CDC
Investment works

Evidence Review

Insight

Investing for impact in the food and agriculture sector in Africa and South Asia

Insights from evidence and our experiences investing in the sector

Insight is a series of practical and digestible lessons on the issues of private sector investment and development. They're based on our experiences, knowledge and research and are aimed at investors, businesses, development professionals, and anyone with an interest in private sector development.

Impact Study: 015
Published: November 2020

CDC leads:
Gieltje Adriaans and
Nabeela Khan

gadriaans@cdcgroup.com
nkhan@cdcgroup.com

To view the rest of our Insight series visit:
▸ cdcgroup.com/insight

Foreword

We are pleased to publish this evidence review on investments in the food and agriculture sector.

Since our founding in 1948, we have supported over 400 companies in the sector using a mixture of direct equity, funds and debt as well as through the non-financial value we bring through our networks, expertise and technical assistance.

As a development finance institution, we have a dual mandate; to support business growth that lifts people out of poverty, and to make a financial return, which is then reinvested to further improve the lives of people in Africa and South Asia. Over the past year, we have worked with a multidisciplinary team at Wageningen University & Research, a leading institution in the space, to refresh our understanding of the evidence and better understand the impact of our investments. We are grateful to the Wageningen team for constructively challenging our assumptions and helping us to improve our impact framework.

This report highlights the main insights from the evidence and outlines key opportunities for investors who, like CDC, are looking to align their financial returns with impact returns.

Jean-Guillaume Habay
Head of Food & Agriculture
CDC Group plc

Contents

Foreword 2

Introduction 3

01. Economic opportunities 6
- 1.1 Development challenge 6
- 1.2 Key insights 6

02. Food security & nutrition 9
- 2.1 Development challenge 9
- 2.2 Key insights 10

03. Environmental sustainability 12
- 3.1 Development challenge 12
- 3.2 Key insights 12

04. Trade-offs and risks to impact 15

References 17

Acknowledgements

We are grateful to Cecile Kusters, Monika Sopov, Cor Wattel and Hermine ten Hove as well as numerous academic experts at Wageningen University & Research for their review and valuable perspectives on the evidence and resulting recommendations.

We would also like to thank a range of external parties who generously donated their time to participate in our external stakeholder consultations throughout this process, including at FCDO, IFC, CGIAR-CCAFS, Bill & Melinda Gates Foundation and Rabobank.

For questions please contact
Nabeela Khan
nkhan@cdcgroup.com

Introduction

The food and agriculture (F&A) sector is key to our development agenda and contributes to many of the UN's Sustainable Development Goals, either directly or indirectly. We invest across the F&A value chain – from agricultural inputs such as seeds and fertilisers, farming of food and non-food crops, to processing and distribution. We also invest in enabling infrastructure that is important for the F&A system to flourish.

A large body of literature exists on the role of agriculture for development. We have not tried to capture this in its entirety but have rather focused on the evidence that is most relevant for private sector development and can help CDC and other investors in their investment decision-making to optimise for impact.

Based on this review, our framework is focused on three long-term impact goals:

- **Economic opportunities:** Through our F&A investments, we aim to scale responsible businesses, enhance productivity and improve market access and linkages for rural communities and farmers, leading to more and better-quality jobs and livelihoods, stronger agricultural economies and inclusive economic growth.
- **Nutrition and food security:** We seek to increase the availability and accessibility of agricultural goods and put more nutritious food on the market, with the longer-term goal of improved food security and nutritional outcomes in our focus geographies.
- **Environmental sustainability:** We want our investments to contribute to greenhouse gas emission reductions, minimise food waste and loss, increase resource efficiency and improve natural resource management, with the long-term goal of protecting natural capital and transitioning to net zero and resilient food systems.

The team at Wageningen University & Research conducted a rapid assessment of the literature to ensure our Food and Agriculture Impact Framework (see Fig. 1 below) and investment activity is informed by the latest and best-in-class findings, as well as engaged with external stakeholders including sector experts, academics, investors, grant makers and businesses.

Through our F&A investments, we aim to contribute to three long-term impact goals: economic opportunities, nutrition and food security and environmental sustainability.

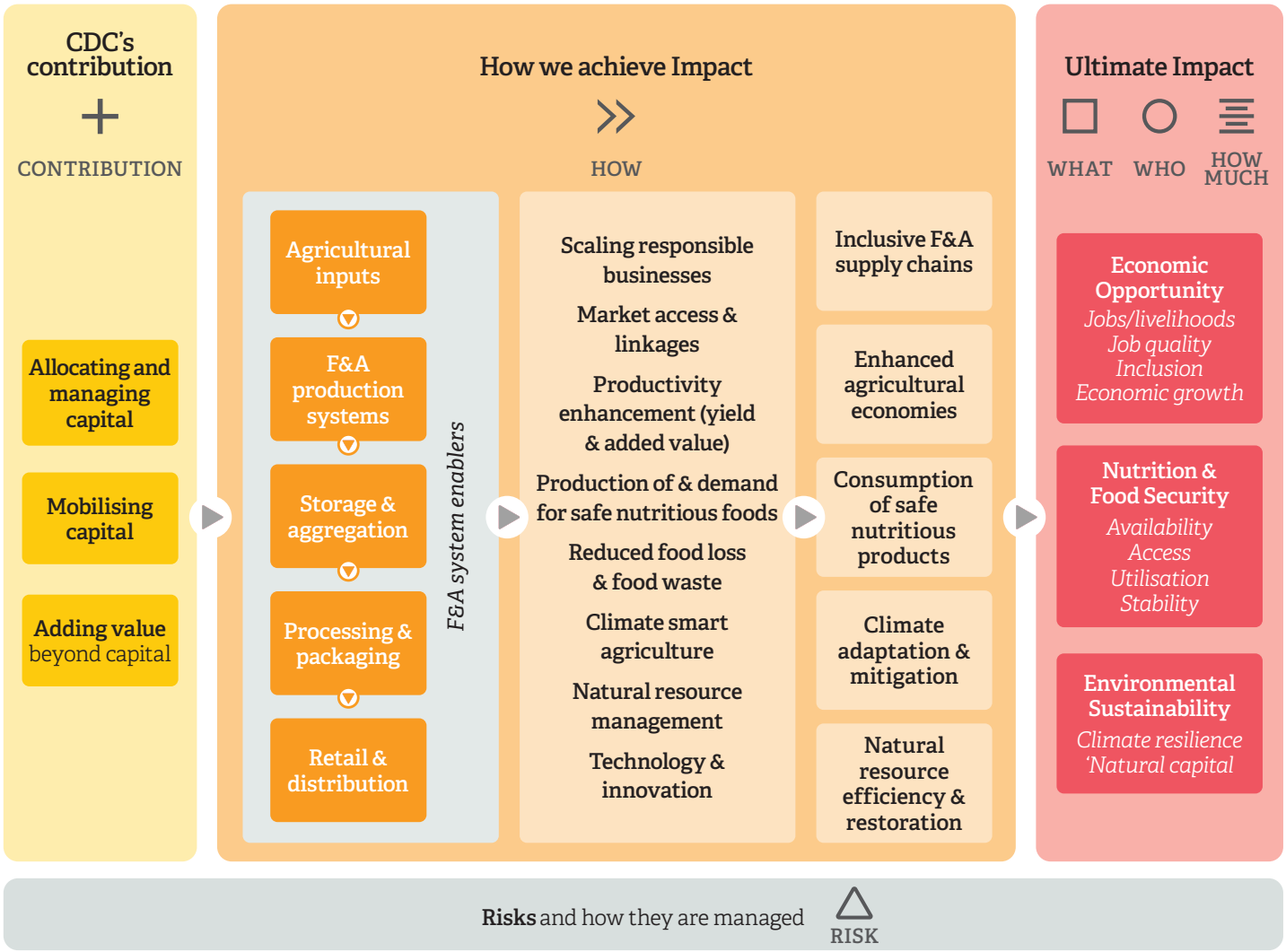

Figure 1: CDC's Food & Agriculture Impact Framework

Before describing the evidence base and assumptions underpinning this framework in more detail, the review identified three overarching points:

- First, any F&A investment needs to be considered as part of a *dynamic and inter-linked system*. A systems perspective helps to step away from linear thinking about causalities, and allows for interdependencies, reverse causalities and trade-offs. Any investment will bring change and needs to be analysed for both direct and indirect impacts as well as impact risks.
- Second, while the evidence may support a certain approach to investing for impact generally, what works in one place may not work in another and *context-specificity is key*. It is therefore important to assess and monitor the impact of each investment individually, both pre-investment through impact due diligence and post-investment through impact monitoring and management.
- Third, it is important to consider the *wider enabling environment* needed to support any investment. There may be deficiencies in the regulatory and legal framework at a market or country level, for example, or other constraints that need to be addressed for F&A systems to function properly. Private sector parties need to collaborate with other stakeholders to optimise the impact performance of their investments.

In the subsequent sections of this report, we will summarise the evidence for each of our three ultimate impact objectives in turn and share experiences from our portfolio.

What is CDC's approach to impact?

Sector impact frameworks are aligned with CDC's overarching Impact Framework. In line with the Impact Management Project's dimensions of impact, we analyse the impact of each investment in terms of:

- *What* is the type of impact?
- *Who* ultimately benefits in terms of people and planet?
- By *how much* in terms of scale and depth?
- What is the likelihood the impact will be different than expected (*impact risks*)?
- What is our role in achieving the impact (*contribution*)?

In addition, we analyse how this impact is achieved through short-term outputs and medium-term outcomes including:

- The *direct* impact of our investments;
- The *indirect* impact of our investments, e.g. through economic enablers; and
- The impact of our investments on shaping and *catalysing markets*.

01

Economic opportunities

1.1 Development challenge

The majority of people living in poverty reside in rural areas and rely on agriculture for their livelihoods. Despite high urbanisation rates, most of them will likely remain rural by 2030. Agriculture is a major source of income and accounts for approximately 70 per cent of total employment in low-income countries globally. Over the next 15 years, about 1.6 billion people in low- and middle-income countries will be reaching working age. Food systems will contribute a significant share of jobs, through both wage- and self-employment, in these countries (Townsend et al. 2017).

At the macro level, increasing agricultural production in Africa is important for economic growth and stability. Total food production in sub-Saharan Africa has been growing at a slow rate and the continent still relies on imports for approximately one third of consumed calories (AfDB 2016). Falling commodity prices have also created a need for many countries whose economies depend on natural resources to diversify exports and foreign exchanges earnings.

1.2 Key insights

F&A investments lead to business growth and productivity enhancements of investee companies. Development finance institution (DFI) investments in the F&A sector tend to create more jobs than other sectors in the economy

According to a 2013 study by the Overseas Development Institute, DFI investments in the agriculture sector support the most employment due to the labour intensity of the sector. They tend to create direct and indirect employment impacts and have a significant effect on labour productivity. However, such investments might not always contribute as much to long-term economic development compared with more capital-intensive sectors – which may on average lead to fewer additional jobs but have more potential for long-term structural transformation and create employment opportunities outside the agriculture sector.

70%

Agriculture accounts for approximately 70 per cent of total employment in low-income countries globally.

Investors can optimise their job creation impact by targeting more labour-intensive sectors

At our portfolio level, we are already incentivised to invest in less developed economies and more labour-intensive sectors through our 'Development Impact Grid', a screening tool that helps us assess every investment for its potential to create jobs. In a similar way, investors looking to maximise direct job creation within F&A portfolios can prioritise investments in subsectors that are more labour intensive and hard to mechanise. Depending on the business model, this can be assessed through comparing the number of jobs created per hectare or per dollar of revenue, for instance. At the same time, companies that are competitive and productive can accelerate value chain modernisation and contribute to agricultural transformation.

Investing in later, or 'downstream' stages of the value chain, such as processing facilities, could stimulate employment and have wider economic effects

For example, Africa currently exports almost 70 per cent of the world's raw cocoa, but only 16 per cent of ground cocoa, which is typically worth 2-3 times more per ton (AfDB 2016). However, evidence on the economic impacts of investments in later stages in the value chain is much scarcer than for primary production or farming. Investors can help address this evidence gap by measuring the impact of these investments and sharing lessons.

Large firms tend to have higher productivity growth than smaller firms

Cross-sector research shows that large firms tend to have higher productivity growth than small firms (Ayyagari, Demirgüç-Kunt & Maksimovic 2018). They are able to exploit economies of scale, invest more in research and development and are able to attract human capital. They also typically support higher quality and more stable jobs than small firms. The study does not however not distinguish these findings by sector.

Outgrower schemes can lead to better farmer incomes

There is a significant body of literature on outgrower relationships. Analysis by the World Bank confirms that, for marketing interventions such as farm-group arrangements, results are mostly positive on yields, crop prices, profits and value of production. Positive results are mostly due to improved access to modern inputs, farming technology and wider markets, which in turn result from participating in value-chain or contract activities (World Bank 2011).

A systematic review of contract farming by Ton et al. (2017) shows positive income effects for smallholders in contract farming arrangements, covering 26 empirical instances of contract farming in 13 developing countries. The type of contracts however varied widely, with firms providing different service packages to farmers. For contract farming arrangements to survive over time, firms need to offer farmers above-local market prices to keep the arrangement attractive and to prevent farmers from dropping out. However, the authors caution that unsuccessful schemes are systematically underreported and that studies typically focus on cases where initial start-up problems were already overcome, potentially leading to selection bias.

The evidence on how F&A companies can effectively improve outcomes for smaller producers is however mixed

The evidence on how companies can successfully build more inclusive supply chains is mixed. Dalberg and Wageningen Centre for Development Innovation (2018) conducted an exploratory study into 16 different approaches and their effects on smallholder income as well as broader outcomes. Three of these approaches, including outgrower schemes and contract farming, were found to raise incomes by more than 50 per cent across contexts. However, looking beyond farmer incomes, the review did not identify any approaches that performed strongly across four of their selected criteria: a step-change in income, sustained over time, and reached male, as well as female farmers at scale. Across the most successful interventions and case studies identified, the researchers noted four critical success factors: bundling services, connecting deeply with farmers, customising interventions and partnering with governments, civil society actors and peers.

70%

Africa currently exports almost 70 per cent of the world's raw cocoa, but only 16 per cent of ground cocoa, which is typically worth 2-3 times more per ton.

Outgrower schemes tend to reach a relatively limited number of small-scale farmers, and often not the poorest – this requires innovative approaches and capacity building

In a recent World Bank evaluation of private sector interventions, the agribusiness case studies found that it is easier to integrate relatively larger farmers in the supply chain (World Bank 2019). Innovative financing solutions and capacity building are key to reach smaller farmers. Likewise, the literature on outgrower relationships also indicates that the number of small-scale farmers who are able to take advantage of global market opportunities is small relative to the total number of small-scale farmers at 2-10 per cent (Gneiting and Sonenshine 2018). Likewise, Ton et al (2017) indicate that the poorest farmers are rarely participating in contract farming arrangements.

There are persistent gender gaps in F&A systems – adopting a gender lens is vital to achieve more equal economic opportunities for women

Women have unequal access to and control over productive assets and incomes despite contributing a significant share of agricultural labour (DfID 2014). Economic transformation offers new opportunities for entrepreneurship, wage labour and social empowerment, but women often benefit less from these than men. Successful country-specific solutions have focused on addressing the most important barriers or enhancing women's participation in markets that they are already active in (DCED 2017). Case studies show that companies are often not aware of gender dynamics, which can lead to missed opportunities as well as impact risks (CSR-Asia 2017).

Impact investors can support the replication of successful inclusion models and practices by sharing lessons learned

This requires investors to set up effective monitoring systems and capturing and sharing lessons, both on successes and failures. Technical assistance will likely play an important role in this. This includes being more transparent about the living wage gap by monitoring the wages and farm incomes related to their investee companies compared to living wage levels in the country.

Case study: Supporting economic opportunities in Malawi

Jacoma Estates is an agribusiness which manages over 1,600 hectares of land in the north of Malawi, growing and sourcing macadamia nuts, bird's eye chilis and paprika for export. The business currently employs just under 1,000 people, of whom more than one third are women.

The company also works with over 5,200 neighbouring smallholder farmers, connecting them to export markets and supporting them with agri-inputs and technical assistance to enhance their productivity and meet quality standards required for exporting.

In 2016, we made an $8 million investment in Jacoma to help the company grow, create more jobs and expand its outgrower scheme. Jacoma contributed $1.3 million to the local economy since 2016 by buying from smallholders and is introducing traceability to individual farmers, which has attracted interest from multinational companies. The business plans to share irrigation infrastructure with nearly 700 smallholders, boosting their resilience to volatile weather conditions and climate change.

The company has introduced local processing for its macadamia nuts and spice products which helps to capture more added value in-country compared to exporting unprocessed goods, as well as supporting export diversification and the development of a competitive macadamia export industry.

02

Nutrition and food security

2.1 Development challenge

Good nutrition is essential for sustainable development. It contributes to cognitive and human development, higher labour productivity as well as better health and earnings later in life. The world is however experiencing a "triple burden of malnutrition" due to both under- and overnutrition (Townsend et al. 2016). These challenges are particularly relevant for the countries where we invest, as an increasing population, rising incomes, changing demographics and urbanisation will increasingly create a need for more and better-quality food.

Malnutrition can be broken down into three types (Malabo Montpellier Panel 2017):

- Some 820 million people – the majority in sub-Saharan Africa (1 in 4 people) and South Asia (1 in 6 people) – suffer from *undernourishment*. They do not have access to sufficient calories for their physiological needs, which can lead to the health problems of stunting and wasting. It is estimated that the world needs to close a food gap of 56 per cent, equivalent to 7,400 trillion calories per year, to be able to feed nearly 10 billion people by 2050 (World Resources Institute 2018).
- Worldwide more than 2 billion people have *micronutrient deficiencies* with an intake of vitamins and minerals that is below a healthy threshold. The most common deficiencies are iodine, vitamin A, iron and zinc, while pregnant women are especially vulnerable to low levels of calcium, vitamin D and folate.
- Often considered a high-income country problem, *overnutrition* is increasingly becoming an issue in low- and middle-income countries, especially in urban areas. In Africa, the number of overweight children under five has increased by nearly 24 per cent since 2000, while almost half of the children under five who were overweight or obese in 2019 lived in Asia (World Health Organisation 2018).

820 million

people worldwide suffer from undernourishment.

2 billion

Worldwide more than 2 billion people have micronutrient deficiencies.

2.2 Key insights

The private sector has an important role in increasing the production and distribution of nutritious foods

This includes both naturally nutritious foods (for example, proteins or fruits and vegetables) as well as foods which contain added micronutrients (for example, biofortified staple foods and condiments). There is strong evidence that such investments can lead to improved nutritional outcomes (MQSUN+ 2018; Jenkins, Byker Shanks and Houghtaling 2015). Before pursuing an investment, a baseline assessment can help an investor understand the expected nutritional impact of an investment, for example, through using publicly available data or through collecting primary data. For example, investing in a company that increases local access to protein is expected to have more nutritional impact in a country where protein intake is low.

The private sector has an important role in increasing the production and distribution of nutritious foods.

What is 'nutritious food'?

Nutritious food is defined as "food that, in the context where it is consumed and by the individual that consumes it, provides beneficial nutrients and minimises potentially harmful elements", according to the Global Alliance for Improved Nutrition (GAIN).

Improving food security and nutritional outcomes will however not be achieved by increasing agricultural production alone

There are four elements that need to be in place to improve food security outcomes (FAO 1996; FAO 2008):

- The *availability of food* is determined by food production, stock levels and net trade. Investors can monitor this through company data such as tonnes of food produced and sold.
- People's *access to food* depends on their incomes, expenditure, markets and prices. Investors can observe this through market research and by comparing prices with income levels.
- *Utilisation of food* refers to the ability to consume food safely and properly. This includes proper preparation, processing, cooking and storing of food for nutritional, psychological and social wellbeing, in line with the culture and community surrounding a household, along with knowledge of health and hygiene to reduce the risk of sickness from foodborne illnesses.
- The fourth factor of *food stability* is about maintaining food availability, access and utilisation over time. This can be interrupted for transitory reasons (such as natural disasters, drought, civil conflict, price hikes, unemployment), seasonal reasons (the regular pattern of growing seasons affecting food supply) or chronic reasons (e.g. poverty preventing ongoing access to adequate food).

Uptake of nutritious products requires demand creation, proximity distribution networks and cooperation

Reaching people with nutritious products can be challenging for companies, especially when consumers reside in more remote and less densely populated areas. Developing innovative and low-cost last-mile distribution networks, for example through a community sales force, can help in reaching remote communities. Creating demand involves raising awareness among consumers and marketing nutritious products. The private sector can cooperate with government and civil society initiatives to improve awareness on the benefits of nutritious products. This could include helping to develop guidelines for healthy and sustainable diets, for example (HLPE 2017).

Food safety is also key to improving nutrition and food security, and the private sector plays a central role in assuring this

"There is no food security without food safety," according to the FAO, referring to the impact of foodborne diseases on developing country consumers. Most of these diseases are the result of consuming fresh, perishable foods sold in informal markets. While urbanisation will spur growth in modern retail, the informal sector is expected to retain a large share of the market. The burden of foodborne illness is also expected to rise as consumption of risky foods increases and value chains lengthen and broaden (Grace 2015).

The private sector plays a key role in improving food safety in response to public and market demands. The private sector can help improve food safety standards through innovation and technology, labelling and standards, monitoring and surveillance, together with institutions and policies designed to improve food safety governance and control along food supply chains.

The private sector can have a direct positive impact on nutrition outcomes through improving workforce nutrition

Agricultural companies typically have large rural workforces. Workforce nutrition can have a positive impact on a company's bottom line due to reduced employee absence, increased employee retention as well as improved staff morale and performance (MQSUN 2018). But research in this area is still scarce.

The private sector can also have negative effects on food security, nutrition and health outcomes, either in domestic markets or overseas when exporting. One example is breastmilk substitutes. There is an International Code of Marketing of Breastmilk Substitutes designed to tackle the irresponsible marketing of breastmilk substitutes which can be damaging to the health of young children (Fanzo et al 2018). In addition, research in Asia shows that when multinational food and beverage manufacturers enter developing markets, they often invest in ultra-processed foods which contain high levels of fat, salt and sugars such as soft drinks and snack foods (Baker and Friel 2016). And while supermarkets can bring greater availability of safer and more diverse foods, they also contribute to the increased consumption of ultra-processed foods.

The private sector plays a key role in improving food safety in response to public and market demands.

Case study: Improving access to affordable sources of protein

With its monthly supply of 18 million table eggs, 800,000 day-old chicks and extensive distribution network, KEL Foods is providing a much-needed source of affordable protein for Malawi's population. The average Malawian currently eats only 1.1 kilograms of eggs per year compared with 6.6 kg for South Africans and 15.6 kilograms in the United States (FAO 2017).

We invested in KEL Foods in 2017 to help improve access to, and increase the supply of, naturally nutritious food for domestic and regional markets. The majority of KEL Foods' production is distributed through its national retail network in Malawi. The company also produces, distributes and sells animal feed.

Our investment has supported the company's growth strategy. KEL Foods currently employs over 1,000 people – 18 per cent of them women – as well as providing training for small-scale farmers in poultry management. The investment is expected to stimulate the local economy and KEL Foods sources all its maize and soya locally.

We are working with KEL Foods to develop and implement a comprehensive health, safety and environmental management system, including working towards international standards.

03

Environmental sustainability

3.1 Development challenge

The F&A sector relies on natural ecosystems more than any other sector but is at the same time a major driver of climate change and environmental degradation. For instance, agriculture is responsible for 70 per cent of freshwater use, takes up almost half of the world's habitable land worldwide and produces approximately 24 per cent of global greenhouse gas emissions. Moving to a sustainable food system by 2050 is essential for sustainable development and will require major changes in the way we produce and consume food (Lipper et al 2017).

The regions where we invest – Africa and South Asia – are already and will continue to feel the impact of climate change disproportionately because of relatively large agricultural sectors and reliance on rain-fed agriculture, whilst their per capita contribution has been relatively low. Farmers increasingly have to deal with the physical climate risks associated with a changing climate, such as drought, floods and storms. There is widespread consensus that climate change will reduce global crop yields, affecting between 35 million people and 1.8 billion people if temperatures rise by 1.5°C and 3°C, respectively (IPCC 2018). For more detail regarding CDC's climate strategy, please see here.

Meanwhile, there is strong evidence that biodiversity is increasingly under threat (FAO 2019c). Biodiversity is indispensable for food security, sustainable development and many important ecosystem services on which food systems depend.

3.2 Key insights

Climate mitigation, adaptation and resiliency strategies are needed in the F&A sector to respond to climate change and secure future sustainable development

Climate adaptation involves adjusting to climate change and its effects – through reducing the reliance on rain-fed agriculture and introducing drought-resistant seeds, for example. *Climate mitigation* is about reducing or avoiding emissions to limit future temperature rises. Climate-resilient pathways are development trajectories that combine adaptation and mitigation in a complementary way. Whilst there is a lot of evidence on the current status of climate change and associated risks, there is less evidence on the effects of specific climate resilience interventions, particularly socio-economic effects on farmers or companies (Denton et al 2014).

1.8 billion people

There is widespread consensus that climate change will reduce global crop yields, exposing between 35 million people and 1.8 billion people if temperatures rise by 1.5°C and 3°C, respectively.

Different parts of the F&A value chain require different climate mitigation approaches - in developing countries these need to be balanced with other objectives described in previous sections

The agricultural stage is the most GHG-intensive stage of the value chain and different approaches need to be taken to reduce carbon dioxide, methane and nitrous oxide emissions. Technological mitigation approaches can help reduce emissions, optimising nutrient use, improving productivity, minimising waste, and reducing the carbon intensity of fuel inputs. Although these actions are necessary, they may be insufficient to bring overall emissions within environmental limits. Beyond the 'farm gate', value chain emissions can be brought down further through renewable energy deployment and resource efficiency, which can also bring business benefits. Using biomass-to-power or solar on site, for example, can often cut operational costs for businesses while improving the reliability of service if electricity supply from the national grid is unstable.

At the consumer level, a growing body of evidence suggests that if we are to achieve substantial reductions in food-related emissions, we must address not only how we produce and distribute food, but also what we eat. A dietary shift away from GHG-intensive foods such as meat and dairy products is particularly relevant for developed countries, but it could pose a nutritional challenge for developing countries where the intake of proteins is still low. For any given mitigation measure, decision makers need to consider the extent to which it moves us away from, or towards, a more resilient and healthy system of food production and consumption (Garnett 2014).

The private sector can contribute to climate adaptation through supporting or scaling up the most promising innovations

Dinesh et al (2017) have identified "10 best bet innovations for climate adaptation in agriculture", which can help to achieve food security under a changing climate, while also delivering co-benefits for environmental sustainability, nutrition and livelihoods. These are:

1. Sustainable agroforestry to diversify farms and enhance resilience
2. Sustainable aquaculture to enhance nutrition and diversify incomes
3. Stress-tolerant varieties to contribute to climate change adaptation
4. Improving smallholder dairy to enhance incomes and improve climate resilience
5. Alternate wetting and drying in rice systems
6. Solar-powered irrigation to expand access to affordable irrigation and enhance resilience
7. Digital agriculture ranging from tailored advice to shared value with millions of other farmers
8. Climate-informed advisories to enhance production and resilience
9. Weather index-based agricultural insurance for countries and farmers
10. Scaling up financing for climate change adaptation in agriculture

Food loss, especially at the early and middle stages of the food value chain, is a major issue in developing countries

Whilst in high-income countries food waste typically occurs at the consumer level, in low-income countries it is more prevalent in the early and middle stages of the food supply chain: during harvesting and post-harvest. Post-harvest losses, i.e. those that occur at the handling and storage stages of the value chain, account for roughly a fifth to a third of all food loss and waste in developing countries. At all stages of the value chain it can be a major contributor to methane emissions. Food loss and waste are however not solely environmental issues but also affect economic and food security outcomes.

What is 'climate-smart' agriculture?

Climate-smart agriculture is an approach to transform and reorient agricultural systems to effectively support development and ensure food security under climate change. It aims to tackle three main objectives (FAO, 2019):

1. Sustainably increasing agricultural productivity and incomes
2. Adapting and building resilience to climate change
3. Reducing and/or removing greenhouse gas emissions, where possible

The private sector can contribute to climate adaptation through supporting or scaling up the most promising innovations.

Food loss and waste are not solely environmental issues but also affect economic and food security outcomes.

Reducing food loss and waste offers a win-win opportunity for companies while contributing to broader impact outcomes

The World Bank, FAO and others have shown that investment in reducing food loss can be cost effective and yield good returns for companies, especially when food commodity prices rise (Lipinski et al 2013). Investments and practices that reduce food loss can result in operational efficiencies and deliver positive financial paybacks for companies, according to research into more than 1,000 food-based businesses across 17 countries (Hanson and Mitchell 2017). Successful strategies include better matching of forecasts of supply and demand between manufacturers and retailers, improved manufacturing processes, reprocessing food that does not meet the cosmetic specifications, changes in food packaging and labelling, stock reduction and increased product shelf life, improving supply chain management, and improving post-harvest storage and handling throughout the supply chain.

Food loss and waste remains an under-researched topic

An FAO study (2011) revealed that there are major data gaps in the knowledge of global food loss and waste. Despite these significant numbers, only 5 per cent of agricultural research worldwide focuses reducing post-harvest losses while 95 per cent focuses on increasing crop production. Impact investors can also contribute to closing the evidence gap by sharing lessons from investments and practices that successfully reduce food losses in developing countries. As part of CDC's online ESG toolkit, we have developed a Waste Guidance Note, including for the agribusiness sector.

What is the difference between food loss and food waste?

Food loss refers to the decrease in edible food that takes place at production, post-harvest and processing stages in the food supply chain. *Food waste* occurs at the end of the food chain and relates to retailer and consumer behaviour (Parfitt et al, 2010).

Case study: Supporting climate action and a 'just transition' in West Africa

Growing demand for wood products in Africa has led to increasing rates of deforestation over the past decade. Miro Forestry is a sustainable forestry company with plantations in Sierra Leone and Ghana. The company is expanding its plantations to 30,000 hectares to meet the growing demand for timber in the region. The company employs approximately 2,000 workers directly, a number which is expected to double over the coming years, mostly in rural areas where there are few alternative formal employment opportunities.

The company contributes to climate mitigation by removing carbon through tree planting and providing a sustainable source of local timber. At least 10 per cent of the land it manages is kept under permanent conservation.

We first invested in Miro in 2015, supporting the recovery of Sierra Leone's economy following the Ebola outbreak, and have subsequently made follow-on investments to help fund the company's long-term business plan. We've also worked with the Miro team to develop a gender action plan to improve the representation, mobility and job quality of women in the workforce.

04

Trade-offs and risks to impact

Finally, any F&A investment will be part of a wider inter-linked, dynamic and interactive system and cannot be viewed in isolation. It can create positive impacts in some areas, and zero – or even negative – impact in others. It is important to identify and weigh up the potential trade-offs and impact risks to analyse the net effect on the wider food and agricultural system and develop risk mitigation strategies where possible, including through working with investees towards international environmental, social and governance standards.

In each of our three impact areas – economic opportunities, food security and nutrition and environmental sustainability – trade-offs and interactions can arise both between and within them. Here are some examples:

Interactions between different impact areas could for instance include:

- *Economic vs nutritional outcomes:* Some food items can have a negative impact on nutrition and health outcomes, but at the same time create economic opportunities throughout the value chain. An example is tobacco production which, though detrimental to health for overseas consumers, provides livelihoods for many smallholders in a country like Malawi.
- *Environmental vs nutritional outcomes:* All four elements of nutrition and food security – availability, access, utilisation and stability – will likely be impacted by climate change through its predicted effect on agricultural production, food prices and markets and other parts of the food system (IPCC 2014). There has been research into how to assess trade-offs by geography and food type – such as the EAT Lancet reference diet which limits resource-intensive foods (Willett et al 2019). Climate change is also expected to bring new forces into play by increasing foodborne diseases. Rising air temperatures could lead to an increase in infections from bacteria in food (Grace 2015).

Any F&A investment will be part of a wider inter-linked, dynamic and interactive system and cannot be viewed in isolation.

Trade-offs can also arise *within* impact areas, often arising from interactions between the scale and depth of impact. For example:

- *Economic opportunities – job creation:* Investments in primary agriculture and food processing can support more employment in the short run, but these investments may not contribute as much to long-term structural economic transformation compared with other sectors of the economy (ODI 2013).
- *Economic opportunities – supplier income:* Outgrower schemes can have potential for income improvements with a limited group of farmers. It's less clear how to achieve income improvements for larger groups of smallholder farmers as described earlier in this report. This can sometimes create a trade-off between depth and scale, i.e. supporting a few farmers with deeper income improvements or many farmers with smaller improvements.
- *Environmental sustainability - climate adaptation and mitigation:* Climate adaptation and mitigation can generate co-benefits but can sometimes also introduce trade-offs. With rising temperatures, farmers are likely to need more irrigation and cooling – such as food refrigeration. This will however lead to higher demand for energy and scarce natural resources, which shows the interactive link between climate change responses and sustainable development strategies.

Trade-offs can also arise within impact areas, often arising from interactions between the scale and depth of impact.

References

African Development Bank (2016). Feed Africa: Strategy for Agricultural Transformation in Africa 2016-2025. Retrieved from: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Feed_Africa-Strategy-En.pdf

Almfraji, M. A., & Almsafir, M. K. (2014). Foreign Direct Investment and Economic Growth Literature Review from 1994 to 2012. *Procedia - Social and Behavioral Sciences*, 129, 206-213.

Asfaw, S., McCarthy, N., Lipper, L., Arslan, A., & Cattaneo, A. (2016). What Determines Farmers' Adaptive Capacity? Empirical Evidence from Malawi. *Food Security*, 8(3), 643-664.

Ashraf, N., Giné, X and Karlan, D. (2009). Finding Missing Markets (And a Disturbing Epilogue): Evidence from an Export Crop Adoption and Marketing Intervention in Kenya. *American Journal of Agricultural Economics.* Vol. 91, No. 4 (Nov 2009), pp. 973-990

Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2018). Financing SMEs and Economic Development - chapter 18 in the T. Beck (ed), *Handbook of Finance and Development*, pp. 503-571.

Baker, P., & Friel, S. (2016). Food Systems Transformations, Ultra-Processed Food Markets and the Nutrition Transition in Asia. *Globalization and Health*, 12(1), 80.

Beck, T., & Demirguc-Kunt, A. (2006). Small and Medium-Size Enterprises: Access to Finance As a Growth Constraint. *Journal of Banking & Finance*, 30(11), 2931-2943.

Beddington, J. R., Asaduzzaman, M., Clark, M,E, Fernández Bremauntz, A., Guillou, M.D., Howlett, D.J.B., Jahn, M.M., Lin, E., Mamo, T., Negra, C., Nobre, C.A., Scholes, R.J., Van Bo, N. & Wakhungu, J. (2012). What next for agriculture after Durban? *Science*, 335.

Behrens, P., Kiefte-de Jong, J. C., Bosker, T., Rodrigues, J. F., De Koning, A., & Tukker, A. (2017). Evaluating the environmental impacts of dietary recommendations. *Proceedings of the NationalAcademy of Sciences*, 114(51), 13412-13417.

Berbés-Blázquez, M., Mitchell, C. L., Burch, S. L., & Wandel, J. (2017). Understanding climate change and resilience: assessing strengths and opportunities for adaptation in the Global South. *Climatic Change*, 141(2), 227-241.

Berenschot (2012). *Living wage in international supply chains - an inventory report.* Report commissioned by the Netherlands' Ministry of Foreign Affairs.

Calicioglu, O., Flammini, A., Bracco, S., Bellù, L., & Sims, R. (2019). The Future Challenges of Food and Agriculture: An Integrated Analysis of Trends and Solutions. *Sustainability*, 11(1), 222.

CSR-Asia (2017). Agri-business in ASEAN: making the case for smallholder inclusion - an analysis of 10 agricultural private sector actors who have adopted responsible and inclusive approaches to smallholder producers. Report co-published with Oxfam and Swedish Development Cooperation. Retrieved from: http://www.csrasia.com/report/GRAISEA_Smallholder_Case_Studies_2017.pdf

Dalberg, & Wageningen Centre for Development Innovation (2018). What works to increase smallholder farmers' income? A landscape review.

Development Initiatives, 2018 2018 Global Nutrition Report: Shining a light to spur action on nutrition. Bristol, UK: Development Initiatives.

Donor Committee for Enterprise Development (2017). Special Feature: Recent Research on Women's Economic Empowerment. DCED Latest Research & Evidence on PSD.

De Brauw, A., Brouwer, I. D., Snoek, H., Vignola, R., Melesse, M. B., Lochetti, G., Wagenburg, C. Lundy, M., Maitre d'Hotel, E., Ruben, R. (2019). Food system innovations for healthier diets in low and middle-income countries (Vol. 1816): IFPRI Discussion Paper.

Del Carpio, X., & Maredia, M. (2011). Impact evaluations in agriculture: An assessment of the evidence. World Bank, Washington, DC.

Denton, F. et al. (2014). Climate-Resilient Pathways: Adaptation, Mitigation, and Sustainable Development. *Climate Change*, 1101-1131. Retrieved from: https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap20_FINAL.pdf

DFID (2014). Agriculture and Growth Evidence Paper Series.

DFID (2015). DFID's Conceptual Framework on Agriculture. Retrieved from: https://www.gov.uk/government/publications/dfids-conceptual-framework-on-agriculture

Dinesh, D., Campbell, B. M., Bonilla-Findji, O., & Richards, M. (2017). 10 Best Bet Innovations for Adaptation in Agriculture: A Supplement to the UNFCCC NAP Technical Guidelines.

Dorward, A. (2009). Integrating contested aspirations, processes and policy: development as hanging in, stepping up and stepping out. *Development Policy Review*, 27(2), 131-146.

Edmunds D, Sasser J, Wollenberg E. (2013). *A gender strategy for pro-poor climate change mitigation*. CCAFS Working Paper no. 36. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Food and Agriculture Organization (2008). An introduction to the basic concepts of food security. Retrieved from Rome, Italy:

Food and Agriculture Organization (2010). "Climate-smart" agriculture: policies, practices and financing for food security, adaptation and mitigation.

Food and Agriculture Organization (2011). Energy-smart food for people and climate. Rome.

Food and Agriculture Organization (2013a). Climate-Smart Agriculture. Sourcebook.

Food and Agriculture Organization (2013b). Food wastage footprint; impacts on natural resources. Summary Report. Rome.

Food and Agriculture Organization (2014). Nutrition-Sensitive Agriculture. Paper presented at the Second International Conference on Nutrition, Rome, Italy. http://www.fao.org/3/a-as601e.pdf

Food and Agriculture Organization (2018). Food loss and waste and the right to adequate food: making the connection. Rome. 48 pp.

Food and Agriculture Organization (2019a). The Climate Smart Agriculture Sourcebook. Retrieved from: http://www.fao.org/climate-smart-agriculture-sourcebook/en/

Food and Agriculture Organization (2019b). The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction. Rome.

Food and Agriculture Organization (2019c). The State of the World's Biodiversity for Food and Agriculture, J. Bélanger & D. Pilling (eds.). FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome. 572 pp. Retrieved from: http://www.fao.org/3/CA3129EN/CA3129EN.pdf

Farmer Income Lab (2018). What Works to Increase Smallholder Farmer's Income? A landscape review.

Flanagan, K., Clowes, A., Lipinski, B.,Goodwin, L., & Swannell, R. (2018). SDG Target 12.3 on food loss and waste: 2018 progress report. Washington, DC: Champions, 12.

Foresight (2011). The future of food and farming: challenges and choices for global sustainability. Final Project Report. London, The Government Office for Science.

Garnett, T. (2011). Where are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? *Food Policy*, 36, S23-S32.

Global Food Safety Partnership (2019). Food safety in Africa: Past endeavors and future directions. Washington, D.C.: World Bank.

Giller, K. E., Witter, E., Corbeels, M., & Tittonell, P. (2009). Conservation agriculture and smallholder farming in Africa: the heretics' view. *Field Crops Research*, 114(1), 23-34.

Global Alliance for Climate-Smart Agriculture (2014). Framework Document. GACSA Series, Document 1 (GACSA1).

Global Alliance for Improved Nutrition GAIN's Principles for Engagement. Retrieved from http://www.gainhealth.org/wp-content/uploads/2018/07/GAIN-principles-of-engagement.pdf

Global Panel on Agriculture and Food Systems for Nutrition (2018). Preventing nutrient loss and waste across the food system: Policy actions for high-quality diets. Policy Brief No. 12. London, UK: Global Panel on Agriculture and Food Systems for Nutrition.

Gneiting, U., & Sonenshine, J. (2018). A living income for small-scale farmers – tackling unequal risks and market power. Oxfam Discussion Paper. Oxford: Oxfam. Retrieved from: https://www.oxfam.org/en/research/living-income-small-scale-farmers

Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., Pretty, J., Robinson, S., Thomas, S.M., Toulmin, C. (2010). Food Security: The Challenge of Feeding 9 Billion People. *Science*, Vol. 327 (5967), pp. 812-818.

Gollin, D. (2019). IFAD Research Series 34 - Farm size and productivity: Lessons from recent literature. IFAD Research Series 281567. International Fund for Agricultural Development (IFAD).

Grace, D. (2015). Food Safety in Low and Middle Income Countries. *International Journal of Environmental Research and Public Health*, 12(9), 10490-10507.

Grindatto, G. M., McArdle, J. & Voitzwinkler, F. (2018). Ending malnutrition: what role for the private sector? From prevention to treatment. 27.

Gromko D, Abdurasalova G. (2018). Climate change mitigation and food loss and waste reduction: Exploring the business case. CCAFS Working Paper no. 246. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Gustavsson, J., Cederberg, C., Sonesson, U., Van Otterdijk, R., & Meybeck, A. (2011). Global food losses and food waste: Extent, causes and prevention. FAO Rome.

Haggblade, S., Theriault, V., Staatz, J., Dembele, N., & Diallo, B. (2012). A conceptual framework for promoting inclusive agricultural value chains. International Fund for Agricultural Development (IFAD), mimeo (online document).

Hanson, C., & Mitchell, P. (2017). The Business Case for Reducing Food Loss and Waste. Champions 123, 1-24.

Hawkes, C. (2008). Dietary implications of supermarket development: a global perspective. *Development Policy Review*, 26(6), 657-692.

He, P., Baiocchi, G., Hubacek, K., Feng, K., & Yu, Y. (2018). The environmental impacts of rapidly changing diets and their nutritional quality in China. *Nature Sustainability*, 1(3), 122.

Herforth, A. (2012). Guiding principles for linking agriculture and nutrition: synthesis from 10 development institutions. Report for the Food and Agriculture Organization of the United Nations. Rome, Italy: FAO.

Herforth, A., & Ahmed, S. (2015). The food environment, its effects on dietary consumption, and potential for measurement within agriculture-nutrition interventions. *Food Security*, 7(3), 505-520.

Herforth, Anna, and Jody Harris. 2014. Understanding and Applying Primary Pathways and Principles. Brief #1. Improving Nutrition through Agriculture Technical Brief Series. Arlington, VA: USAID/Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project.

High Level Panel of Experts on Food Security and Nutrition (2012). Food security and climate change. A report by the HLPE on Food Security and Nutrition of the Committee on World Food Security, Rome.

High Level Panel of Experts on Food Security and Nutrition (2017). Nutrition and Food Systems. A report by the High Level Panel of Experts on Food security and Nutrition of the Committee on World Food security, Rome., 152.

IDH (2016). Service Delivery Models - insights for continuous improvement and farm impact.

Ingram, J. (2018). To address the triple burden of malnutrition, focus on food systems and demand. Retrieved from http://www.ifpri.org/blog/address-triple-burden-malnutrition-focus-food-systemsand-demand

Intergovernmental Panel on Climate Change (2018). Special Report on Global Warming of 1.5C. Retrieved from: https://www.ipcc.ch/sr15/

Intergovernmental Panel on Climate Change (2014): AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Retrieved from: https://www.ipcc.ch/report/ar5/wg2/

Intergovernmental Panel on Climate Change (2019). Refinement to the 2006 IPCC guidelines for National greenhouse gas inventories.

Jenkins, M., Byker Shanks, C., & Houghtaling, B. (2015). Orange-fleshed sweet potato: Successes and remaining challenges of the introduction of a nutritionally superior staple crop in Mozambique. *Food and Nutrition Bulletin*, 36(3), 327-353.

Krishna, I. M., Manickam, V., Shah, A., & Davergave, N. (2017). Environmental management: science and engineering for industry: Butterworth-Heinemann.

Lee, J., Martin, A., Kristjanson, P., & Wollenberg, E. (2015). Implications on equity in agricultural carbon market projects: a gendered analysis of access, decision making, and outcomes. *Environment and Planning A: Economy and Space*, 47(10), 2080-2096.

Lipinski, B., Hanson, C., Lomax, J., Kitinoja, L., Waite, R., & Searchinger, T. (2013). Reducing food loss and waste. World Resources Institute Working Paper, 1-40.

Lipper, L., McCarthy, N., Zilberman, D., Asfaw, S., & Branca, G. (2017). Climate Smart Agriculture: Building Resilience to Climate Change (Vol. 52): Springer.

Lipper, L., Thornton, P., Campbell, B. et al. (2014). Climate-smart agriculture for food security. *Nature Climate Change* 4, 1068–1072 (2014). https://doi.org/10.1038/nclimate2437

Malabo Montpellier Panel (2017). Nourished: How Africa can build a future free from hunger and malnutrition. Dakar: Malabo Montpellier Panel.

McArthur, J. W., & McCord, G. C. (2017). Fertilizing growth: Agricultural inputs and their effects in economic development. *Journal of Development Economics*, 127, 133-152.

MQSUN+ (2018). Where Business and Nutrition Meet: Review of approaches and evidence on private sector engagement in nutrition. MQSUN+ report. Retrieved from: https://mqsunplus.path.org/wp-content/uploads/2018/09/MQSUN_Report-Where-Business-and-Nutrition-Meet_15June2018_FINAL.pdf

Nguz, K. (2007). Assessing food safety system in sub-Saharan countries: An overview of key issues. *Food Control*, 18(2), 131-134.

Overseas Development Institute (2013). The role of development finance institutions in promoting jobs and structural transformation: a quantitative assessment. ODI Working Paper 377. Retrieved from: https://www.odi.org/publications/7369-role-development-finance-institutions-promoting-jobs-andstructural-transformation-quantitative

Parfitt, J., Barthel, M., & Macnaughton, S. (2010). Food waste within food supply chains: quantification and potential for change to 2050. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1554), 3065-3081.

Quinney M, Bonilla-Findji O, Jarvis A. (2016). CSA Programming and Indicator Tool: 3 Steps for increasing programming effectiveness and outcome tracking of CSA interventions. CCAFS Tool Beta version. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Rosegrant, M. W., Koo, J., Cenacchi, N., Ringler, C., Robertson, R. D., Fisher, M., Cox, C. M., Garrett, K., Perez, N. D., and Sabbagh, P. (2014). Food security in a world of natural resource scarcity: The role of agricultural technologies. Washington, D.C.: International Food Policy Research Institute (IFPRI). http://dx.doi.org/10.2499/9780896298477

Rosenstock, T. S., Nowak, A., & Girvetz, E. (2018). The Climate-Smart Agriculture Papers: Investigating the Business of a Productive, Resilient and Low Emission Future: Springer.

Ruel, M. T., Quisumbing, A. R., & Balagamwala, M. (2018). Nutrition-sensitive agriculture: What have we learned so far? *Global Food Security*, 17, 128-153.

Searchinger, T., Waite, R., Hanson, C., Ranganathan, J., Dumas, P., & Matthews, E. (2018). Creating a Sustainable Food Future: A Menu of Solutions to Feed Nearly 10 Billion People by 2050. World Resource Institute: Washington, DC, USA.

Sheahan, M., & Barrett, C. B. (2017). Food loss and waste in Sub-Saharan Africa. *Food Policy*, 70, 1-12.

Snilstveit, B., Stevenson, J., Fenton Villar, P., Eyers, J., Harvey, C., Panfil, S., Puri, J. and McKinnon, M.C. (2016). Land-use change and forestry programmes: evidence on the effects on greenhouse gas emissions and food security. 3ie Evidence Gap Map Report 3.

Sova, C. A., G. Grosjean, T. Baedeker, T. N. Nguyen, M. Wallner, A. Jarvis, A. Nowak, C. Corner-Dolloff, E. Girvetz, P. Laderach, and Lizarazo. M. (2018). Bringing the Concept of Climate-Smart Agriculture to Life: Insights from CSA Country Profiles Across Africa, Asia, and Latin America. World Bank, and the International Centre for Tropical Agriculture, Washington, DC.

Stevenson, J. R. & Vlek, P. (2018). *Assessing the Adoption and Diffusion of Natural Resource Management Practices: Synthesis of a New Set of Empirical Studies*. Rome: Independent Science and Partnership Council (ISPC).

Swinburn B.A., Kraak V.I., Allender S., Atkins V.J. et al. (2019) The Global Syndemic of Obesity, Undernutrition, and Climate Change: The Lancet Commission report. *Lancet*. 2019 Feb 23;393(10173):791-846.

Timmermans, A. J. M., Ambuko, J., Belik, W., & Huang, J. (2014). Food losses and waste in the context of sustainable food systems. Retrieved from: http://edepot.wur.nl/309118

Ton, G., Desiere, S., Vellema, W., Weituschat, S., & D'Haese, M. (2017). The effectiveness of contract farming in improving smallholder income and food security in low- and middle-income countries – a mixed method systematic review. 3ie Systematic Review 38, London: 3ie International Initiative for Impact Evaluation. Retrieved from: https://www.3ieimpact.org/sites/default/files/2019-01/sr38-contract-farming.pdf

Townsend, R. F., Jaffee, S., Hoberg, Y. T.; Htenas, A. (2016). *Future of Food: Shaping the Global Food System to Deliver Improved Nutrition and Health.* World Bank, Washington, DC.

Townsend, R.; Benfica, R. M.; Prasann, A.; Lee, M. (2017). *Future of Food: Shaping the Food System to Deliver Jobs.* World Bank, Washington, DC.

Vermeulen, S. J., Campbell, B. M., & Ingram, J. S. (2012). Climate Change and Food Systems. *Annual Review of Environment and Resources*. Vol. 37, 195-222.

Willett W. et al. (2019). Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. Lancet. 393(10170):447-492. doi: 10.1016/S0140-6736(18)31788-4.

World Bank (2011). Impact Evaluations in Agriculture: An Assessment of the Evidence. Washington DC: International Evaluations Group.

World Bank (2015). Ending Poverty and Hunger by 2030: An Agenda for the Global Food System. Washington, DC

World Bank (2019). 'Creating Markets' to Leverage the Private Sector for Sustainable Development and Growth – an evaluation of the World Bank Group's experience through 16 case studies. Washington DC: *Independent Evaluation Group.*

World Health Organisation (2017). Food safety. Retrieved from https://www.who.int/news-room/factsheets/detail/food-safety

World Health Organization (2006). Guidelines on food fortification with micronutrients.

World Health Organisation (2020). Obesity and overweight. Retrieved from https://www.who.int/newsroom/fact-sheets/detail/obesity-and-overweight

World Resources Institute (2018). Creating a Sustainable Food Future: A Menu of Solutions to Feed Nearly 10 Billion People by 2050.

Zorya, S., Morgan, N., Diaz Rios, L., Hodges, R., Bennett, B., Stathers, T., Mwebaze, P. Lamb, J. (2011). Missing food: the case of postharvest grain losses in sub-Saharan Africa. Technical Report. The International Bank for Reconstruction and Development / The World Bank, Washington DC, USA.

Other reports in CDC's Insight series:

What we've learnt about the affordability of food: evidence from Zambia

How does an online supermarket in India impact farmers?

What's the impact of sustainable farming on smallholder suppliers in Ethiopia?

What's the impact of modern rice farming in Nigeria?

How can our investments make a difference to people living in poverty?

What is the impact of investing in financial systems?

What is the impact of investing in connectivity?

What is the impact of investing in power?

What's the impact of online higher education in Africa?

To view the rest of our Insight series visit:

cdcgroup.com/insight

For further information:

- **CDC Group:**
  Nabeela Khan
  nkhan@cdcgroup.com
  cdcgroup.com/insight

CDC
Investment works

WAGENINGEN
UNIVERSITY & RESEARCH