study Catalogue.)

Technological innovations that empower farmers. Digital technology would equip farmers with market information to ensure that they secure fair prices for produce, connections to traders, potential investors and other farmers to improve market access and broaden opportunities to scale their activities.

Annona uses blockchain technology to connect farmers to importers and exporters, accompanied by full transparency on pricing and profit-and-loss reporting via SMS. Food companies can use the platform to integrate and coordinate farmers, audit costs, track sourcing and quality metrics and manage payments.¹⁴⁴

Increased formal participation of women in the food and land use economy resulting in higher agricultural productivity, nutritional outcomes and levels of economic growth. If women had equal access to resources and could contribute fully to the sector, the positive impact on productivity rates would reduce the number of undernourished people in sub-Saharan Africa by 100-150 million.¹⁴⁵ These improvements are all the more impactful given women's role in organising and preparing food at home. A transition towards more equal gender rights would see improved access to resources, land and the profits of their labour and the handling of household income.

Ghanaian social enterprise, Naasakle sources and processes shea nuts from more than 5,000 women pickers, paying them up to 25 per cent more than the price paid by middlemen and traders.¹⁴⁶ (See 31 in Case Study Catalogue.)

- Women accessing high-quality education and engaging in agricultural and business management training. This
 would enable them to benefit from digital innovations that offer information on crops, weather forecasts, market
 prices and more. Today, over half of women over fifteen are not literate, compared to 30 per cent of men.¹⁴⁷
 Investing in women's education and development would equip them to become productive entrepreneurs and
 leaders in the sector.
- Strengthened trade regulation. This would help to balance import and export expenditure, while enhancing food safety and nutritional levels. Ensuring that trade terms of agreement do not disproportionately favour partners outside the region is critical. Strengthening regulation, increasing price transparency and improving information on the nutritional value of food products would enable governments and consumers to make better-informed choices around the products they import, including on price.

Increased support for sub-Saharan African negotiators in trade agreements. This would ensure that international trade delivers equal benefits to countries in the region as to partners abroad. Improved access to information, negotiating training and stronger regulation can equip negotiators in the region to secure fair terms of trade, particularly around patents for indigenous produce.

Such an effort might have prevented Ethiopian negotiators from agreeing to grant a European patent for tef – one of the country's key staple crops – to a Dutch firm, which limits the country's ability to benefit from the crop's mounting popularity abroad.¹⁴⁸ (See 32 in Case Study Catalogue.)

Barriers

Addressing inequality in sub-Saharan Africa represents a huge opportunity. However, the following barriers stand in the way:

- Market failures mean that farmers shoulder a disproportionate burden of risk with the lowest returns, trapping them in poverty and limiting their ability to grow. These include a lack of long-term contracts, standardised prices and access to information on market conditions. This inhibits their negotiating power and prevents them from accessing a stable and prosperous income.
- Weak governance and a lack of transparency reduce accountability in value chains. Many countries in sub-Saharan Africa lack clear regulations around working conditions or the ability to apply them impartially. This means that abuses continue, including high rates of poverty, gender inequality, child labour and slavery. Despite commitments to transparency and traceability, international commodity value chains remain largely impenetrable.
- Social norms entrench inequality. Even when legal or other rights are secured, religious and cultural norms around women's rights and roles can prevent these from being effectively implemented. Many women can only secure access to land through their husband and social norms often dictate that they cannot handle the money they earn, reducing their ability to benefit from their labour and manage their earnings. Moreover, by challenging traditional attitudes, programmes and policies designed to empower women for example, granting land titles can inadvertently put them at risk to retaliatory violence.
- Under-representation of minority groups including women, youth, indigenous groups and low-income communities in formal positions – reduces opportunities for them to share their perspectives and empower each other. Under-financed extension services are limited in scope and often do not integrate minority groups' rights. More broadly, far fewer members of disadvantaged groups occupy prominent positions in food and land use systems, from policy-makers and agribusiness leaders to farmer networks and community leaders.
- Weak trade regulation, transparency and training increase the vulnerability of sub-Saharan African countries to exploitative trade agreements and unsustainable foreign investments. This is a particular challenge for smaller-scale operatives in the region who lack trading experience and negotiating power. Contracts between these producers and traders can disproportionately benefit foreign investors.



Key actions

What can economic actors do to encourage this critical transition? They must address market failures and social norms that embed inequality in value chains and broader society. This requires efforts to increase transparency and engage with local communities. A set of key actions are outlined below.

Land reform and promoting women's sexual and reproductive health are critical actions. Given their relevance across multiple critical transitions, they are addressed in Section 3.

Address market failures and structural issues in commodity value chains

- National governments can introduce regulations that curtail agribusinesses' power relative to farmers to create a level playing field and promote the redistribution of wealth along the value chain towards farmers. This includes tackling monopolist behaviour, mandating a degree of company responsibility for farmer livelihoods and increasing transparency around wealth distribution.
- Businesses can advocate for government regulation on fair value chains to create a "race to the top", rewarding companies that address inequalities in their operations and applying pressure on those with room for improvement.
- **Civil society and farmers can establish farmer networks and cooperatives** to strengthen their negotiating power, unlock economies of scale and share market information (e.g. on price). Farmer cooperatives help to improve farmer access to inputs, drive efficiencies in costs through improved access to storage, aggregation and processing facilities and strengthen connections to markets. These networks can also offer training on agronomic best practices, post-harvest handling and standards, financing and business management. By building their own support network, farmers can strengthen their negotiating position relative to other actors in the value chain.

The Kenya Tea Development Agency (KTDA) supports 550,000 small tea farmer shareholders to access inputs, agri-extension and other services including packaging, distribution, marketing and financing to improve incomes and increase leverage in the value chain.¹⁴⁹ (See 33 in Case Study Catalogue.)

Commit to fair, stable prices and improved payment terms for workers in the value chain

 Businesses can commit to fair, transparent and long-term contracts with farmers and other workers in the value chain and offer a living wage. Companies need to show leadership to address inequalities in their value chains, whether individually or through agreed (and independently monitored) collective bargaining processes. In every commodity – from shrimps to coffee to dairy – and most geographies, there are businesses that have committed to fair and long-term contracts with farmers.

Fruit company Blue Skies works directly with farmers across four countries in sub-Saharan Africa to provide them with living wages. The company employs over 4,000 people and has annual revenues of US\$130 million.¹⁵⁰ (See 34 in Case Study Catalogue.)

In Malawi, the Global Living Wage Coalition works with over 35 supply chain organisations to secure a living wage for tea supply chain workers as part of the Malawi Tea 2020 Programme. The programme has secured commitments from eleven tea buying companies and retailers, including Marks and Spencer, Tesco and Unilever, to achieve a Malawi tea industry where workers earn a living wage and smallholders earn a living income.¹⁵¹ (See 35 in Case Study Catalogue.)

Increase transparency and accountability to ensure that inequality is detected and addressed

- Civil society can leverage technology to increase transparency and expose abuses in value chains, to increase
 the pressure on businesses to improve working conditions and terms of employment for all. This includes unfair
 distribution of wealth, disproportionate handling of risk, slavery, child labour and other abuses of power. This will
 help companies to improve and reward those who commit to better standards.
- Private companies and civil society can partner to increase visibility over farmer livelihoods to ensure they have
 access to fair prices. Agribusinesses can introduce mechanisms to engage directly with farmers to ensure they
 receive fair and stable prices for their produce. They can also leverage technology to share price information and
 tracking systems with farmers, for example through Warehouse Receipt Systems.

Recognise and promote women's rights and access to property, finance, education and employment

- National and local governments can introduce and implement laws and policies that recognise women's
 property rights to unlock their potential as productive actors in food and land use systems. With secure property
 rights, women would have greater financial access and security, enabling them to take risks, invest in land and
 plan for the future.
- Civil society and community leaders can partner to promote women's rights and engage communities to support these through social and religious norms that embed equality into society and increase the effectiveness of top-down policies, laws and strategies.
- Farmers can push for platforms and establish networks that support women's rights to increase productivity and enhance resilience.
- Investors can seek out and support female entrepreneurs to address gender-inequality in access to finance and support women to scale their ideas and drive economic growth.

National governments, businesses and civil society organisations can each track the performance of policies and programmes against gender equality metrics. Integrating gender equality into policies, programmes and performance measurement can help to ensure that interventions deliver fair benefits for all, identify gaps when they emerge and avoid inadvertently entrenching inequality.

Address inequalities in trade partnerships

- National governments can strengthen regulatory and governance capacity to ensure that investments and trade agreements deliver fair outcomes for sub-Saharan African countries and consumers. This includes improving legal frameworks around natural resource production and trade, imposing log export bans, introducing policies and penalties around illegal and/ or unsustainable activities, investing in on-the-ground governance and providing training in legal compliance for foreign investors and traders.
- National governments and regional bodies can strengthen opportunities for dialogue with trade partners to build trust and ensure that African decision-makers are involved in the investments shaping the region's future. For example, increased involvement in the Belt and Road Initiative could help the investments made by Chinese firms to deliver maximum benefits on the ground.

Section 3:

Taking a purposeful approach to sub-Saharan Africa's food and land use systems

This report has suggested four critical transitions to advance towards sustainable food and land use systems. However, challenges recur across each, undermining gains attained in some and blocking progress in others. Concerted action to address these systemic challenges could unlock benefits across food and land use systems at large.

The first challenge is to prepare for huge population and demographic shifts. Booming consumer markets and a young, ambitious population represent a huge opportunity. Yet population growth is prompting strains on natural resources to soar and there simply aren't enough jobs being created to meet demand.

Second, insecure land tenure across almost all countries in the region limits the ability of farmers and rural communities to invest in land to enhance productivity and sustainably manage resources. It also deters investors due to the risk of protracted negotiations and unclear ownership of assets.

Third, infrastructure remains chronically under-funded, despite its potential to support value-adding activities, strengthen rural-urban links and improve farmers' access to markets, finance and information.

Fourth, investment levels in food and land use systems do not come close to what's needed to drive transformation. Removing barriers to investment requires the finance community to reassess risks, develop innovative financing mechanisms and improve access to finance for all.

Addressing each challenge is critical. What can economic actors do to meet these challenges? The following sections describe a four-part action plan.

Accelerating the demographic transition to stable fertility rates

Accelerating the demographic transition to stable fertility rates would ease pressure on natural and infrastructural resources, reduce demands on the economy and unlock growth. This is particularly important in countries with the most rapid population growth but would deliver benefits across all rapidly growing countries in the region.

Easing the rate of population growth would slow the rise in demand for food, fuel and land, which places pressure on natural resources and drives increases in GHG emissions. If current population growth and food demand continues as projected, sub-Saharan Africa would need to more than triple its cereal yields by 2050 relative to 2010. Even if the FAO's healthy forecasts of yields doubling by 2050 are achieved, the region would likely have to expand cropland by roughly 100 million hectares and pastureland by 160 million hectares between 2010 and 2050.¹⁵²

This would also help spatial planners to manage shifting demands on natural and infrastructural resources. It is almost impossible to match infrastructural developments to the needs of rapidly growing populations in both urban and rural areas. This threatens to undermine food security, climate resilience (particularly in the most climate vulnerable countries), connectivity and broader services including health and education.

Slowing the rate of population growth would also help to meet growing job demand, improving people's livelihoods and the region's economic growth prospects. Today, economies in sub-Saharan Africa are not generating jobs fast enough to meet the demands of a growing working-age population. By catalysing a voluntary reduction in fertility rates, the region's labour force of the future could come of age into an economy with the capacity to absorb and unlock their productive potential.

Moreover, a demographic transition to stable fertility rates could unlock the "demographic dividend" – a one-time drop in the dependency ratio when the young population enter the workforce, increasing employment and economic growth – as seen across much of Asia.

Prompting a voluntary reduction of population growth rests on protecting and promoting women's rights.

Key actions include:

- National governments and civil society can partner to increase access to high-quality secondary education for girls. Women who receive high-quality education through to secondary school typically choose to delay the onset of their first pregnancy and have fewer children. Interventions include improvements in education provision, working with local communities to promote girls' education through social norms and scholarships for girls to attend secondary schools. This will require an estimated annual investment of US\$6.57 billion each year to 2030.¹⁵³
- Public and private sectors can partner with community leaders and civil society to provide women with contraceptives and engagement via women's networks to equip them to make their own reproductive choices and avoid unwanted pregnancies. Analysis conducted for this paper estimates a required annual investment of US\$891 million to 2030 to support this.¹⁵⁴ Significant progress has been made in Rwanda, one of the most densely populated countries in sub-Saharan Africa with a population set to double by 2050. A combination of high-level government commitment and community-led behavioural programmes saw contraceptive use increase from 17 per cent to 53 per cent between 2005 and 2015.¹⁵⁵ The fertility rate fell from 5.1 to 4 in the same period.¹⁵⁶ (See 36 in Case Study Catalogue.)
- National governments can increase investment in health services to reduce maternal and child mortality. Decreases in child mortality have been found to result in voluntary reductions in fertility rates. Key interventions include nutritional support in the first 100 days of life, vaccination programmes and increased access to child health services.

Local governments, civil society and community leaders can work together to shift social norms to promote family planning and women's empowerment. An example is the Sahel Women Empowerment and Demographic Dividend Project (SWEDD), which brings together religious and traditional leaders in the Sahel region to support women and girls' empowerment and improve access to quality reproductive, child and maternal health services.¹⁵⁷ (See 37 in Case Study Catalogue.)

Implementing comprehensive land reform

Recognising and promoting individual and community rights and responsibilities over land could lead to increased agricultural productivity and more sustainable land management. With the confidence that they will not have their land or assets arbitrarily taken, farmers and rural communities would have a greater incentive to buy agricultural inputs and invest in practices to boost productivity, while adopting sustainable practices that deliver benefits in the long-term. Importantly, rights and responsibilities would extend not just to private property but also to common lands, which are hugely valuable for grazing and woodland but are vulnerable to privatisation.

Land reform has equipped farmers and rural communities to adopt sustainable land management practices to restore land, improve food security and increase farmer incomes in Niger. (See 38 in Case Study Catalogue.)

Securing farmer and community rights over land – particularly for indigenous communities – can help to incentivise and enable investment in sustainable land management in the face of mounting pressures. This is critically important in countries with high forest cover or other critical ecosystems, given mounting pressures on natural resources.

Rainforest Foundation UK promotes community projects that protect the rainforests of the Congo Basin. In 2016, five communities representing over 10,000 people and 30,000 hectares of rainforest were granted legally binding land titles. As much as 75 million hectares of forest in the DRC (three times the size of the UK) could potentially come under community control in the future.¹⁵⁸ (See 39 in Case Study Catalogue.)

Land reform could also unlock business and private investment into food and land use systems in the region. Today, insecure land tenure represents a barrier to business engagement and investment. At best, unclear designations of ownership slow down the process of establishing operations in the region, driving up costs and stymying progress. At worst, insecure land tenure dramatically increases the risk of investment, as investors cannot be confident of the long-term security of their assets. This represents an urgent opportunity in countries with stronger or improving business environments, such as Namibia and Botswana, where secure land ownership systems could unlock the benefits of broader business-friendly reforms.

Finding ways to secure young people's access to land is critical to make on-farm activities a viable employment opportunity for the future. Rapid population growth means that parcels of land are getting smaller and are increasingly owned by older farmers. Boosting opportunities for young people to access land would incentivise them to enter agriculture and strengthen the economic resilience of those who do. This would reduce forced migration out of rural areas.

Recognising community rights and responsibilities over land also means involving them in decision-making. This is critical to the long-term success of interventions by ensuring that they respond to realities on the ground, leverage local knowledge and secure local buy-in to implement change. Interventions designed to empower women require particularly concerted engagement with local communities, as local attitudes can derail programmes and put women at risk if not factored into design and implementation.

Key actions centre around national, local and community leaders collaborating to recognise and promote rights and responsibilities over land through both official and traditional systems. Deploying digital technology can help to build and monitor a publicly available record of land titles.

Key actions include:

National and local governments and community leaders can partner to establish secure individual and community rights and responsibilities over land to enable farmers and entrepreneurs to access finance and increase investment in the region. Securing land tenure can be done in a number of ways, from legal documentation to recognising the legitimacy of traditional landholding agreements. Efforts should pay particular attention to women, youth and indigenous groups.

In Rwanda, a digital land registration programme is supporting stable and transparent property rights. By 2017, seven million people had collected their titles and registrations of sales, purchases and other kinds of transfers were rising.¹⁵⁹ (See 40 in Case Study Catalogue.)

- **Businesses and development agencies can respect the law and recognise traditional models of land tenure** to prevent the advance of land grabs. Responsible businesses should proactively ensure that land acquisitions do not compromise people's property rights or livelihoods. Companies can engage with the local communities to ensure that acquisitions only go ahead with the consent and compensation of all relevant parties.
- Governments can introduce measures to improve young people's access to land to enable those who want to enter agriculture to do so. Opportunities include policies and regulations to incentivise rental markets.
- Local governments and farmers can create platforms for farmers and communities to engage in decisionmaking around landscapes and natural resources to ensure that interventions address realities on the ground and secure local buy-in.

Civil society network, the Access Initiative, brings together organisations, groups and individuals working to ensure that citizens have the right and ability to influence decisions about the natural resources that their communities depend on.¹⁶⁰ (See 41 in Case Study Catalogue.)

Funding dramatic infrastructural improvements

Scaling up sustainable rural infrastructure is a key driver to increase agricultural productivity and the supply of nutritious food, enhance the value of agricultural produce, capture benefits from mounting food demand particularly from urban areas, catalyse market growth, improve food safety and – if carefully managed – ease pressure on natural ecosystems.

Improved infrastructural connections would facilitate yield improvements and make them more worthwhile. Better roads would improve farmers' access to markets to buy productivity-enhancing inputs like seeds, tools and machinery and to sell their produce. Enhanced electricity access is critical to run machinery and access information on markets, agricultural practices and more. Greater connectivity would also equip farmers to access finance, enabling them to invest in their land.

Value chain improvements would make these productivity enhancements more worthwhile for farmers and increase the supply of available, nutritious food. Insufficient transport and storage facilities cause dramatic food losses and the nutritional content of produce to decline. Estimates vary significantly but reducing post-harvest losses of grains by just 1 per cent could lead to economic gains of US\$30-40 million each year, with most of the benefits accruing to smallholder farmers.¹⁶¹ The calorie content of lost grain alone could feed the population of Kenya (48 million people) each year.¹⁶²

In particular, strengthening infrastructural rural-urban linkages would boost the food security of urban populations and enable farmers to benefit from mounting urban food demand, by reducing the time and money spent getting food across the value chain. Stronger rural-urban linkages would enable domestic farmers to displace imports and



meet mounting food demand from the forecast 800 million urban dwellers by 2050 – benefiting both producers' pockets and consumers' stomachs.¹⁶³

By providing a hub for aggregation and processing facilities, well-connected secondary and tertiary cities can also enhance the value of the region's agricultural produce. Entrepreneurs can tap into greater economies of scale, service value-adding activities and generate more off-farm agricultural jobs.

The Nacala Growth Corridor in Mozambique has supported infrastructural and transport improvements coupled with regulatory reforms, which have increased cashew and maize processing activity in the region.¹⁶⁴ (See 42 in Case Study Catalogue.)

Stronger infrastructural connections would also ease the journey of rural dwellers wishing to move to urban centres, freeing up rural land and paving the way for land consolidation in certain areas. For generations, urban centres have provided seasonal work for many rural dwellers.

Enhancing infrastructure is critical to improve food safety. Foodborne hazards – often a result of inadequate storage and transportation – cause 91 million people to fall ill each year, costing the region US\$16.7 billion in annual productivity losses.¹⁶⁵ Decreasing the time that produce is exposed between harvesting and reaching the consumer can help to avoid the development of toxins, such as aflatoxins.

Finally, developing alternative energy sources to fuelwood and fossil fuel generators would help to ease pressures on sub-Saharan Africa's forests. Decentralised renewable energy sources are emerging that can help to meet energy demand even in remote areas. Solar energy presents particularly compelling opportunities, given the sunny climate in many areas, plummeting costs of solar panels and the potential for decentralised mini-grids that can overcome infrastructural deficiencies.

Embedding sustainability into infrastructural project planning and governance is critical to avoid improved capacity resulting in the destruction of natural capital. For example, improved road access can result in increased deforestation as previously inaccessible forests become penetrable. Likewise, unless carefully managed, large-scale irrigation programmes can result in over-extraction of groundwater, compromising the ability to mitigate drought conditions and causing salinisation in certain (often coastal) areas.

At an estimated US\$30-36 billion per year to 2030, the scale of the investment required to improve rural infrastructure is small compared to the immense transformative potential.¹⁶⁶ These investments would support improved access to roads and electricity, enhanced internet connectivity and the provision of clean cooking fuels and technologies to reduce dependence on wood fuel.¹⁶⁷ A cross-sectoral international partnership could mobilise the capital for this investment, support project development, and drive the growth of integrated value chains.

Key actions include:

- The development finance community and national governments can dramatically scale investment in rural infrastructure to increase agricultural productivity and value-adding opportunities, improve access to input and output markets, reduce transaction costs and incentivise sustainable practices. The spread of solar power represents a promising development, bringing electricity access to millions across the region without contributing to increased GHG emissions.
- National governments and agribusinesses can invest in storage and handling solutions to reduce post-harvest losses and increase profits. This includes grain bags, silos and containers, cold storage and innovations like gum Arabic coating for fruits and vegetables to delay ripening.
- Domestic companies can invest in agro-processing capability to enhance the value of locally produced food. This represents a huge opportunity for local businesses to displace food imports, diversify their business models and meet mounting demand for nutritious food.
- Governments can increase investment in "soft infrastructure" and safety nets to enhance stability and quality of life, underpinning long-term equitable growth. Strengthening education and communication services is critical to build human capacity, support agricultural R&D and equip the next generation of farmers and food entrepreneurs. Investing in productive safety nets will ensure gains are protected and maintained. Extending the safety net programme that has delivered benefits for the poorest in Ethiopia (see below) across sub-Saharan Africa would cost an estimated US\$5 billion each year to 2030.¹⁶⁸

Ethiopia's Productive Safety Net Programme provides millions of households with cash and food payments for engaging in public works including building local infrastructure or protecting the environment. Payments to poor and vulnerable households with limited labour capacity are unconditional.¹⁶⁹ (See 43 in Case Study Catalogue.)

Entrepreneurs can deploy technology to improve farmer access to infrastructure through a "sharing economy".. Hello Tractor, Africa's "Uber for the Farm", enables smallholder farmers to connect with tractor owners via a digital platform and SMS service, where they can secure access to a tractor or other equipment inputs to boost yields and reduce post-harvest losses. The company has captured 75 per cent of private commercial inflows to Nigeria, expanded to five markets and supported over 250,000 farmers across Africa.¹⁷⁰ (See 44 in Case Study Catalogue.)

Removing the barriers to investment across food and land use systems

Transforming food and land use systems in sub-Saharan Africa will require additional investment in the order of US\$85-100 billion each year of long-term finance.¹⁷¹

This includes:

- US\$30-36 billion to improve rural infrastructure, including better roads to support access to markets, improved access to electricity, enhanced internet connectivity and clean cooking fuels and technologies.
- US\$22-24 billion to strengthen agricultural value-chains and markets in sub-Saharan Africa by 2030. This includes cold and dry storage and business training for new agricultural entrepreneurs.
- US\$12-14 billion to equip farmers to support sustainable agricultural yield increases in the region. This requires the provision of extension services, training from specialist agronomists, increased irrigation efficiency and investments in agricultural research and development to develop high-quality inputs and tools.
- US\$7.28 billion to provide women with access to education and sexual and reproductive health services.
- US\$9-13 billion to restore sub-Saharan Africa's forests (including mangrove forests) and afforest new areas by 2030.
- US\$5 billion to provide public safety nets for communities to support resilience to climate change.

Although this may be small compared to the size of the global economy, it represents 5 per cent of sub-Saharan Africa's GDP and just under triple annual FDI into the region across all sectors, which has been on average US\$36 billion over the past decade.¹⁷² Additional investments will also be required for further interventions, including fully closing the yield gap with the rest of the world, providing access to roads and the internet for all and supporting processing, packaging and other off-farm activities across the value-chain.

Today, investment levels do not come close to the size required to transform food and land use systems in sub-Saharan Africa. (See Map 1.) Only nine governments have met CAADP commitments to spend 10 per cent of GDP on agriculture. The region receives just 7 per cent of foreign direct investment (FDI) stock in agriculture in developing countries.¹⁷³ For those funds tracked, the Climate Funds Unit found that between 2003 and 2018, only US\$4.5 billion of climate finance was approved for the region, with half allocated for climate adaptation. That is less than 5 per cent of the forecast US\$50 billion annual climate adaptation finance needed in the region each year by 2050.¹⁷⁴

Globally, multilateral development banks (MDBs) spend less than 10 per cent of their climate finance portfolio on agriculture. Less than 3 per cent of official development assistance (ODA) was allocated to agriculture between 2001 and 2017 and multilateral development banks' (MDBs) exposure to agriculture amounts to less than 10 per cent of their climate finance portfolios.

Under-investment in the food and land use system is even more acute in sub-Saharan Africa and stems from major inefficiencies in how food and land use systems are financed. (See Exhibit 13.)





Source: Climate Funds Update, 2019. Available at: https://climatefundsupdate.org/data-dashboard/#1541245745457-d3cda887-f010

Key challenges include:

Credit risks linked to food and land use assets in sub-Saharan Africa are among the highest in the world. Low skilled farmers are not straightforward candidates for traditional lenders like commercial banks: they tend to lack clear land rights or other significant assets to use as collateral and do not have a track record or financial history.

Political and regulatory uncertainty in many countries across the region dampens investor interest as it can increase the risk of defaults and compromise returns on investment, including through unforeseen regulatory barriers and unclear enforcement mechanisms. **High currency volatility**, linked to economic instability, increases the cost of currency hedging, which puts off foreign investors with other currencies in their portfolio.

The high cost of capital results from a combination of perceived risks, high up-front costs of investment and the small-scale and disaggregated nature of many projects, which makes them expensive to reach and evaluate. Farmers seeking investment are often served by intermediaries, including microfinance institutions and value chain actors with capital, which provide more than 75 per cent of smallholder finance. Yet these investments are often limited and can be expensive.

Underdeveloped capital markets limit the pool of domestic finance available to provide long-term financing for projects, including much-needed improvements to rural infrastructure which increases efficiency (including mechanisation and electrification) and improves access to markets (including roads, refrigeration and storage). Tapping into domestic pools of capital through the increased savings available from a youthful population represents an emerging opportunity to finance the region's infrastructure needs. This will be paramount to achieving the region's growth targets.

Limited data quality makes it harder for investors to evaluate creditworthiness or identify trends that can significantly impact risk profiles (such as weather patterns, incidence of pests, market access and more). This leaves them further exposed to climate-related risks as well as other regulatory risks which can affect the credit rating of borrowers, like changes to land management codes, mandatory payments of carbon liabilities or subsidy reforms.

Where data is available, traditional risk assessment methodologies are not capturing the hidden costs of physical risk exposure or subsidies in food and land use systems. Risk assessments in sub-Saharan Africa, as in other parts of the world, tend to be relatively simplistic, with agriculture still treated as a high-risk extractive industry and lending carried out against land or other assets. This means that other risks – both physical (such as extreme weather events, changing weather patterns, water scarcity, and soil erosion) and transition (for example, repurposing of agricultural subsidies and shifts in consumer preferences around meat and nutrition) are not factored into investment decision-making. Investors are often unaware that they are holding "4 degree" agricultural portfolios.

EXHIBIT 13

Barriers to investment in food and land use in sub-Saharan Africa



Unlocking finance flows requires a more targeted and catalytic use of public finance. Governments and development finance institutions can scale support to food and land use systems and target efforts at high impact and underserved areas. For example, these groups can provide working capital (affordable finance, used by companies for their operations) to intermediaries to on-lend to smallholder farmers or infrastructure projects.¹⁷⁵ Concessional capital should also be used much more catalytically to crowd in more private investment, by deploying instruments like guarantees, which typically lead to higher private capital mobilisation ratios but currently make up only 4 per cent of MDB climate finance transactions.

Key actions that different stakeholders can take include:

Building an enabling environment

- National governments can introduce and implement policies and regulations that create stability and improve ease of doing business to increase investment into sub-Saharan African food and land use systems. These include simplified compliance processes, clear and consistently applied enforcement procedures, increased transparency, stronger land tenure regimes and economic stabilising practices to reduce currency volatility.
- Strengthening local capital markets and local commercial banks to create liquid local currency markets that can lend to local farmers and entrepreneurs and bypass currency risk. As a young population grows in the region, individual savings are forecast to increase and could be invested in the country's growth. For example, the government of Nigeria has set up a local guarantee provider (InfraCredit) to de-risk investments in infrastructure, in an active effort to mobilise the country's pension savings base towards investments in the local infrastructural needs, providing an alternative to high-yielding government bonds. Similar initiatives could be set up for agricultural investments.

Improving risk profiles

- Financial institutions can assess and manage climate-related risks embedded in current systems by implementing the recommendations of the Task Force for Climate-Related Financial Disclosures (TCFD) in order to properly assess physical and transition risks related to climate events. Adequately pricing these risks should serve to redirect investment towards sustainable projects. Regulators can make TCFD disclosure mandatory and extend the exercise to other nature-related and biodiversity risks.
- **Commercial banks can leverage technology to improve data collection and build a more robust risk profile for the sector.** Innovative, tech-based financing models can overcome some of the current data gaps that prevent farmers and entrepreneurs from accessing finance, while also equipping commercial banks to improve their understanding and assessment of risk in food and land use systems. Innovations include using mobile payments as credit history, digitally verifying warehousing receipts and accepting them as collateral, and leveraging GPS functions on mobile phones to confirm land locations and use.
- **Development finance institutions can increase the use of blended finance instruments and structures** to mobilise private investment in sub-Saharan African food and land use systems including development guarantees, first loss equity and insurance products. Africa receives 15 per cent of global blended finance for sustainable land use in developing countries, a much smaller share than the 42 per cent of blended finance for clean energy that goes to the region.¹⁷⁶ The Africa Agriculture Trade Investment Fund finances agricultural businesses and local financial institutions using a three-tiered structure with different risk and return profiles at each level, including first loss provided by governments.¹⁷⁷ (See 45 in Case Study Catalogue.) Similarly, the Livelihoods Fund for Family Farming (L3F) uses investments from a range of partners to support sustainable farming projects that deliver benefits to partners from multiple sectors. (See 46 in Case Study Catalogue.)

CDC, the UK development finance institution, is championing a blended finance solution to mobilise capital for rural infrastructure in sub-Saharan Africa through its investment in SunCulture, a solar irrigation company serving smallholder farmers in Kenya. This technology enables farmers to increase productivity while reducing costs and GHG emissions by diminishing water, fuel and fertiliser inputs. The company's new solar-powered water pump can be accessed through a pay-as-you-go financing model for smallholders who may not have the ability to purchase this kind of infrastructure up front. (See 47 in Case Study Catalogue.)

Recognising the opportunity for impact

- Donor governments can increase ODA allocations to food and land use, recognising the role that these systems
 play in reducing poverty and driving resilient economic growth. ODA and development capital could also be
 linked to specific reforms and implementation (for example, subsidy repurposing or training on regenerative
 practices) or to increasing capacity of intermediaries that are already present on the ground such as AgDevCo.
- Development finance institutions can increase climate finance allocations flowing to sub-Saharan Africa to support the region's stability and prosperity and maximise the environmental and economic impact of investments. The recent emergence of funds like the Green Climate Fund, the Least Developed Countries Fund and increased Global Environment Facility spending in the region represents a positive step forward.

Developing and expanding the project pipeline

 Development finance providers and private investors can partner to incubate projects and bring them to commercial scale. For example, AgDevCo's Smallholder Development Unit provides up to US\$800,000 for smallholder out-grower schemes to support initial set-up and operational costs. This helps farmers to reach economies of scale and catalyse relationships with agribusinesses, which can help them to reach commercial scale.¹⁷⁸ (See 48 in Case Study Catalogue.)

In the Gola Rainforest region of Liberia, Partnerships for Forests and partners are working to develop a rainforest-friendly Gola Rainforest Cocoa brand and product that is produced within biologically diverse agroforestry systems in the Greater Gola landscape. Cocoa farmers will be trained in sustainable practices that increase yields while conserving forests, including agroforestry and the production of forest-smart beans. Work on the value chain will aim to ensure a sustainable supply of beans for market and develop safe and secure transport that maintains the quality of the cocoa. (See 49 in Case Study Catalogue)

Entrepreneurs can develop innovative financing, business and payment models to improve farmer and SME access to finance. Innovative models can help overcome key barriers to investment including lack of collateral and remoteness from potential investors. These include pay-per-use service models, shared services (as pioneered by Hello Tractor), and online platforms to connect farmers with buyers and high-quality input (fertilisers, seeds, tools) providers.

Section 4:

Conclusion



There is a massive opportunity for sub-Saharan Africa's young and ambitious population to build a brighter future for billions of people and the natural systems on which they depend. As the backbone of many of the region's economies and the lifeblood of millions of people, food and land use systems will play a critical role in sub-Saharan Africa's development. Already, African countries, businesses and communities are leading inspiring and impactful activities across food and land use systems, showing the way for future efforts.

Partnerships between sub-Saharan African countries are a powerful and promising development. So too is international collaboration: an unprecedented effort is needed to transform dynamics in international value chains and global trade, meet the investment levels required and unlock benefits from supporting geo-political stability to ensuring greater prosperity and equality to mitigating global climate change.

This report offers all actors an initial roadmap which can be started on today. Seizing this moment represents a chance to shift the trajectory of sub-Saharan Africa's food and land use systems to become drivers of sustainable economic growth, setting the region on a course for future stability and prosperity. The time to act is now.

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