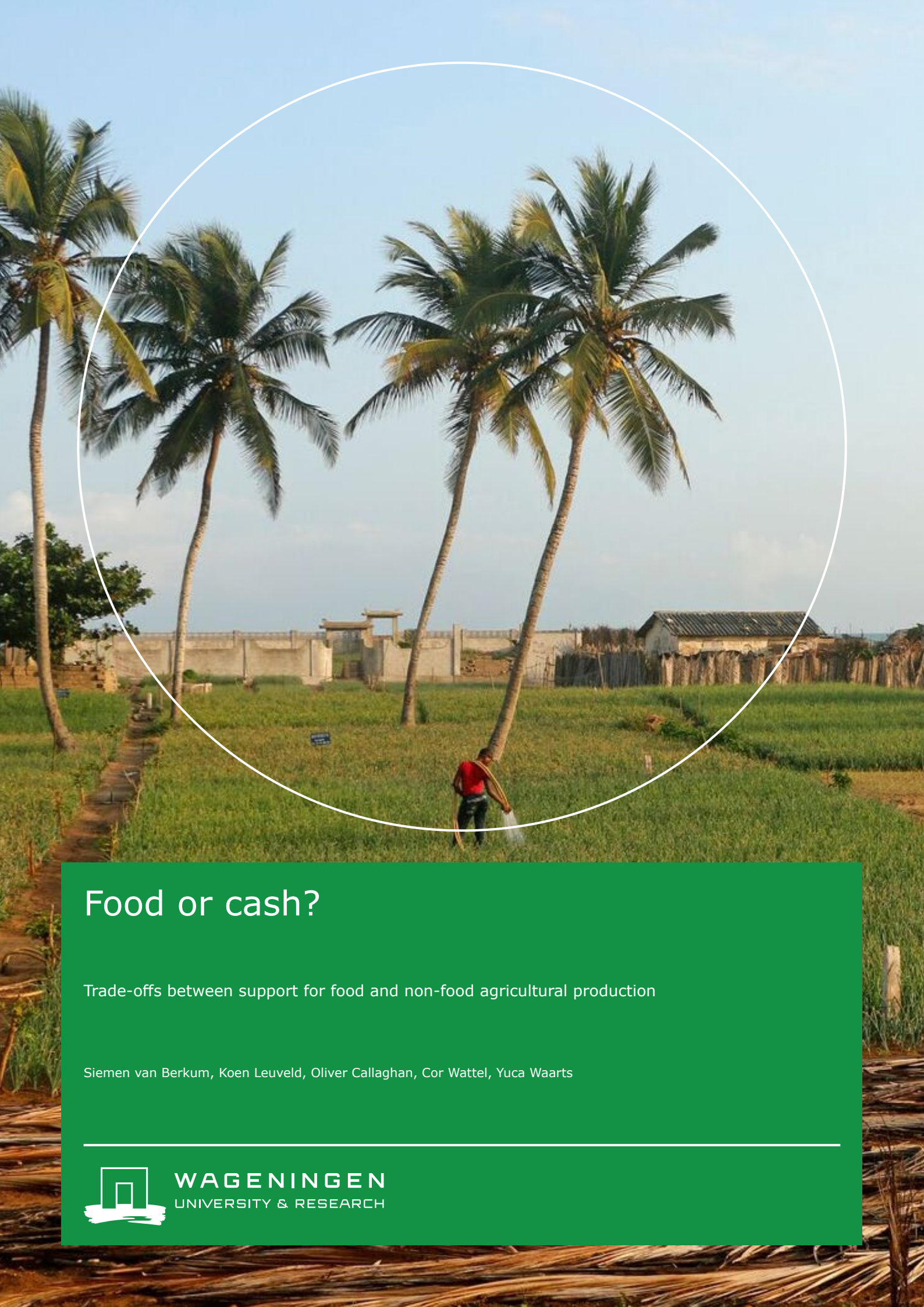

Food or cash?

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Disclaimer: The findings, interpretations, and conclusions expressed in this report are entirely those of the authors. They do not necessarily represent the views of ADA or its affiliated organisations.

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Trade-offs occur between food and cash crop production in terms of food security, social and environmental impacts, but synergies are also possible. Cash crop production for agricultural income generation can have a positive impact on food security, especially when done together with food crop production, because it combines two dimensions of food security: food availability and food accessibility. Environmental damage can be reduced by integrated and sustainable agricultural practices that can also achieve high yields. Smallholder farmers are greatly helped by financial, institutional and knowledge support for the implementation of sustainable agricultural practices that also allows them to reap economic benefits. The findings of this report are based on empirical evidence from literature review.

Key words: cash crops, food security, trade-offs, risk management, private investments, Africa

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Contents

Abbreviations and acronyms

ADA	Appui au développement autonome asbl
ESG standard	Environmental, social and governance standard
ICLS	integrated crop-livestock systems
IFPRI	International Food Policy Research Institute
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Organization Statistics
FIVI	Food Import Vulnerability Index
FNS	Food and Nutrition Security
GHI	Global Hunger Index
PES	Payment for Ecosystem Services
NGO	Non-Governmental Organisation
SME	Small and medium-sized enterprise
SSA	Sub-Saharan Africa
SSNUP	Smallholder Safety Net Upscaling Programme

Executive summary

This report presents the latest evidence and knowledge on the pros and cons of supporting food production versus non-edible/cash/export crops and livestock products. The study was commissioned by ADA Luxembourg. ADA envisaged using the findings from this research in discussions with relevant stakeholders of the Smallholder Safety Net Upscaling Programme (SSNUP), through which ADA supports impact investors in agricultural chains in low- and middle-income countries. The study validates and weighs the assumptions about possible trade-offs between focusing development support on food or on non-food agricultural value chains. The research questions are answered through a combination of literature review, data analyses and interviews with funding and development organisations.

Definition of cash crops
The term cash crops is used to differentiate marketed crops from those used for livestock feed or own household consumption. A differentiation of food crops with cash crops suggests that most food crops were considered not to be traded much through markets. In practice this differentiation does not hold; also, in developing countries parts of food crop production have been marketed, depending on the extent (small-scale) farmers produce a surplus for which they find demand. We distinguish two types of cash crops. First, crops that are exclusively grown for sale, which include crops that are non-food, such as cotton, coffee, cocoa or tea. Second, crops that are produced with a 'marketable surplus', which include food crops that may be consumed by the household or sold on markets, such as rice or maize, but also certain fruits and vegetables. Thus, cash crops may be placed on a continuum, from pure home consumption to pure cash crop.

Key features of agricultural production, consumption and trade
The African continent produces a wide variety of food and cash crops, depending on biophysical and climatic conditions and market and policy-driven factors. Yet many countries still rely heavily on just a few staple crops for national food security, which largely determines the total caloric intake of rural populations. Although different crops characterise agricultural production in different regions of Sub-Saharan Africa (SSA), maize is the dominant crop in many SSA countries and accounts for the largest share of the total harvested agricultural area. Patterns of agricultural production are linked to the food eaten in Africa; data on the intake (in calories per capita per day) of various staple foods show that on average, African citizens are increasingly eating rice, while crops such as millet and sorghum are declining in importance. The average African citizen is getting richer, which translates into a steady increase in the amount of protein eaten, particularly from animal sources, though this is a slow process.

Many African countries depend heavily on imports of wheat, rice and other food staples. Around 25% of the cereals consumed in the Sub-Saharan Africa are imported, and that percentage is rising slowly over time. The average share of imports in food consumed hide the variety among countries and food products, with some counties – such as Malawi or Tanzania – not importing much at all, and some – such as island nations, DRC Congo, Gabon and Somalia – importing well over 50% of their cereals.

Leading causes of food insecurity: too little domestic food production?
SSA is the region of the world with the highest per capita rate of food insecurity and undernourishment, and has, on aggregate, a trade deficit in major food items that is expected to deepen. Reasons for domestic production falling short of domestic needs are context specific and multifaceted. The potential for increasing domestic production, for instance by agricultural intensification (i.e., increasing yields per hectare) is generally low due to small-scale farming structures dominating the region. Some SSA countries, however, are also net-exporter of foods, stressing the need for disaggregation of the region and a more context-specific approach to evaluating whether food security can be best enhanced by focusing on increasing domestic food production or by relying on international trade.

The relationship between food security and domestic food production is complex. A cross-sectional data analysis shows that countries with higher food production (per capita) have lower incidence of food insecurity. A logical conclusion would be that dedicating more resources to the production of food and less to the production of non-food agricultural commodities would thus lead to a lower incidence of food insecurity. However, the data analysis also indicates that countries with a higher ratio of production of non-food products to food products are not necessarily more food insecure, and vice versa.

Next, from a time series analysis, we identify many situations where national food security declines and these appear to be correlated with declines in domestic production. The data analysis does not indicate a clear relationship between specialisation in export crops and the incidence of declines in national food security. Nor do the data suggest that food loss is a major cause of food insecurity. Both the cross-sectional and time series analysis suggest that food (in)security is most likely driven by other additional factors other than availability of food products only. This is also confirmed by literature that points at (the combination of) a series of factors that are lead causes of food insecurity. Some of these factors affect the demand and access to food, for example high population growth, weak economic growth and gender inequality. Other factors affect production and availability of food, such as low productivity, low investment in agriculture and research, and climate change. Finally, there are factors that affect both supply and demand, such as poor policy frameworks and weak infrastructural development.

Cash crops and food security
Empirical evidence suggests a positive link between cash crop production and food security of the farmers involved but only if certain conditions are met. Examples from case studies in, among others, Ghana, Ethiopia and India indicate that growing cash crops for agricultural income generation can have a positive impact on food security especially when it is done alongside food crop production as it combines two dimensions of food security - food availability and food accessibility. Farmers are very aware of market risks and need buffers or collateral (e.g., guaranteed market sales and prices) to take up or expand cash crop production. It appears, for instance, that farmers with assets (e.g., land and/or livestock) and alternative income sources are more likely to invest in cash crops. Spreading market and income risks is a major reason for smallholder farmers to remain in mixed farming systems, combining crops and livestock for subsistence and markets.

Cases from the literature show that impacts of cash crop production on farmers' livelihoods depend on the characteristics of the farming households, their communities and the way in which cash crop production and marketing is supported, either by governments or by buyers (chain parties). Cash crop production can contribute positively to livelihoods and food security, but that requires the provision of technical training in addition to (institutional) support to smallholders for improving their access to markets and improved seeds, credit and other inputs.

Cash crops and socioeconomic impacts
Cases show evidence of unequal distribution of gains in both export-oriented and domestic value chains. This is especially the case if these chains are dominated by one or a few traders/exporters and processors. Moreover, if exporters are dominating the market, farmers will not or hardly benefit from rising/higher international prices. Seen through a regional lens, cash crop booms can have significant landscape and social impacts, leading to skewed income developments (concentration of wealth) and, if cash crop prices fall short, to debts for socially vulnerable farmers.

Cash crops and environmental impacts
The production of cash/export crops like soy, palm oil or cocoa are generally associated with negative impacts on the environment. Empirical evidence on the application of integrated crop-livestock systems (ICLS) indicates there are also major environmental benefits to be gained with such a mixed system through, e.g., the circular use of crop residues and manure on the farm. Other studies (some theoretically, others empirically underpinned) show that applying sustainable management practices do not have to result in low yields. Such win-win outcomes of maintaining yields while reducing environmental damages are based on the application of best management practices, including minimising chemical input use and maintaining soil organic matter through the application of crop residues. These results highlight the importance of designing effective training modalities and policies that enable knowledge to be put into practice, which includes

creating marketing opportunities, providing targeted and regular advisory services and region-wide measures to sustainably build and maintain soil fertility.

Spillover effects between cash and food production
Studies emphasise the complementarities of mixed farming systems, in which food crops are grown alongside cash crops: growing food crops directly contributes to food availability to the farmers' households and the marketing of cash crops generates income that improves access to food that is not or insufficiently produced at the own farm. Next, cash crop cultivation can go hand in hand with increased production and marketing of food crops, because the latter also make use of infrastructural and institutional (i.e., market and chain organisation) developments that cash crop cultivation triggers. Moreover, by becoming part of structured marketing chains, farmers gain access to better seeds, inputs, more technical (farm management) knowledge, and perhaps also access to markets for the sale of food crops.

Future food demand and requirements for future production to meet this demand
Urbanisation with associated changes in lifestyle, in combination with increasing welfare, change food consumption patterns towards more demand for animal protein and processed products. At the same time there is an urgent need to increase the supply of nutritious food and to reduce its costs and prices to consumers to address micronutrient deficiencies, undernutrition and obesity in SSA. Nutritious food investments – both on the supply and consumer demand side – should target sectors such as animal-source foods, pulses, nuts and seeds, vegetables, fruits, and fats and oils, in addition to the more dominant cereals. Support programmes to increase food production at the farm level will have to go hand in hand with investments in the food supply chain (midstream) to make nutrition-rich products more available and accessible in both rural and urban areas.

Are private investors most focused on cash products and public sector investment in food production?
International support and especially impact investments often go to cash and export crops, such as coffee, cocoa and palm oil, or to structured domestic value chains. Interviewees advocate for a more balanced attention to food crops, domestic markets, and rural households' food and nutrition security. This may require partnerships with more domestic actors who feel comfortable in these markets.

Recommendations
The findings of this report trigger a set of recommendations for the SSNUP design and implementation in order to mitigate the potential trade-offs between cash crop and food crop production, and to ensure that SNUPP's portfolio contributes positively to food and nutrition security.

a. A more *balanced attention* in SNUPP's project portfolio regarding food crops, domestic markets and food and nutrition security (FNS)
b. A *deliberate programme strategy* on FNS, laying out goals, strategies and a result framework for FNS
c. Rather than choosing between food and cash crops, consideration of a complex of variables that affect both the supply and demand of food in order to achieve effective FNS strategies in a certain country or local context
d. Focus investments on *diversifying crops and diets*, beyond the currently dominant cereals through *integrated interventions* in these value chains
e. Contribute to FNS by making investments in *food processing and local value addition*
f. Check programme interventions for *risks of negative spillovers on FNS* (environmental, social)
g. Stimulate food crops and domestic markets with *concessional capital funds or guarantees*, for example with certain *portfolio quota and corresponding bonuses*
h. Engage more in *partnerships with domestic actors* to develop domestic markets and strengthen resilience of local and national food systems.

Finally, the report suggests some ways to operationalise these recommendations in the projects funded by stakeholders collaborating in SSNUP.

1 Introduction

1.1 Background

Appui au développement autonome asbl (hereafter: ADA) commissions this study on 'trade-offs between supporting food and non-food agricultural production in Africa' in the framework of its Smallholder Safety Net Upscaling Programme (SSNUP), a ten-year programme aiming to increase smallholder farmers' livelihood and resilience in Africa, Latin America and Asia. The programme fulfils its ultimate objective by co-funding technical assistance (TA) projects implemented by Technical Assistance Facilities (TAF) of selected impact investment funds. The TA projects support agricultural value chain actors (agri-SMEs, cooperatives, and financial intermediaries) who are investees or potential investees of the impact investors. The projects are designed to foster the adoption of more responsible and sustainable business practices by the agricultural value chain actors and climate-resilient farming practices in line with agroecological principles by smallholder suppliers.

The programme's recent statistics show that almost a third of the organisations benefiting from SSNUP TA projects solely support non-food crops, while around 15% focus solely on food value chains. More than half of the organisations support both categories or do not have specific targets because many are financial intermediaries.

The programme stakeholders raise concerns about whether SSNUP should instead focus on supporting and catalysing private investment in local food value chains to better contribute to food security and sustainable agriculture. SSNUP acknowledges the conflicting opinions about whether to support non-food, export crops or, more broadly, cash crops versus staple and affordable, nutritious foods for domestic consumption that can address food insecurity.

1.2 Objective, research questions and approach

The objective of the study is to gather the latest evidence and knowledge on the pros and cons of supporting food production versus non-edible/cash/export crops and livestock products to inform the decision-making process of public and private actors to design projects/programmes supporting agricultural and rural development. To this aim, the study will provide evidence to validate and weigh the assumptions about the trade-offs between focusing future development support on food or non-food agricultural value chains.

Assumptions underlying the advantages and disadvantages of supporting food and non-food agricultural production, addressing the questions formulated in the Terms of Reference (ToR) of this study, will be examined through literature review, data collection, and interviews with funding and development organisations.[1] Table 1.1 presents the research questions and methods applied to answer them. The structure of the report will follow from this list of questions wherein Chapter 2 elaborates question 1 and 2, Chapter 3 answers question 3 and 4, and Chapter 4 reports on question 5 and 6. Question 7 and 8 are addressed in Chapter 5. Conclusions are drawn in Chapter 6.

[1] The research team would like to particularly thank the interviewees who provided their valuable insights and opinions and dedicated their precious time to the interviews.

Table 1.1 *Research Questions*

Questions as they are taken from the Terms of Reference of the study		Method (mainly but not exclusively)
1.	What are the main types of crop/livestock products produced, consumed, exported, imported, and stocked in national food reserves?	Data Analysis: • FAOSTAT: food balances
2.	What is the leading cause of food insecurity: insufficient food supply or inadequate food distribution and widespread food waste?	Data collection: • FAOSTAT Food Balances • Global Hunger Index/WDI Literature review and Interviews
3.	Were there situations when countries had difficulties filling their national food reserves due to drops in national production? Do those adverse situations happen more frequently than before?	Literature review and data collection from sources such as: • FAOSTAT Food Balances • FAOSTAT Production index (food only) Global Hunger Index/WDI
4.	Are those adverse situations more prevalent in regions/countries highly specialised in food production rather than in regions/countries highly specialised in non-edible/cash/export food production, and vice versa?	Literature review and data collection: FAOSTAT Production Index: Food/Non-food
5.	Does the production of non-edible/cash/export food lead to the depletion of natural resources, reduction of local food availability, food insecurity, biodiversity loss, reduction in resilience, overdependency on big agro-industry players, and decrease in livelihoods of smallholder farmers?	Literature review (including issues of value chain linkages) and Interviews
6.	Does non-edible/cash/export food production have spillover effects on other food production, contribute to food security, nutrition, biodiversity, farmers' resilience, and, more broadly, sustainable agriculture?	Literature review and Interviews
7.	What are the expected changes in future demand for food for a healthy diet and the requirements for future production to meet this demand at local, regional, and continental levels? This will shed light on the types of crops/livestock to support.	Literature review and Interviews
8.	Do public and private sectors investment strategies show that non-edible/cash/export food production or more structured value chains disproportionately attract attention from private investors whereas food production or unstructured value chains and food sovereignty are a public sector interest?	Interviews

A review of recently published literature about the trade-offs between food and non-food production was carried out. The literature search method consists of searching literature databases such as SCOPUS, ScienceDirect and Google Scholar using keywords, supplemented by a manual search (e.g., to include relevant working papers and reports we are aware of).[2] The information in the report from the literature includes both a brief narrative review, providing an overview of the literature, and a fully structured list of all the literature reviewed.

The aim of the data analysis is to provide evidence on the food security situation in selected African countries, and how this relates to the balance between food and non-food agricultural production. For this, we compiled and analysed secondary data on volume and value of production, consumption, import and export in value chains, as well as data on countries' latest food and nutrition security (FNS)[3] situation. For this, data sources were used that provide consistent and comparable data for all the countries covered.

Stakeholder perspectives were obtained from 10 organisations through a structured survey (see Appendix 2), and from an interview with six of those. The 10 organisations present a fair balance between the public sector, development investors and NGOs (see Appendix 3 for their profile), and provide a variety of perspectives. Some of the organisations usually partner with larger agri-food companies, whereas others are more involved with cooperatives, social organisations or local SMEs. A limitation is that they all represent international actors, rather than actors from Africa itself.

[2] The method for literature search is detailed in Appendix 1.

[3] The classical concept of Food Security involves four dimensions of food security: availability of food, access to food, utilisation of food, and the stability of these three. The nutrition aspect in FNS adds the aspects of care and health, and refers to 'an adequate nutritional status in terms of protein, energy, vitamins and minerals for all household members at all times' (Weingärtner 2004).

1.3 Scope of the study

The geographical scope of the study (country coverage) is on Africa, specifically the following sub-regions (following the World Bank country classification):[4]

- Central Africa: Angola, Burundi, Central African Republic, Chad, Congo Democratic Republic of, Congo Republic of, Rwanda
- Eastern Africa: Comoros, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Seychelles, Somalia, South Sudan, Sudan, Tanzania, Uganda
- Western Africa: Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Equatorial Guinee, Gabon, Gambia The, Ghana, Guinea, Guinee-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo.

Regarding product groups and related value chains, we follow FAO's classification of Product groups and subgroups:[5]

1. Cereals
2. Roots, tubers and plantains
3. Pulses, seeds, and nuts
4. Milk and eggs
5. Fish
6. Meat
7. Vegetables
8. Fruits
9. Fats and oils
10. Sweets and sugar
11. Beverages
12. Other

Next, we distinguish 'fibre crops' and 'other non-food agricultural products' to fully capture production, use and trade of non-food agricultural production. Non-food agricultural products are defined as products (from crops and livestock sectors) that have other functionalities than food, such as energy (biofuels), building and construction, fiber and pharmaceuticals. Other than this, we also distinguish between foods that are fundamental for human metabolism and foods that are 'not necessary', considering among others the food classification used for the Minimum Dietary Diversity Scores.[6]

1.4 Definition of food and cash crops[7]

Historically, the term cash crops is equated with plantation crops such as coffee, tea, cocoa, cotton and tobacco, oilseeds, sugar cane, oil palm, rubber and fruit. Cash crops have therefore been associated with export crops. Currently, the term cash crops is used to differentiate marketed crops from subsistence crops, which are those used for livestock feed or household consumption. A differentiation of food crops with cash crops suggests that most food crops were considered not to be traded much through markets. In practice this differentiation does not hold, particularly not in developed countries where almost all crops are grown for revenue. Also, in developing countries parts of food crop production have been marketed, depending on the extent (small-scale) farmers produce a surplus for which they find demand. There are many examples of trade in food staples (grains, pulses, and roots and tubers) between surplus and deficit areas, either within or between developing countries (see for instance, Okou et al., 2022).

Regardless of the type of cash crop or food crop, there are important differences in the degree of organisation of certain value chains and agricultural markets. A distinction can be made between more tightly structured value chains, with formal contracts between buyers and sellers and formal standards for

[4] see https://openknowledge.worldbank.org/pages/focus-sub-saharan-africa.
[5] FAO, see https://openknowledge.fao.org/server/api/core/bitstreams/836a65eb-1f12-4286-b62e-77ba4beedf16/content.
[6] See https://inddex.nutrition.tufts.edu/data4diets.
[7] This section draws heavily on Achterbosch et al. (2014).

product attributes (e.g., quality, weights, food safety), and looser value chains dominated by informal trade (Anderson et al., 2019).

In the World Bank's analysis of barriers to regional trade in food staples (World Bank 2012), 'staple food basket zones' are identified in Nigeria, Northern Zambia, Eastern Uganda, most of Tanzania and Northern Mozambique, from which surpluses of cereals are exported to deficit regions in periods of food stress. These examples show that the distinction between food crops and cash crops is not a strict dichotomy but rather a continuum as food crops can also be marketed.

We distinguish two types of cash crops. First, crops that are exclusively grown for sale, which include crops that are non-food, such as cotton, coffee, cocoa or tea. Second, crops that are produced with a 'marketable surplus', which include food crops that may be consumed by the household or sold on markets, such as rice or maize, but also certain fruits and vegetables. Thus, cash crops may be placed on a continuum, from pure home consumption to pure cash crop (Figure 1.1). Cash crops are sold on domestic markets and foreign markets. An export crop is a cash crop that is ultimately exported to foreign markets.

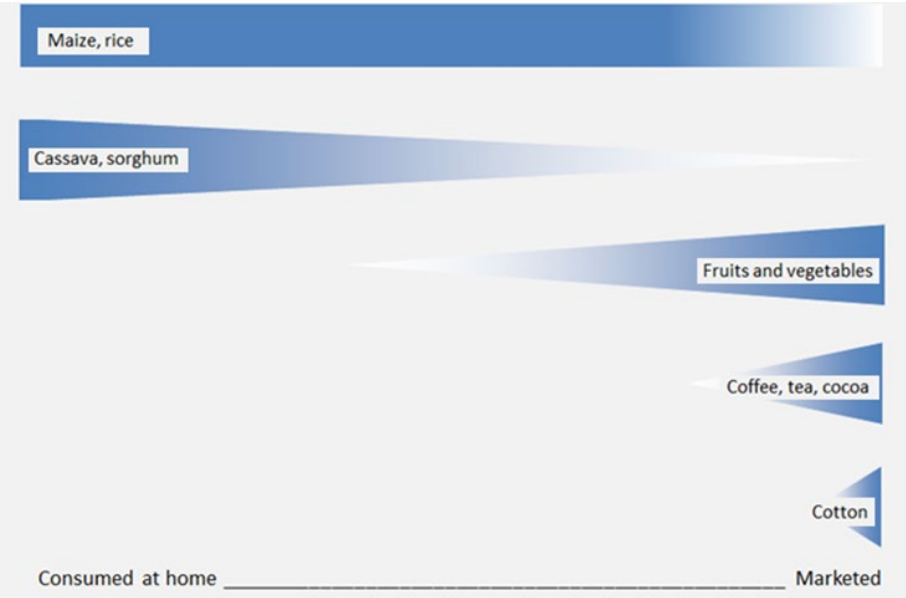

Figure 1.1 *Examples of agricultural products in a continuum of food crops and cash crops*

In this report we do consider livestock products, but we use the term cash crop exclusively as a synonym for livestock and crop production in the definition of 'an agricultural product grown or kept for direct sale rather than for subsistence food'. Arguably, the focus on distribution and marketing of farm output is a too narrow interpretation of cash crops. The wider context of cash cropping is a process of agricultural commercialisation, which implies a strengthened market orientation in farming and in many cases a movement away from extensive semi-subsistence farming to a more input-intensive farming system. Commercialisation will often be accompanied by a shift to high yielding seed varieties, irrigation and an increased use of fertilisers.

For the statistical analysis in this report, we maintain a simplified definition of cash crops, which includes all plantation crops - both for consumption and for use in manufacturing, bio-based chemicals or energy with the exception of wood products - and several tree crops that are sold on the market. In addition, we define basic food based on the FAO statistical handbook. Again, the definition is not very strict - see the continuum above - but it provides a classification of food and cash crops that can be used for statistical purposes.

Table 1.2 *Definition of basic food and cash crops*

Basic food	Commodities ('cash crops')
Pulses	Sugar
Sugar	Oilseeds
Vegetable oils	Fibre and tobacco a)
Starchy root	Fruits and Vegetables
Cereal: rice, maize, wheat	Coffee, tea, cocoa a)
Meat	Other tree crops (fruit, oil palm, rubber)
Milk	Fish and seafood b)
	Flowers and plants a), b)
	Timber and other wood products b)

a) = predominantly export crops; b) = not included in the statistical analysis in this report.

Source: Achterbosch et al. (2014) (with slight adjustments).

2 Food markets, food reserves and food security in Sub-Saharan Africa

2.1 Food production, consumption and trade patterns

2.1.1 Production and consumption

The African continent produces a wide variety of food and cash crops, depending on biophysical and climatic conditions, as well as market and policy-driven factors. Yet, many countries still rely heavily on single-crop production for national food security, which largely determines the total calorie intake of rural populations. While different crops characterise agricultural production in different regions of Sub-Saharan Africa (SSA), maize is the dominant crop in many SSA countries, accounting for the largest share of total harvested agricultural area (e.g., 50% or more in countries like Lesotho, Zimbabwe, Zambia and South Africa, and 40-50% in Botswana and Malawi) (FAOSTAT). At the same time, evidence shows that staple crops account for a large share of food consumption (e.g., maize accounts for 46% of food consumption in Zambia, rice for 70% in Madagascar), particularly among poor and vulnerable farmers.

Agricultural production patterns are linked to what the food that is eaten in Africa. Figure 2.1 shows the intake (in calories per capita per day) of various staple food products. Over time, the average African citizen is eating more rice, while the importance of crops such as millet and sorghum is decreasing.

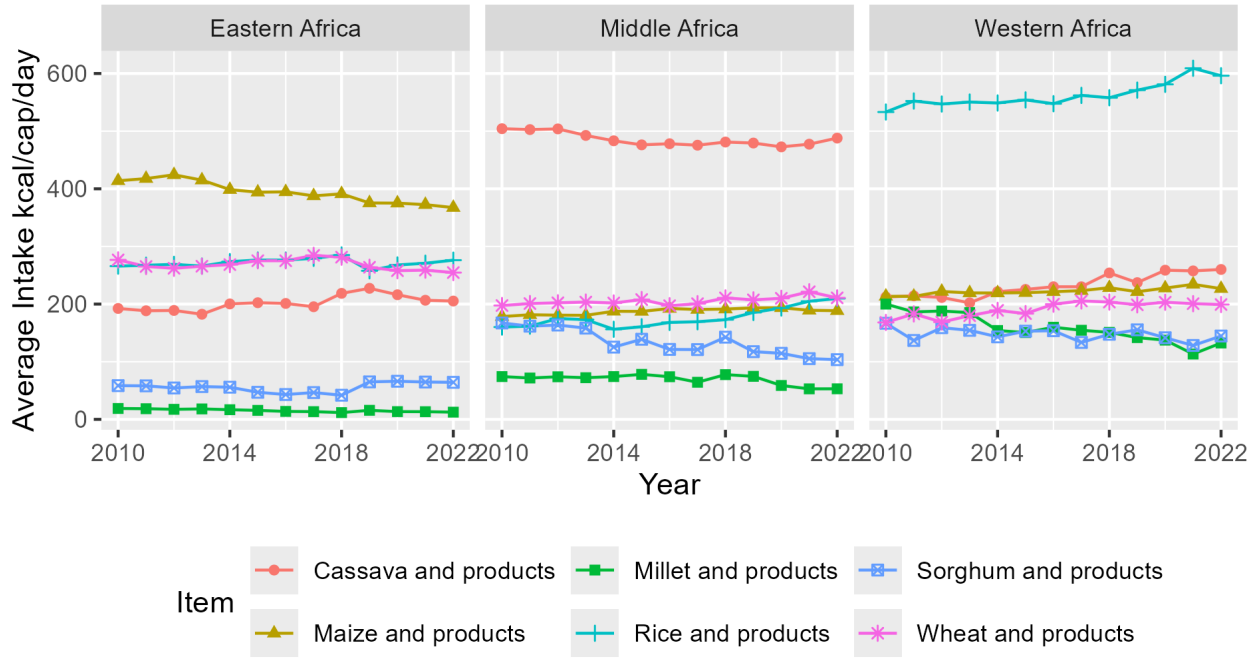

Figure 2.1 *Intake of staple foods (in average intake kcal/cap/day) in three African regions*

The average African citizen is getting richer, which translates into a steady increase in the amount of protein consumed, particularly from animal sources. However, this is a slow process, as is shown in Figure 2.2.

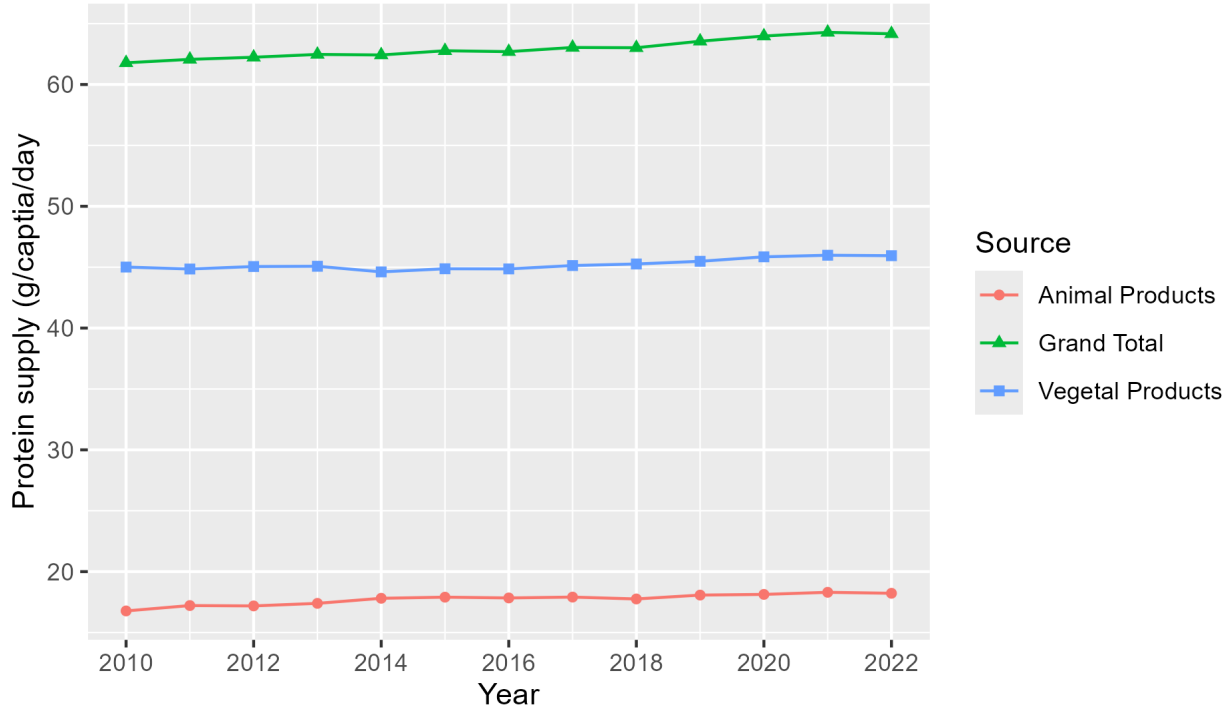

Figure 2.2 *Intake of proteins in Sub-Saharan Africa*

2.1.2 Trade

Many African countries depend heavily on imports of wheat, rice and other food staples. Figure 2.3 displays the average share of cereal imports in total cereal supply in each of the regions in our study region. The averages in the graph hide the variety, with some counties – such as Malawi or Tanzania – not importing much at all, and some – such as island nations, Congo, Gabon and Somalia – importing well over 50% of their cereals. In total, around 25% of the cereals consumed in the Sub-Saharan Africa are imported, and that percentage is rising slowly over time.

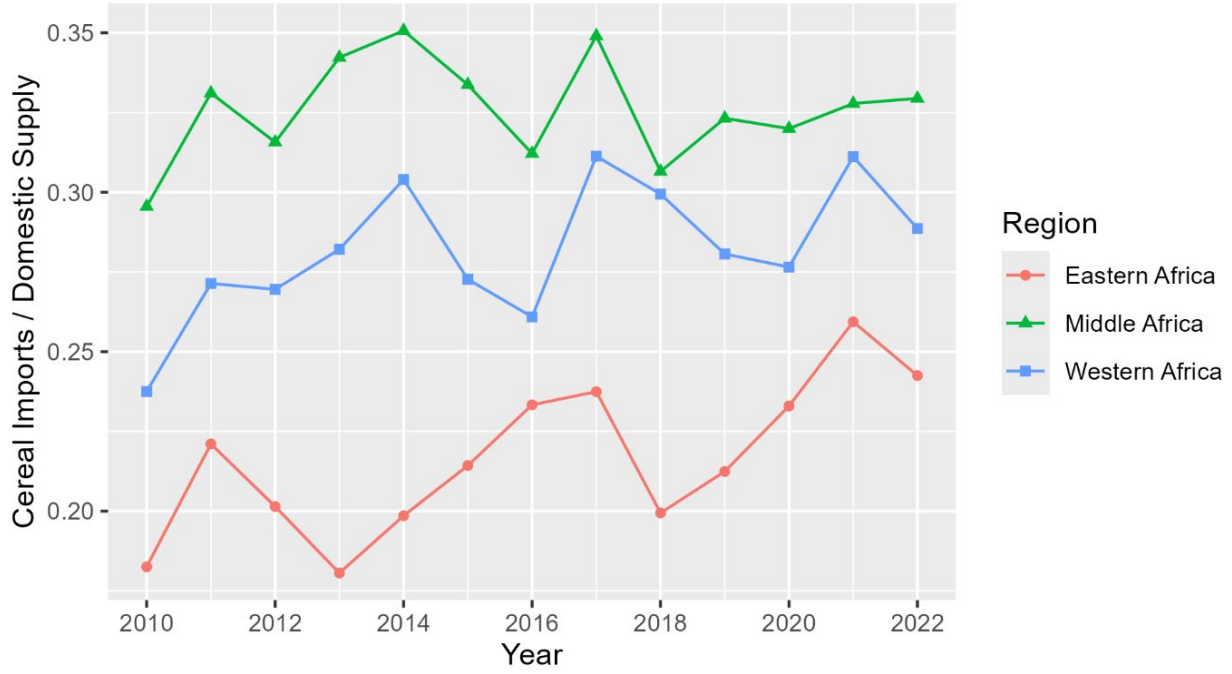

Figure 2.3 *Cereal imports as share of total supply*

2.2 Does Sub-Saharan Africa produce enough food to feed itself?

Over the previous decade, SSA has continued to be the region of the world with the highest per capita rate of food insecurity and undernourishment (FAO, IFAD, UNICEF, WFP and WHO, 2024). The drivers of this food and nutrition insecurity are complex and multifaced and occur despite SSA's agroecological diversity and land abundance. On aggregate, SSA has a trade deficit in major food items, low comparative agricultural and fish production, and a rapidly burgeoning population, where over the coming decade, the trade deficit for major food items is expected to deepen as the need for imports grows faster than the supply of exports (OECD/FAO, 2023). SSA therefore faces the question of how it will sustainably source enough food to feed its growing population.

The question posed above raises the concept of food self-sufficiency, a term that is often used to describe if a country can satisfy its food needs from its own domestic production (Clapp, 2017). However, some research suggests that food self-sufficiency should be seen on a continuum of what is contextually suitable between domestic production and international trade in food (Clapp, 2017). The literature on food self-sufficiency in SSA captures this contextual nuance (and complexity) between stimulating domestic production and accounting for food trade deficits.

While some studies argue for agricultural intensification for yield gap closure to reduce dependence on cereal imports (Van Ittersum et al., 2016), others argue for an increase in agricultural production in Africa in order to meet the demands of both national *and* international markets (Giller, 2020). Indeed, 'the conundrum [in SSA] that must be addressed is how to provide cheap, nutritious food to feed the growing urban and rural populations while creating incentives to stimulate increased agricultural production' (Giller, 2020). Particularly for small farms, the incentivisation of agricultural production for improved food self-sufficiency seems to be of key importance, as most food in sub-Saharan Africa is produced on small farms.

In the pursuit of agricultural intensification, some studies focus on the role of irrigated agriculture in driving food self-sufficiency (Van Ittersum et al., 2016; Darko et al., 2020), while others emphasise the role of medium-scale farms in driving agricultural transformation to these ends (Jayne et al., 2019). However, a recent large-scale cross-context study on food self-sufficiency in SSA showed that options for agricultural

intensification were limited by small farm size and the lack of economic incentives; while even in cases where yield gaps were closed, food insecurity and poverty remained, and only a small proportion of the rural population could derive a living income from farming alone (Giller et al., 2021). This suggests that potential trade-offs in the pursuit of agricultural intensification must be contextually understood, while agricultural development for food security in SSA must include efforts to satisfy subsistence consumption needs *and* develop a living income in order to effectively address food insecurity through agricultural intensification.

Echoing the need to contextually situate food self-sufficiency in SSA, others emphasise the need for disaggregation of the region, where some research shows that only four countries – Nigeria, Angola, the Democratic Republic of the Congo (DRC), and Somalia – accounted for most of SSA's net agricultural import position in 2020; the rest of the countries in the region being net agricultural exporters (Fox and Jayne, 2020). The need for the disaggregation of SSA countries does seem appropriate here as there seems to be a significant variance between countries based on a degree of a high degree of vulnerability to international market development (i.e., dependent on one or only limited sources of food imports or dependent on only one or a few export markets for foreign exchange earnings), degree of natural resource richness, and whether a country is low- or low-middle- income. Indeed, more recently, the conflict between Ukraine and Russia as well as the COVID-19 pandemic showed how vulnerable many SSA countries (and their strongly agriculturally-based economies) were to disruptions in imports of cereal staples, fertilisers, and fuel (Ogunkola et al., 2024). This also emphasised context dependency (the difference in impact per country), as well as the overall need to boost farm production and diversify supply chains to improve resilience and overall agricultural, food and nutrition security as a form of food self-sufficiency (ODI, 2024).

To provide some background to the question whether Africa produces enough food, or if too much food is wasted, or too much of Africa's agricultural potential is dedicated to production of export crops, we present some cross-sectional data from FAOSTAT below, with each dot in a panel showing the average values since 2015 for one country. Note that this is purely intended to provide cross-sectional trends, and we make no causal claims based on these simple plots.

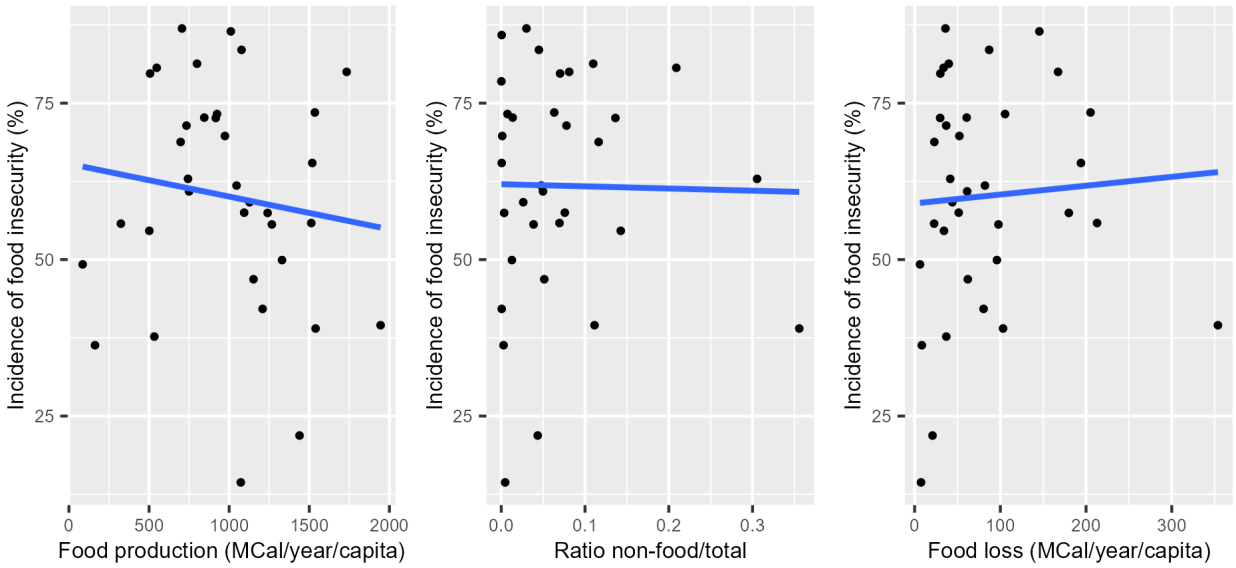

Figure 2.4 *Food losses, food production and specialisation in non-food production vs. Food insecurity since 2015. The blue line is a linear fit*
Source: FAOSTAT.

The left panel of Figure 2.4 plots the incidence of food security against the production of food, expressed in MCal/year/capita.[8] It shows that countries with higher food production, have lower incidence of food insecurity. A logical conclusion would be that dedicating more resources to production of food, and less to the production of non-food agricultural commodities would thus lead to a lower incidence of food insecurity. However, the middle panel of Figure 2.4 shows that countries with a higher ratio of production of non-food products to food product are not necessarily more food insecure, and vice versa, – this is likely due to food (in)security being driven by other additional factors other than availability of food/non-food products (i.e., utilisation, access, and stability – which are themselves shaped by the typology and occurrence/concurrence of shocks and stressors). Finally, the rightmost panel shows that food losses are correlated with higher incidence of food insecurity. Note that food losses include all post-harvest losses until the retail stage. Again, this is purely intended to show overall trends and cannot be used to support any causal claims. It does show that there is great variety among the countries in this study in the extent to which food (in)security is related to, respectively, food production, food losses and specialisation in non-food agricultural products.

The interviews that we had with key stakeholders in the field support the stylised trends that we saw from Figure 2.4: respondents stress the agricultural potential of Africa, but that currently productivity is low and losses high, resulting in high imports as domestic production falls short of covering domestic food needs.

In conclusion, this section has argued that the answer to the broader question of 'Does SSA produce enough food to feed itself?' should be understood through the concept of food self-sufficiency. This is a concept that is determined not just by domestic food production potential, but by contextually dependent trade-offs and synergies between stimulating domestic food production and accounting for food trade deficits that exist on a continuum.

The findings also highlight an increasingly food-import-dependent SSA compared to a largely untapped agro-ecological potential that could satisfy domestic needs if further developed – leaning more towards food self-sufficiency as a domestic production paradigm. The FAOSTAT data showed correlations between decreased production and increased food insecurity, and increases in food loss with increased food insecurity. While interestingly, countries with a higher ratio of production of non-food products to food products are not necessarily more food insecure (and vice versa); and across the region, there is a huge variance between countries for each set of findings (see Figure 2.4). This variance between countries in the region was also evident when looking at the impact of recent global shocks (COVID-19 and the war in Ukraine) on SSA's food systems, and their vulnerability to them. Given this vulnerability and context-dependency, the literature suggests that key factors determining the context of food self-sufficiency in SSA include the degree of vulnerability to international market developments, the richness of natural resources, whether a country is low- or low-middle-income, as well as the diversity of supply chains and the potential for domestic agricultural intensification.

In terms of domestic agricultural intensification, the literature shows that though many technical approaches are available (irrigation, medium farm development etc.), efforts to develop this sector should overall look to satisfy subsistence consumption needs *and* develop a living income in order to effectively address food insecurity. In terms of the driving factors behind this food insecurity, though the FAOSTAT data showed a correlation between increased food loss and increased food insecurity, it is important to emphasise that the primary causes of food insecurity in SSA include:

> 'weak economic growth, gender inequality, high inflation, low crop productivity, low investment in irrigated agriculture and research, climate change, high population growth, poor policy frameworks, weak infrastructural development, and corruption' (Wudil et al., 2022).

[8] To convert total food production, given by FAO in quantities for each crop, we convert the quantities of food lost and produced to kcal, using the same conversion factors that are used in the FAO's food supply figures, which take into account that different ways of processing yield different amounts of nutrients.

3 Reasons for difficulties in filling food reserves

3.1 Introduction

In this chapter we address the questions whether and when countries had difficulties filling their national food reserves due to drops in national production, and whether those adverse situations happen more permanently than before? Also, in case of adverse situations, are these more prevalent in regions/countries highly specialised in food production rather than in regions/countries highly specialised in non-edible/cash/export food production, or vice versa? Both questions are addressed by data analysis and literature review, the latter either providing further supportive observations to the conclusions based on the data analyses or by qualifying the findings from the data analysis.

The data analysis to answer the two questions is based on the following steps:

1. We identify adverse situations, where countries had difficulties in filling up their national food supply. For this, we rely on FAOSTAT food balances, which track how much food is produced, consumed, imported, and exported in each country, split by crop. We use the Global Hunger Index to validate how well this approach succeeds in identifying situations of food insecurity (Section 3.2).
2. We use food and non-food production data from FAOSTAT to characterise countries by their degree of specialisation in non-food production. We cross-reference this data with the Food Import Vulnerability index by IFPRI (Section 3.3).
3. We then combine this data with food production data from FAOSTAT to answer Questions 2 and 3 from Table 1.1 by seeing if adverse situations happen after drops in food production, in countries specialised in non-food production (Section 3.4). We visualise our findings using maps and graphs.

For this, we make the following definitions when indicating adverse situations where countries had difficulties in filling up their national food reserves. While we can observe levels of food reserves (split over various crops), we cannot accurately determine the difficulties countries had in filling up those reserves. We therefore use national food supply in kcal/capita/day from FAO's Food Balances as a proxy, which measures the total supply of food available to the country's population, converted to caloric value using appropriate composition factors. If this number decreases for several years, this is indicative of falling food reserves. We thus define adverse situations as follows*: a spell of two or more years in which food supply decreases, and in which the lowest food supply is under 2,200 kcal/capita/day*. The minimum caloric intake according to the FAO is 2,000 kcal/day for an adult, but given unequal distribution, problems are likely to happen above this level.

3.2 Identification of Adverse Situations

Using the definitions above, we identify Adverse Situations, or spells of decreasing food supply.

Table 3.1 *Number and severity of spells of decreasing food supply by decade*

Decade	N	Mean Length (Years)	Mean Calorie Loss (Kcal/cap/day)
1960s	19	3.6	125.4
1970s	28	3.3	139.2
1980s	41	2.8	100.2
1990s	21	3.0	80.2
2000s	17	2.6	36.7
2010s	13	3.5	116.4
2020s	1	2.0	37.0

Source: FAOSTAT.

Spells starting in the 1960s last longer than in the following decades, and in general we see spells getting shorter and less severe until the 2010s, in which this trend is broken.

In the subsequent sections, we focus on the six most severe adverse situations (in terms of decrease in kcal/day) since 2000. We focus on six only, because our goal here is to plot the trends: having more than six elements in a plot results in a cluttered unreadable plot. We focus on events since 2000, because the further we go back in time, the less likely the spells are to yield meaningful advice in today's world, and the more pre-2000 adverse situations we consider, the more cluttered the graphs. The world economy has changed considerably since then, and even many countries that were around in the 1960s no longer exist. If requested, we are open to moving the cut-off point to another year or increasing the number of adverse situations considered.

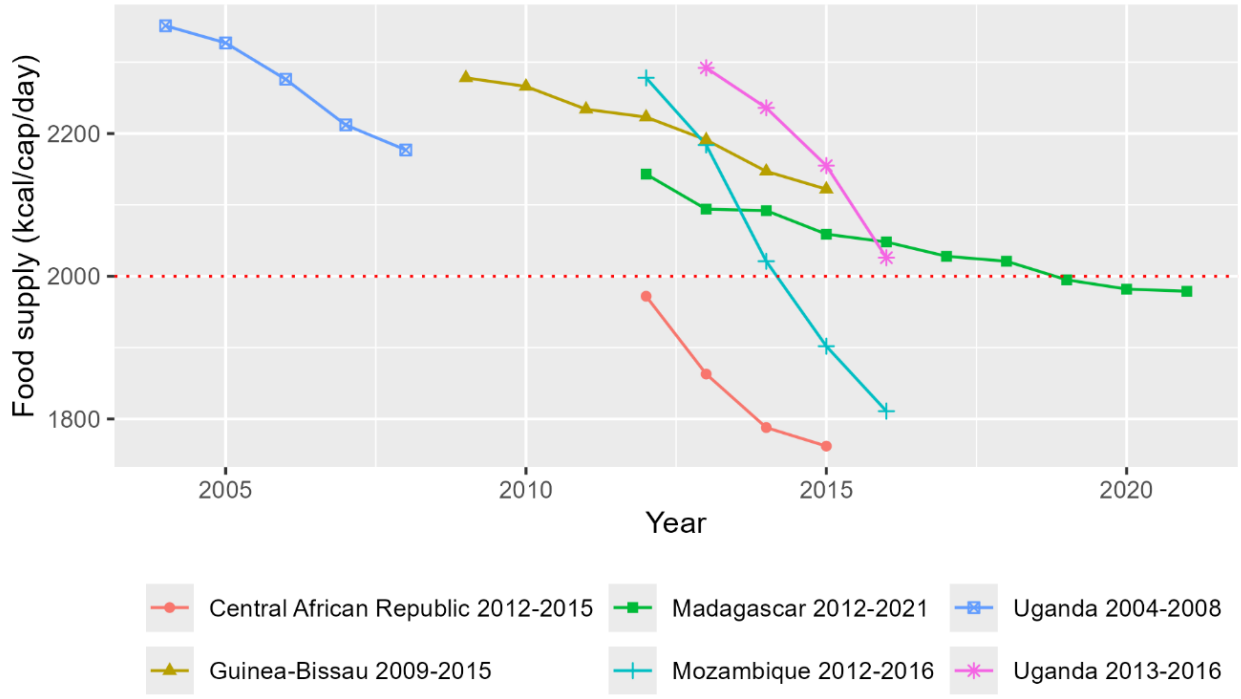

Figure 3.1 *Most severe adverse situations, in terms of calories lost, after 2000*
Source: FAOSTAT.

We thus identify six adverse situations, which typically represent a drop in the caloric value of the food supply of about 20%. This includes sharp drops in a limited number of years (for example, Central African Republic 2012-2015) as well as slower, more gradual declines, such as Madagascar 2012-2021. Notably, Uganda is included in this list twice (2004-2008 and 2013-2016), although it is not among the most food-insecure nations in Africa according to the Global Hunger Index. At the same time, we do not include food-insecure countries such as DR Congo, Chad, and Niger. This is due to our focus on *drops* in food supply, which means that countries that are consistently food insecure – often due to persistent conflict and political instability – are not included. For the purposes of this research, this is not a problem, as we are mostly interested in the effects of specialisation in non-food production, which is usually not something that happens in conflict-affected countries.

3.3 Characterisation by non-food specialisation

We largely follow the classification of the FAO between Food and Non-Food.[9] However, the FAO's definition of Food products includes stimulants and spices, the consumption of which do very little to address food security, and some of which (coffee, tea, cocoa) are often grown for export. We therefore exclude the following products from the food products category:

Table 3.2 *Products that the FAO classifies as food and that are considered non-food for the purposes of this report*

Item
Anise, badian, coriander, cumin, caraway, fennel, and juniper berries, raw
Cinnamon and cinnamon-tree flowers, raw
Cloves (whole stems), raw
Cocoa beans
Coffee, green
Kola nuts
Maté leaves
Mustard seed
Nutmeg, mace, cardamoms, raw
Other stimulant, spice, and aromatic crops, n.e.c.
Pepper (Piper spp.), raw
Tea leaves
Vanilla, raw

We then compute the ratio of the value of production of non-food to the total value of agricultural production. All values are the total value of a country's production in constant 2014-2016 International Dollars. These are the six most non-food/export-oriented producers:

Table 3.3 *Top 6 countries specialised in non-food production*

Country	Ratio Non-food
Côte d'Ivoire	0.36
Kenya	0.28
Liberia	0.24
Equatorial Guinea	0.16
Malawi	0.14
Sao Tome and Principe	0.13

[9] FAO's classification of Food and Non-Food can be found at https://openknowledge.fao.org/server/api/core/bitstreams/133abe54-26f6-48a5-afeb-e512bcc37ebb/content.

It is important to note that these are not the countries IFPRI considers most vulnerable to import price shocks in their Food Import Vulnerability Index (FIVI). In the maps and figures below (Figure 3.2), we compare our ratio with the FIVI and with the Global Hunger Index (GHI).

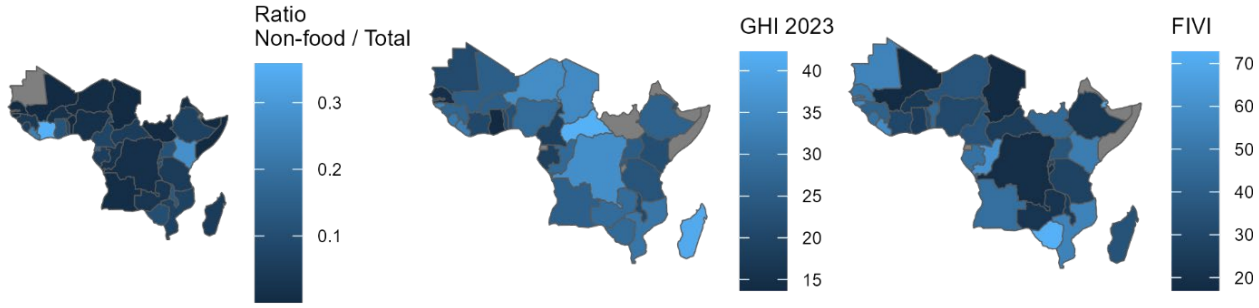

Figure 3.2 *Specialisation in non-food production, the Global Hunger Index (GHI) and the Food Import Vulnerability Index (FIVI) across Sub-Saharan Africa*
Source: FAOSTAT, IFPRI and Global Hunger Index.

There is very little correlation between the three maps. Even though a high ratio of non-food production would seemingly imply a high risk in the case of food price shocks, countries with a high ratio of non-food production differ from those with a high FIVI. This is because in this report, we purely look at the production side, while IFPRI mostly considers consumption: where does food come from? Consider, for example, Côte d'Ivoire, a country with a high degree of specialisation in non-food production due to its substantial cocoa exports. Yet, it does not have a very high FIVI because it still produces sufficient food and is able to import enough to meet domestic food needs.

In addition to trade, food security is much affected by macroeconomic factors (Diaz-Bonilla, 2015; Brooks and Matthews, 2015; OECD, 2019).[10] Indeed, macroeconomic factors influence the four components of food security through different channels. Domestic production and imports determine availability (first component), and economic growth, generating employment opportunities and higher income levels, is strongly linked to food access (second component). In fact, it is evident that the ultimate driving force of global food security is the overall level of economic development, affecting each of its dimensions (Timmer, 2002; Regmi and Meade, 2013). Government revenues might also be used to implement policies and investments in favour of food security such as research and development (affecting availability and stability, the first and fourth component of food security), basic health services and food assistance and social protection programs (affecting use/nutrition, the third component). Nutrient security pertains to the individual the most, but is largely affected by income and access to food determining factors (e.g., Global Panel, 2017). From this perspective, actions that affect non-agricultural markets and employment - such as building infrastructure or ensuring equitable access to education – could be just as important for food and nutrition security as policies and investments in the agri-food sector. On the whole, this means that the discussion on trade and food security needs to be placed in the context of an overall framework of macroeconomic and exchange rate policies (Diaz-Bonilla, 2015; OECD, 2019).

[10] This section is taken from Van Berkum (2021).

3.4 When do adverse events happen?

We use FAOs food production indices to track country's food production through the six adverse events identified above. We rescale the index to be 100 for the first year of the negative spell and rescale the years so that year 0 is the first year of the spell.

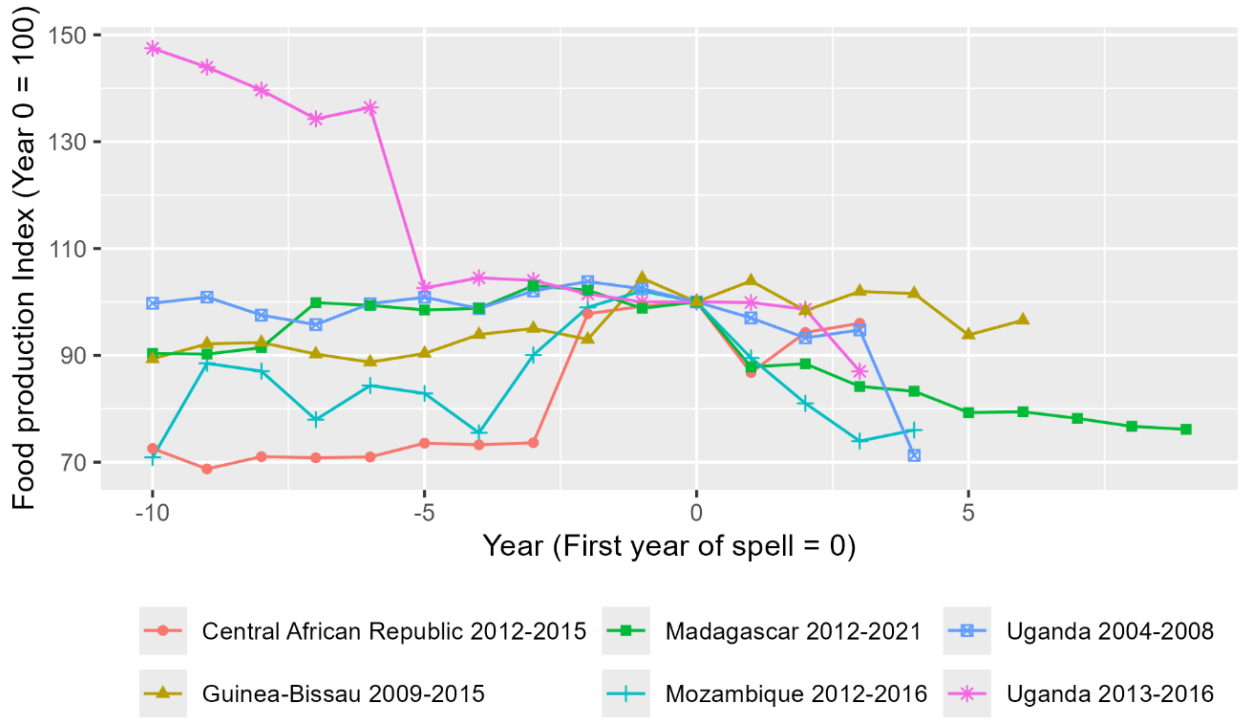

Figure 3.3 *Food production in countries with adverse situations*

The adverse events displayed in the figure are usually accompanied by declining food production, since years 1 and onwards are below 100, except in the case of Guinea Bissau. The years leading up the adverse event are different across the board: there are countries with sharply declining food production (Uganda 2013 – 2016) but also countries with sharply increasing food production (Central African Republic, Mozambique). But the immediate years before the adverse events, food production is mostly falling slightly.

Though some literature explores the role of national food reserves in enhancing food and nutrition security in SSA (see in particular Galtier et al., 2018, for comparative case studies), we found no explicit literature exploring a causal link between national food production, insufficient food import, and insufficient food reserves.

Figure 3.4 tracks the food supply over time in the countries most specialised in non-food production.

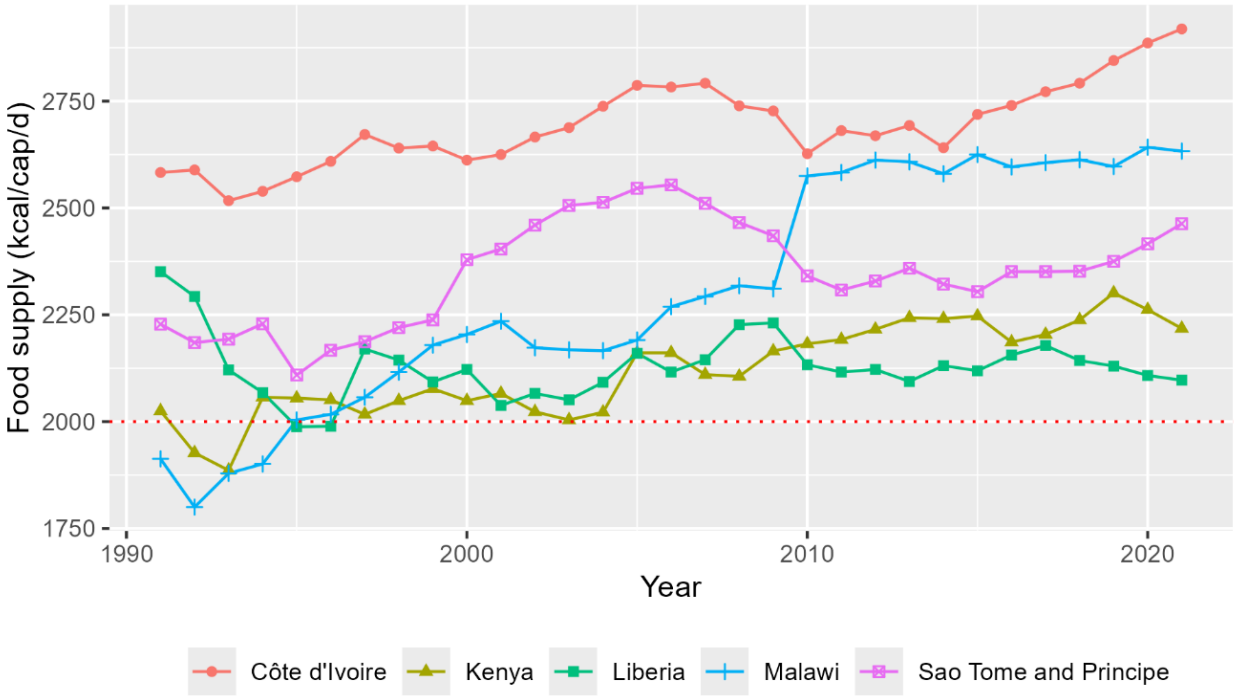

Figure 3.4 *Food supply (in kcal/cap/day) in countries specialised in non-food production*
Source: FAOSTAT.

These countries are mostly seeing rising food supply, with some exceptions: Liberia being rather stagnant, and some episodes of decline, such as in Sao Tome and Principe. The levels of food supply are also higher than those seen in the countries with adverse situations: most countries here are above the 2200 kcal/cap/day line.

We can also turn this around: how are the non-food specialisation ratios in countries that have faced the most severe adverse situations? This is displayed in Figure 3.5.

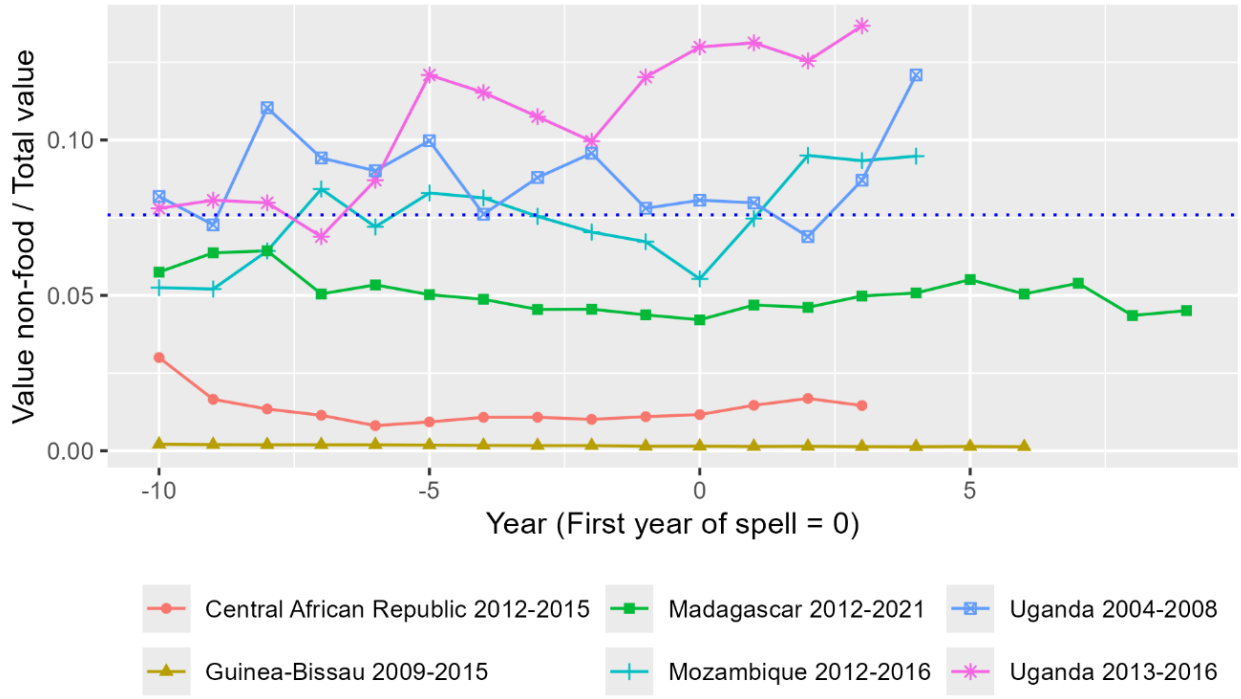

Figure 3.5 *Food specialisation in countries with adverse situations. Note: The dotted line indicates the average for all Sub-Saharan African countries*
Source: FAOSTAT.

The picture here is mixed: Uganda and Mozambique have ratios that are higher than the continental average, while CAR, Guinea-Bissau and Madagascar have lower ratios. This suggests food insecurity is not (always) driven by reliance on non-food crops.

To conclude this section, we summarise our main observation as follows.

From the data analyses, we identify many situations in which national food security declines, and these appear to be correlated with declines in national production. The duration and severity of these negative events decreased in the period up to 2010, but increased thereafter. The data analysis does not indicate a clear relationship between specialisation in export crops and the incidence of declines in national food security (negative events). Nor does the data suggest that food loss is a major cause of food insecurity. The literature review shows that food security depends on many different factors, which collectively and contextually influence how vulnerable the population is to food security.

4 How non-edible food and cash crop production affects food security

In this chapter we address the two following questions from the ToR:

a. Does the production of non-edible/cash/export food lead to the depletion of natural resources, reduction of local food availability, food insecurity, biodiversity loss, reduction in resilience, overdependency on big agro-industry players, and decrease in livelihoods of smallholder farmers?
b. Does non-edible/cash/export food production have spillover effects on other food production, contribute to food security, nutrition, biodiversity, farmers' resilience, and, more broadly, sustainable agriculture?

The two questions as formulated above are each other's counterparts, and can be summarised in the question: What are the impacts of (further expansion of) cash crop production on food security, socio-economic and environmental outcomes of the food system? In the following sections we distinguish these three dimensions of impacts discussing latest insights from literature on each of the outcomes separately although the consequences of cash crop production are shaped by the interrelationship of outcomes on these three dimensions.

4.1 Link between cash crop production, food availability and food security

Food for direct (home) consumption and cash crops can compete for available agricultural land and/or labour. An expansion of cash crop production can therefore limit local food production, reduce its local availability and subsequently may reduce food security of the local population. However, to discuss the impact of cash crop production on food and nutrition security (FNS) it is necessary to understand the processes that determine FNS outcomes on its four dimensions. Figure 4.1 presents a simple framework of analysis for understanding along what channels cash crop income can have an impact on the four FNS dimensions. The cash crop farmers or farm workers who generate an income from cash crops will have more money in their pocket to buy food. Depending on price developments, this is a direct improvement of food access. Income growth also has implications for other dimensions of food security. The key channels of impacts of cash crop income on food security – illustrated in Figure 4.1 – are clarified in the text below the figure.

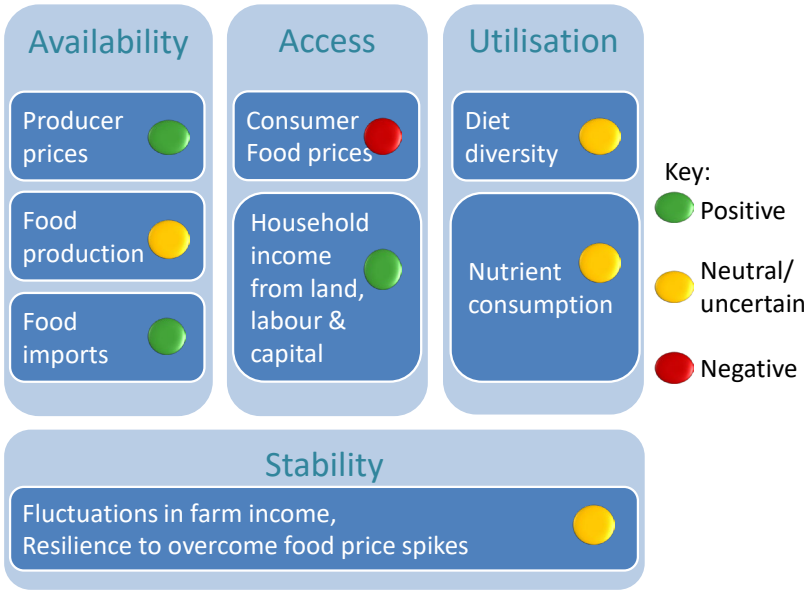

Figure 4.1 *Channels of impact of cash crops income on the four dimensions of food security*
Source: Achterbosch et al. (2014).

Food Availability consists of three factors related to the physical availability of food:

1. *Agricultural producer prices*
   Cash crop income will have a positive impact on the agricultural wages and encourages demand for food, which provides a stimulus for production expansion and raised farm income.
2. *Food production*
   On the one hand, many traditional cash crops are not strictly food (such as cocoa, coffee, tea or cotton) and will compete with food crop production. On the other hand, farm revenues from cash crops are often invested in food production, for example in the increased use of farm inputs, raising food production.
3. *Food imports*
   Cash crop revenues are often a major source of export revenues, which flow into the domestic economy, generate income to traders and other food system actors involved and provide opportunities to them to purchase food that is imported.

Food Access consists of two factors related to purchasing power:

1. *Income*
   The farmers or workers who earn more income are able to spend more on food of a better quality.
2. *Consumer food prices*
   In poor communities, a substantial share of rising income from cash crops will be spent on food consumption. The increased food demand could result in higher food prices, which has a negative impact on households depending on the markets for their purchases of food. Cash crop production may also replace domestic food production, shifting resources such as land, labour and capital from food production to cash crop production. Consequently, domestic food production declines and can thus further increase food prices (locally).

Food Utilisation is related to what type of food is consumed:
Diet diversity and nutrient consumption are essential drivers of nutrition security. Income growth provides opportunities to invest in more nutritious foodstuffs and general hygiene. However, farm households may not necessarily spend additional income on improved diets and thus the outcome is uncertain.

Food stability is a dynamic dimension:
Income from cash crops may fluctuate, as cash crop prices are typically rather volatile, which is not conducive to a stable income. However, farmers or farm workers who earn more income (spending relatively a smaller share of their income on food) are able to invest more in assets such as in land, fertilisers or cattle, or in health and schooling. This way, they are able to improve their resilience to crises and long-term earning capability.

Various recent empirical analyses of cropping systems in which cash crops play an important role, conclude that producing crops for the market has a positive effect on the food security of the farming households involved (Baker et al., 2023; Hashmiu et al., 2024; Esheti et al., 2022) or at least do not have a negative impact on food security per se (Goswamia and Choudhury, 2019), but all point out some preconditions for such an effect. For example, Esheti et al. (2022) evaluate the impact of adopting improved sesame varieties on farm household food security in northwestern Ethiopia. Their findings indicate that the adoption of new sesame varieties significantly reduced the propensity of food insecurity through increased food consumption expenditures, improved nutritional food intake (consumption scores), and the probability of food security of a household. In a case study in Ghana, Hashmiu et al. (2024) show that where farmers diversify their cropping pattern with income from tree cash crops like cocoa and cashew, household income and food security are enhanced. These analyses highlight the complementarities of a mixed system, in which food crops are grown alongside cash crops such as tree cropping or cocoa: growing food crops directly contributes to food availability and marketing cash crops generates income that improves access to food. Further diversification of cash crops in such a system can ensure a further increase in income and strengthening of food security, but as Hashmiu et al. (2024) highlight, not all farmers' households are able or willing to take the risk: diversification into cash cropping is conditional to having assets (such as land and/or livestock ownership), economic factors (such as annual crop income and access to off-farm income; both as a source for own savings to fund investments on the farm) and access to extension/technical support and credits.

Two interesting studies show that cash crop production can be an important development path for smallholder farmers but that focusing on increasing income from cash crops will not necessarily have a predictable or progressive impact on wellbeing of farmers' communities. Based on evidence from cash crop agroforestry systems in Ghana and Ethiopia, Hirons et al. (2018) highlight how contextual factors, such as the provision of communal services, the nature of land holdings and the quality of local governance, mediate the potential poverty alleviating outcomes of income increases. The authors, therefore, conclude that a policy of generating income through cash crop production can contribute to reducing poverty, but one must take into account the fundamental social relations that underpin the dynamics of poverty (e.g., access to education is gender dependent and landownership is related to ethnicity). Holmelin's analysis (2021) comes to a similar conclusion. Her case study from Nepal reflects on the currently implemented government policies that pursue large-scale, mechanised, specialised, and commercial agriculture. However, farmers prioritise diversified subsistence production of resilient and versatile food crops and consider cash crops only as a supplement. Cash crops represent a potentially profitable source of income, but farmers also clearly see the income and market risks. Full commercialisation of agriculture would jeopardise household and community food security, weaken social mechanisms for food and labour exchange based on trust and reciprocity, and break with traditions. The Nepalese case shows that farmers' motivations to balance subsistence and market production are multiple and interrelated, because their economic activities are deeply rooted in social and cultural structures.

In the discussion on the relationship between cash cropping and food security, the advantages of mixed agricultural systems are often emphasised. Mixed systems means that there are multiple crops and/or a combination of crops and livestock at a farm, regional or national scale. Based on a systematic review of recent studies Waha et al. (2022) conclude that diversity of farming systems at farm scale is positively associated with food security at household scale, on three of its dimensions (availability, access, utilisation; the review found no robust result for the stability dimension). Sekaran et al. (2021) also advocate integrated crop/livestock forms of agriculture, at different scales, but in particular for smallholders who have little opportunities to expand their agricultural land and need to minimise their economic risks, arguing that mixed and integrated agricultural systems have a positive relationship with food security but also favourable socio-economic and environmental impacts. The latter, though, depends on that farmers apply the integrated crop-livestock system (ICLS)[11] principles such as, for example, using crop residues as fodder for livestock and improving soil fertility through manure and urine deposition of livestock. Sekaran et al. (2021) argue that successful implementation of ICLS requires public and/or private support to provide capital and educational services to subsistence farmers and support to create (new) market opportunities.

In conclusion, growing cash crops for agricultural income generation can have a positive impact on food security especially when it is done alongside food crop production as it combines two dimensions of food security - food availability and food accessibility. However, farmers are very aware of market risks and need buffers or collateral (e.g., guaranteed market sales and prices) to take up or expand cash crop production (see next section). This is another reason for small-scale farmers to stick to mixed agricultural systems, combining crops and livestock for either subsistence and/or markets.

The stakeholders we interviewed largely agreed with these conclusions. Our respondents grade the proposition 'Investing in cash crops for export revenues and high-end markets is a promising strategy for agricultural development' between 3 and 5. All of them stress the importance of diversification, meaning having a good mix of cash crops and food crops, especially at the farmer level but also in a more macroeconomic perspective.

[11] Simply defined as a farm that produces both crops and livestock, as opposed to farms that specialise in either crops or livestock.

4.2 Socioeconomic impacts of cash crop production – empirical evidence

Economic risks associated with cash crop production are well described in literature (see also Achterbosch et al., 2014). Market prices may vary during the season and over the years, affecting farmers' income from the produce marketed.[12] And when there is only one market outlet on which farmers depend, this constitutes a major risk. Examples are the cocoa, coffee or tea boards, cooperatives or large export companies that buy up all the produce and set prices. Other examples are cash crops produced under contract farming arrangements, usually for fresh fruits and vegetables, where the produce is sold to supermarkets or exporters and has no local market. Having one, well-established market outlet saves transaction costs; farmers do not need to find out the best price, do not need to spend a lot of time to negotiate etc. Sometimes the sole buyer offers a range of services as well, such as supply of inputs (seeds, fertiliser) and training. However, in such a situation there is a risk that the buyer determines prices at levels that do not cover farmers' production costs. If farmers lack bargaining power, they may lose most of their margins. Using data across 157 agricultural cash products in Ecuador, Zavalla (2023) documents that where few exporters dominate the market, farmers earn a small share of export revenues; less than a quarter on average and lower when the exporter purchases a greater share of domestic output of a given crop. Moreover, Zavalla further argues that if there are only a few, market-dominant exporters, farmers will not or hardly benefit from rising/higher international prices.

In the interviews we did for this study, many respondents also raised the issue of volatile prices of cash crops, and the unfair distribution of the benefits of export agriculture: very little of the added value of the value chains stays within the countries of origin. The combination of these two mean that farmers can be put in a very vulnerable position if they choose to grow more cash crops at the expense of food crop production.

Fair trade agreements can lead to farmers receiving a larger share of export revenues. There are various business initiatives where exporters grant farmers a fair share of the revenues (for example in the cocoa/chocolate and coffee sectors). In addition, there are other forms of food value chain or market organisation that may offer (small) farmers better grip on the revenues that result from the export of their cash crop. Some examples are: collective action models, farmer-owned enterprises, value chain contracting, and social enterprise models (examples are the above mentioned fair trade organisations or businesses) (see Kuijpers et al., 2021, for more examples and details on how these possibly can operate).

Most studies on cash crop production focus on impacts on individual farms, commodities or value chains. Castella et al. (2023) analyse the dynamics of crop booms and the drivers of land use changes behind them, using 14 case studies in Laos, Thailand, Cambodia and Vietnam, in which particular sites and landscapes were studied that underwent rapid change in response to the introduction of specific market-oriented crops, largely shifting cultivation to monocropping (e.g., maize for feed livestock production, rubber, cashew or fruit trees). The case studies show examples of positive socioeconomic impacts such as increased household income, livelihood improvements (e.g., increased number of brick houses and motorcycles) and extension of schooling among children and youth. However, also income variability and increased indebtedness (due to high input costs, for instance) are documented. In addition, inequality among village households increase; that is, livelihoods improvements go with severe socioeconomic differentiation within villages, particularly across social groups with different strength of land claims. However, when shocks such as those related to price, soil fertility and/or crop diseases occur, the effects are also very different within villages (or even families) and also at other scales (e.g., regional).

The examples from the case studies discussed in Castella et al. show that socially insecure farmers were left with insufficient income to repay the debts from the costs of labour and farm inputs. The richer farmers, on the other hand, were able to switch to other crops, while some farmers lost their land and had to leave the area to find alternative work or resorted to wage labour. This analysis implies that the promotion of cash crop production goes beyond the level of individual farm or chain scale; it can also lead to skewed income developments (concentration of wealth) and economic dependencies (on creditors, on wage labour) at a regional scale.

[12] For examples of price variability of cash crops like coffee, cocoa tea and sugar, see tradingeconomics.com/commodity.

Evidence from the above reviewed literature show the unequal distribution of gains associated with trade in cash crops, either in domestic trade and/or exports. The socioeconomic impact on farmers depends on the institutional arrangement. In conventional arrangements, farmers are vulnerable. Exceptions exist, i.e. business initiatives in which farmers are granted a fair share of revenues, such as collective action models, farmer-owned enterprises, value chain contracting and social enterprise models. Seen through a regional lens, cash crop booms can have significant landscape and social impacts, leading to skewed income developments (concentration of wealth) and, if cash crop prices fall short of covering costs, leading to debts that render farmers socially vulnerable.

4.3 Cash crops and environmental impacts

Export-oriented commodities such as soy and oil palm are an important source of income for local producers (including smallholder farmers) in rural areas in Latin America and Southeast Asia. At the same time, their production is often associated with deforestation and biodiversity loss, the latter also because of the monoculture and intensive (i.e., high-input use) cropping practices (Dreoni et al., 2022; Ayompe et al., 2021). A study such as that of Abman and Lundberg (2024) shows what the trade-off can be between better income and environmental impacts in a case study on palm oil production in Central Ghana. A large palm oil mill in the region encouraged small-scale farmers to increase palm oil production offering them production contracts and extending credits which made it easier for farmers to begin growing oil palm and lowered barriers to marketing oil palm output. Based on geo-spatial data analysing land use changes over 20 years, the case study shows significant increases in forest loss in targeted villages immediately after program rollout, coinciding with the timing of farmer enrollment in the programme, and higher average annual forest loss among participating villages continued over the following decade, consistent with the persistence of the programme's effect.

However, the (expansion of) production of cash crops such as palm oil on small-scale farms can also be managed in a way that environmental damage is limited. An example can be found in Dalheimer et al. (2024), who analyse the environmental performance of smallholder oil palm production in Indonesia – where smallholders contribute to 34% of national oil palm production and manage almost half of the country's palm oil area. The analysis uses a panel dataset that combines conventional farm data with a record of plant diversity. The analysis points to substantial environmental inefficiency: the authors conclude from their sample analysis that oil palm output can be expanded by 28% while loss of biodiversity at given input levels could be contracted by 22%. The authors suggest that payments to farmers (in the form of payment for ecosystem services, PES) could induce farmers to use fewer chemical inputs, thereby improving biodiversity, while at the same time enabling farmers to earn a living income. The analysis points to the need for targeted policies that incentivise farmers to adopt environmentally sound management practices, policies that aim to eliminate inefficiencies in production and reward biodiversity conservation at moderate levels of opportunity costs offer promising avenues for more sustainable smallholder palm production. The study by Gutierrez Al-Khundhairy et al. (2023) provide more examples of farming practices in which high yields in palm oil production in Malaysian Borneo are combined with low input intensity 'best management practices' (i.e., minimising herbicide, fertiliser and pesticide use; retaining vegetation cover, and applying crop residues for maintaining soil organic matter), promoting biodiversity and ecosystem functions. Both studies show that applying sustainable management practices do not have to lead to reduced yields, and that small-scale farmers are greatly helped by financial and knowledge support for the implementation of sustainable agricultural practices.

An interesting analysis measuring the environmental pressures of perennial cash crops – cocoa, coffee, macadamia and mango – is by Heidenreich et al. (2020). The study assesses so-called eco-efficiency of smallholder perennial crops in Ghana (cocoa) and Kenya (coffee, macadamia and mango). The improvement of eco-efficiency is an important underlying principle of the concept of sustainable intensification, by simultaneously considering an increase in economic value added per unit of land and a reduction of related environmental impacts. Often, both aims may not be achieved at once, but already a reduction of environmental impacts without reducing yields or an increased yield without increasing environmental impacts would mean increased eco-efficiency and thus sustainability improvements. The eco-efficiency is the ratio between economic value and environmental pressures (an aggregated and weighted index of seven

relevant environmental pressures: nutrient depletion, nutrient surplus, loss of biodiversity, overexploitation of water use, toxicity of pesticide use, soil erosion and contribution to global warming). The study finds 'best practices' (i.e., highest eco-efficiency scores) positively associated with farmer's educational level, labour time and land size. In general, positive impact is highly context-specific. The results highlight the importance of designing effective training modalities and policies that enable knowledge to be put into practice, which includes creating marketing opportunities, providing targeted and regular advisory services and region-wide measures to sustainably build and maintain soil fertility.

In addition to the benefits of mixed farming systems to reduce income and market risks (see Sections 4.1 and 4.2), several studies also point at the environmental benefits to this form of agriculture, claiming that mixed farming systems are considered effective and feasible climate change adaptation strategies (Sekaran et al., 2021; Leakey, 2018; Paul et al., 2018). A review of recent literature (Baker et al., 2023) confirms these insights and argues that diversification of mixed systems can buffer against climate change risks for food production systems by delivering multiple ecosystem services, increasing livelihood resilience and improving household food security. Several examples of mixed crop-livestock systems, agroforestry and integrated aquatic systems illustrate the technical, cultural and socio-economic benefits, challenges and barriers to implementing interventions. Important instruments to support these farming systems include context-specific advice, targeted research and financing mechanisms (e.g., credit, payments for ecosystem services) to farmers and market access support.

One argument for investing in cash crops is that, through the income they generate, these crops provide farm households with the means to save and invest in more productive farms, which in turn benefits the production of food crops on their farms. These so-called spillovers or synergies can occur if farmers, by becoming part of structured marketing chains, gain access to better seeds, inputs, more technical (farm management) knowledge, and perhaps also access to markets for the sale of food crops. Examples as presented in Section 4.1 and 4.2 show that cash crop cultivation can go hand in hand with increased production and marketing of food crops, because the latter also make use of infrastructural and institutional (i.e., market and chain organisation) developments that cash crop cultivation triggers. This leads us to reaffirm the earlier drawn conclusion in Achterbosch et al. (2014) that 'cash crops may have catalytic effects on agricultural innovations as they add value and productivity in rural areas and help develop institutions to support further growth' (2014:51).

In our interviews, we also asked our respondents how they perceived the relationship between cash and food crops, and assessed potential spillovers between the two. From our interviews with stakeholders we find ratings of the proposition 'Cash crop production negatively affects stakeholders neighbouring the production site (workers, communities, landscapes)' varying between 3 and 7. Most respondents acknowledge that cash crop production has both positive and negative spillovers, and that the balance between the two differs from country to country and from crop to crop. Palm oil is mentioned as often having a negative impact, while coffee and cocoa can have positive environmental and social impacts, according to our respondents, particularly when cooperatives are involved.

Most respondents cite economic benefits as the main positive effect of cash crops. Cash crops can be instrumental in earning foreign exchange for the national economy, and providing cash income and employment opportunities to smallholder farmers. However, depletion of natural resources is a concern, particularly among NGOs, with one respondent claiming: 'They are killing landscapes. They are killing soils. Those big cash crops are really disastrous to the environment, for the local communities.' However, as the literature review indicates, the production of cash crops can in many cases also be done more sustainably when sustainable management practices (such as using fewer chemical inputs, using crop residues as organic soil improver, and maintaining soil cover crops) are applied.

5 Future food demand and production requirements to ensure food security: the role of public and private investment

5.1 What are expected changes in food demand?

Drivers of change in food demand

Major trends driving food demand are rapid population growth, increasing urbanisation and economic development (FAO, 2023). SSA is urbanising rapidly. In 1950, SSA's urban population share was only 11%, but it has grown from 27% to 42% over the past three decades (1990-2020; UN DESA). Southern Africa is much more urbanised than the other subregions of SSA, East Africa the least, whereas the rate of urbanisation in SSA varies per country (for instance, countries where urban population growth exceeds 4% per year include Burundi, Malawi, Uganda, Tanzania, South Sudan (all in East Africa), Chad (Central Africa) and Burkina Faso, Mali and Niger (West Africa). Urbanisation has historically increased faster than the global average and will continue to do so in the coming years. By 2035, half the population in SSA will live in urban areas.

Urbanisation is associated with a change in lifestyle with implications for what people eat and the associated demand for food. In an urban environment, women tend to work more outside home, there are longer commute times, and more eating out (on the street, in restaurants, and the like). This translates into more demand for easy and quick-to-prepare, already processed food. Coupled with income growth, the demand for more varied and differentiated food is also growing (Popkin, 1993; see Osei-Kwasi et al., 2020, for an analysis of urban food patterns in 14 African countries). Urban, more affluent consumers place greater importance on food safety and quality. As a result, food chains that seek to meet this demand must invest in pre- and post-harvest quality and safety management. Such investments often drive economies of scale and concentration in processing, logistics and retail in the food chain (e.g., Reardon et al., 2021).

Economic growth in SSA, however, lags behind other regions of the world (IMF, 2024). Large economies in the region such as Nigeria and South Africa have shown little economic growth for years. With a generally high average population growth rate, many countries are also experiencing stagnant growth in average per capita income. On balance, then, urbanisation and population growth are greater drivers of increased food demand than income growth.

Required responses of production to changes in food demand

IFPRI (2024) signals the urgency to increase the supply of nutritious foods, and to reduce its costs and prices for the consumers, in order to address micronutrient deficiencies, undernutrition and obesity in Africa. They call for nutrition-sensitive agricultural programmes, nutrition-sensitive social protection programmes, food fortification (through crop varieties and industrial ingredients) and a shift in regulations and taxes. Examples of target production sectors mentioned are animal-source foods, pulses, nuts and seeds, vegetables, fruits, and fats and oils, in addition to the more dominant cereals.

Such programmes to increase food production at the farm level will have to go hand in hand with investments in the chain to make nutrition-rich products more available and accessible in both rural and urban areas (e.g., Digal et al., 2924, or IFAD, 2024, for investment examples). This means, for example, investing in cold chains to bring fresh and minimally processed products closer to large population concentrations and building rural infrastructure to connect remote farms with the main road networks. Other public investments to support linkages between (mainly small) farms and SMEs could include warehousing, cold storage, dependable electrification, access to digital tools and water supply (see FAO, 2023, for more suggestions how to increase efficiency and the expansion of services of midstream actors – traders, processors and logistical services – that will help enable access to healthy diets).

All stakeholders interviewed foresee a future where, because of ongoing urbanisation, the demand for healthy diets as well as imported food will significantly increase. Our respondents have different perspectives on what this means for the future. Coming from an NGO angle, problems are foreseen regarding the balance between sustainability and price, as domestic consumers will tend to focus on price, creating a tension with producing healthy food in a sustainable manner. From an investment angle, an increased demand for healthy food means that there will have to be more investments in producers and processors in domestic value chains, which has proven to be a challenging area of investment. For government agencies, it means more food must be produced, at a better quality, especially for vulnerable groups like children. However, government agencies will have several objectives; promoting production increase, reaching vulnerable consumers (children, people in settlements), supporting self-reliance through homestead gardening, considering policy support for access to affordable nutrition, value chain development; ensuring policy coherence is challenging. Remarkably, animal foods (dairy, meat, eggs, fish/seafood) were hardly mentioned by our respondents, notwithstanding the importance of animal and plant-based protein in the diet of consumers.

5.2 Do non-edible export sectors receive disproportionately more attention from private investors?

According to the respondents from private and non-profit sectors, the crops to support are selected based on three broad criteria:

- *National priorities*: sectors and crops that are deemed priorities by national governments are easier to work in for our partners.
- *Market dynamics*: for investors, the structured value chains, especially for export crops, are seen as less risky and more appealing for investment. For them it is very hard to invest in domestic food crops, because of the foreign exchange risk on the loans, the lack of eligible companies to invest in (too small, too informal, too low ESG standards), and the unstructured character of many domestic food markets.
- *Vulnerability and resilience*: non-profit organisations prioritise supporting vulnerable farmers to build their resilience. This often leads to a preference for food crops, as they are essential for local food security. For instance, one respondent from an international agency emphasised the importance of food crops for vulnerable populations while still recognising the role of cash crops.

Most interviewed stakeholders recognise the reality that international support and especially impact investments often go to cash and export crops, such as coffee, cocoa and palm oil. They find it justified because these crops earn a country its foreign exchange, and provide an income opportunity for farmers. From the investors' perspective, these crops can repay the loans and investments in dollars and they are traded in the formal economy which suits the requirements of the investors.

At the same time, our respondents stressed the need for a more balanced support of both cash crops and food crops. Respondents were not very convinced of the statement 'Cash crops are more profitable than food crops, so income from cash crops is always sufficient to buy food', as indicated with a score between 2 and 6. Several interviewees state that export crops provide income to farmers, but that income is often quite low.

A much heard observation is that food crops and domestic markets would deserve more attention, as food crop production is associated with more resilience of the farm household to external shocks and to the volatility of international markets. Several respondents stated that potential negative impacts of cash crops on food security, nutritional diets and the environment need to be avoided. Also, attention was asked for crop diversification, sustainable and agroecological agricultural practices, dual purpose crops that can be sold but also serve the farmers' own diet, local value addition and employment (as opposed to exporting the raw commodities).

Most respondents note that the contradiction between food crops and export crops isn't as stark in reality: there are no smallholders who only grow crops for own consumption or only crops for marketing: most smallholder farmers do both. It is also observed that inputs meant for cash crops may find their way onto food crops, creating synergies between both.

The respondents mentioned several interesting examples of investor attention for domestic food markets: specialised investment vehicles for smaller ticket sizes (AgriFI), certain funders providing a portfolio incentive for investments in domestic food investments, early experiences with investments in agri-food SMEs (e.g., processed food), stimulating local banks and MFIs to finance domestic agri-food chains. Certain respondents challenged European development banks to invest more of their concessional capital in domestic food markets, and more fundamentally advocated against the role of international finance in shaping global food systems with negative consequences in local food markets.

5.3 Can private sector work with unstructured value chains?

Our respondents rate the proposition 'Private sector can only work with structured value chains; unstructured value chains should be left to the public sector and NGOs' with grades between 3 and 7.

Respondents generally agree that the private sector is more comfortable operating within structured value chains due to the reduced risks and clearer contractual obligations. For instance, one respondent noted that 'when the value chain is more structured, then a financial institution knows that there are contractual obligations across the value chain stakeholders that are better enforced'. Conversely, unstructured value chains present significant challenges, as they are often characterised by high uncertainty and risk. One interviewee stated, 'It's very difficult... when the value chain is totally unstructured, it is very complicated'.

Respondents stress that these difficulties vary by type of actor. Input suppliers, cooperatives, SMEs and digital platforms work more easily in unstructured value chains than off-takers in global value chains. There are some promising innovative approaches to get more private sector engagement in these markets, such as public-private partnerships, but it remains difficult for the international impact investors with whom we spoke to address local food markets. This also implies that – rather than partnerships with international impact investors – other types of alliances should be sought, e.g., with more domestic public and private sector actors who feel comfortable in these markets.

5.4 Dilemmas and learning questions

Interviewees' learning questions and dilemmas were also discussed. The learning questions vary between types of stakeholders. Overall, all respondents acknowledged that we need to find a better balance between food crops and cash crops, and that this needs to happen with a mind on sustainability (though of course this later point is more important for NGOs than for investment firms).

Respondents with an investment perspective often mentioned the challenge of channeling external investments into the domestic food market, due to the dominance of unstructured market arrangements. Loan portfolios focusing on domestic food production perform worse, and if this can be addressed there will be more investments, from larger firms, driving up productivity in Africa. At the same time, NGOs and government respondents are more committed to empowering smallholder farmers when dealing with the world market. Issues they raise include how to increase the share of the total value added that ends up with producers; how to increase the bargaining power of smallholder farmers in the food system. This bargaining power matters not only vis-à-vis large international players, but also at a more local scale, such as within cooperatives with richer and poorer members.

6 Conclusions and recommendations

This final chapter summarises the conclusions for the respective research questions in a very concise manner, and then derives some recommendations for SSNUP in Sub-Saharan Africa.

Research questions		Conclusion
1.	What are the main types of crop/livestock produced, consumed, exported, imported, and stocked in national food reserves?	There is large variation across Africa, between sub-regions and countries. We do see a slight shift in consumption patterns to imported cereals (such a rice) and (animal) protein.
2.	Does Africa produce enough food, or instead, is inadequate food distribution or food loss/waste due to lack of post-harvest infrastructure the leading cause of food insecurity?	Africa is increasingly reliant on imported food; whether that means Africa should produce more food is a normative question. Our respondents mostly agreed that food production needs to improve, and food losses need to be reduced. However, though the FAOSTAT data showed a correlation between increased food loss and increased food insecurity, it is important to emphasise that the primary causes of food insecurity in SSA include a series of factors among which weak economic growth, gender inequality, low agricultural productivity and poor policy and regulatory frameworks.
3.	Were there situations when countries had difficulties filling their national food reserves due to drops in national production? Do those adverse situations happen more permanently than before?	We identify many situations where national food supply decreases, and these seem to be correlated with drops in national production. The duration and severity of these adverse events had been declining, until the 2010s, since then they increased.
4.	Are those adverse situations more prevalent in regions/countries highly specialised in food production rather than in regions/countries highly specialised in non-edible/cash/export food production, and vice versa?	There appears to be no clear link between specialisation in export crops and the incidence of adverse food supply events.
5.	Does the production of non-edible/cash/export food lead to the depletion of natural resources, reduction of local food availability, food insecurity, biodiversity loss, reduction in resilience, overdependency on big agro-industry players, and decrease in livelihoods of smallholder farmers?	Interviews and literature review do show cases where the production of non-edible/cash/export crops does negatively impact the environment and smallholders. Environmental damages can be limited by integrated and sustainable management farming practices that can also achieve high yields. There is evidence of unequal distribution of gains in both export-oriented and domestic value chains, with small-scale farmers with little assets and agency (e.g., network and market linkages) being most vulnerable. Business initiatives that empower farmers (e.g., in associations or cooperatives) share benefits of trade more equally among farmers and across value chain actors.
6.	Does non-edible/cash/export food production have spillover effects on other food production, contribute to food security, nutrition, biodiversity, farmers' resilience, and, more broadly, sustainable agriculture?	Interventions to increase cash crops (inputs, training) can positively affect food production. Positive spillovers are mostly associated with economic effects, whereas the negative spillovers are mostly environmental. However, the share of the value added that ends up with farmers is low, limiting the potential positive spillovers. Moreover, earnings from cash crops are no different from food crops: they often generate a low return and a risky livelihood to farmers.
7.	What are the expected changes in future demand for food for a healthy diet and the requirement for future production to meet this demand at local, regional, and continental levels? This will shed light on the types of crops/livestock to support.	Making food investment nutrition-sensitive – both on the supply and consumer demand side - should target sectors such as animal-source foods, pulses, nuts and seeds, vegetables, fruits, and fats and oils, in addition to the more dominant cereals. Investments in more efficient food chains that also take into account food quality and safety are essential to improve the availability and affordability of healthy diets.
8.	Do public and private sectors investment strategies show that non-edible/cash/export food production or more structured value chains disproportionately attract more attention from private investors and whether food production or unstructured value chains are more of a public sector focus for food sovereignty?	International support and especially impact investments often go to cash and export crops, such as coffee, cocoa and palm oil, or to structured domestic value chains. Interviewees advocate for a more balanced attention for food crops, domestic markets and rural households' food and nutrition security. This may require partnerships with more domestic actors who feel comfortable in these markets. Challenges are to develop investment propositions tailored to smaller structured segments in the domestic market; and to develop effective ways to reach the dominant unstructured section of the domestic market.

Recommendations for SSNUP strategy

SSNUP can benefit from the above conclusions in shaping its program-funded agri-food interventions in Sub-Saharan Africa. The following recommendations emerge:

a. A more *balanced attention* is advisable in SSNUP's project portfolio, regarding food crops, domestic markets and rural households' food and nutrition security.
b. Given the food and nutrition security goals in the field programs funded through SSNUP, it is important to deploy a *deliberate programme strategy* to achieve food and nutrition security. This requires paying equal attention to the sustained availability, accessibility and healthy utilisation of food, both for the rural and urban poor, and across genders and ages.
c. The choice between supporting *food or cash crops* as such is not decisive for the food and security outcomes of a program intervention. It is a *complex of variables* that affect both the supply and demand of food that need to be considered in order to achieve effective FNS strategies in a certain country or local context.
d. To achieve the goals of a nutritious and healthy diet in the Sub-Saharan African context, SSNUP can focus more investments into the *diversification of crops and diets* beyond the currently dominant cereals. Examples are animal-sourced foods, pulses, nuts and seeds, vegetables, fruits, and fats and oils for domestic use. This requires integrated interventions – financial and non-financial - in the respective value chains and food systems, from *farm to fork*.
e. SSNUP can also contribute to FNS by making investments in *food processing and local value addition*, as long as food items associated with obesity and other nutrition-related diseases are avoided.
f. For *very vulnerable households*, access to food and resilience to shocks and stressors may be more important elements than the production of food as such.
g. Programme interventions – both in cash and food crops - should be checked against *risks for negative spillovers*, such as environmental effects (nature, biodiversity, overexploitation/pollution of land & water resources) and social effects (in-/exclusion, equal distribution of benefits, effects on surrounding communities).
h. Where SSNUP brings in *concessional capital funds or guarantees* (e.g., Wattel et al., 2024 for examples) in its partnerships with impact investors, it can stimulate a more balanced attention for food crops and domestic markets, for example with certain *portfolio quota and corresponding bonuses*.
i. SSNUP may need to engage in *partnerships with more domestic actors* who feel comfortable in domestic food markets.

Suggestions for SSNUP's operational project implementation[13]

If the SSNUP wants to have a more meaningful impact on the food and nutrition security situation in the country support projects are in action, the programme will have to formulate objectives and organise its monitoring and evaluation accordingly. We make a number of suggestions that can help to focus the outcomes of the supported projects more on the consequences for food and nutrition security of SSA stakeholders involved. By asking the following questions a virtuous circle around FNS can be created in each project:

a. *FNS dialogue*
   Make FNS a topic in the dialogue around the project, between ADA – investor – project, but also between different stakeholders within the project. What is the most suitable and effective way for such a dialogue?
b. *FNS knowledge and awareness*
   To what extent is household food insecurity an issue in or around the project (among farmers, among workers, among MSME providers, among surrounding communities)? How does that show from available figures in the area about undernourishment, the 7 health-related indicators for malnutrition and the food insecurity experience (FIES)?[14] Which types of households and target groups (m/f/y) does this affect most?

[13] Building on the conclusions of this study, and further inspired by Freudenreich et al. (2020) and Sharma et al. (2021).

[14] The prevalence of undernourishment is SDG indicator 2.1.1. The prevalence of moderate or severe food insecurity, based on the Food Insecurity Experience Scale (FIES) is SDG indicator 2.1.2. The seven global nutrition targets (related to SDG 2.2 on malnutrition) are partly related to undernutrition (child stunting, child wasting, low birth weight, rate/prevalence of exclusive breastfeeding, anemia among women), and partly to overnutrition (child overweight, prevalence of adult obesity). See FAO et al. (2024) for global trend analyses on these indicators.

c. *Possible effects on FNS*
   How could the project be affecting the vulnerable households/ target groups and FNS indicators, both positively and negatively? Which of these effects may have most impact (+/-)?
d. *Positive contributions to FNS*
   How could/should the project make positive contributions to the vulnerable households and FNS indicators ? (think equally about the four pillars of FNS: availability of, access to and utilisation of food, and the stability of these three)
e. *MEL*
   How can the project track progress and impact on the FNS-related indicators and target groups? And learn from this to adjust its approach, if needed?

Questions to ask about positive FNS contributions of a project (examples)

1. *Gender and age*
   Are women – and female-headed households - equally participating and benefiting, throughout the project? And what about elderly and youth?
2. *Self-production*
   Are mechanisms in place to stimulate households' own production of key food crops (not only staples (calories), but also nutrient-rich crops (protein, vitamins, minerals, fibres, such as fruits/vegetables, legumes, eggs, milk/cheese, meat/fish).
3. *Healthy diets*
   Are mechanisms in place to stimulate healthy diets (e.g., assess against impact on Household dietary diversity score; Affordability of healthy diet)?
4. *Resilience*
   Are mechanisms in place to enhance resilience against shocks and stressors? (e.g., climate-smart agricultural practices, other climate adaptation practices, regenerative agricultural practices, social protection, asset building, savings and insurance, social organisation, women empowerment)
5. *Environmental issues*
   Are mechanisms in place to avoid or repair negative environmental effects and unsustainable agricultural practices?
6. *Contracts*
   Are contracts between farmers and off-takers transparent and fair? And the worker contracts? To what extent are living wages and living incomes taken into account when fixing the prices and wages?
7. *Processed food*
   Are the agricultural products processed into food products that contribute to obesity or other nutrition-related diseases? (e.g., high fat/sugar/salt content, ultra-processed food, alcohol and tobacco)? (e.g., high fat/sugar/salt content, ultra-processed food, alcohol and tobacco).

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Appendix 1 Methods for literature search

For literature used in Chapter 4. Keyword searches on databases:

For articles and review articles on Scopus:
TITLE-ABS-KEY (((“trade-off” OR “trade-offs” OR tradeoff* OR “trading off”) AND ((food* OR agriculture*) AND (cash crop* OR export crop*))) AND PUBYEAR > 2015

For articles on Google Scholar:
(“trade-off” OR “trade-offs” OR tradeoff* OR “trading off”) AND food AND agriculture AND cash crops AND export crops (most relevant results shown first).

A first screening of the list of references was to remove duplicates, followed by a screening on relevancy that was based on the title only. A third step in the screening process was on eligibility, based on the title and abstract. Reasons for exclusion were: no reference to food or agricultural production, focus on high-income countries or China (mainly). The final list of references was limited to studies that explicitly discuss trade-offs of producing cash crops between different component or outcome of food systemss, excluding studies that focus only one on narrow dimension, e.g., ecology or water intervention.

Manual search
We also included gray literature that we were aware of, such as working papers and reports on food systems trade-offs prepared by the CGIAIR network (in which Wageningen research actively participates).

For recent articles, we also examined the reference list in the relevant articles for cited references, especially for recent articles.

Finally, we conducted a citing reference search to locate studies or articles that point to a relevant article in the existing list of references.

Appendix 2 Interview guide for stakeholders

1. **INTRODUCTION**
2. **INTERNAL RESPONSIBILITIES**
   - Who/which department in your organisation handles the matters of food security resp private sector development?
   - Is there an official policy regarding this topic?
3. **CHOICE OF CROPS / VALUE CHAINS**
   - Which sectors, crops and/or value chain do you target? Why?
   - Who are your main beneficiaries? Why?
   - Are there differences between the answers above for food security and private sector development? What are the reasons behind these differences?
4. **FIVE DISCUSSION STATEMENTS**

Can you score each of the following statement with a score between 1 (strongly disagree) and 10 (strongly agree) and motivate your answer:

   a. Africa produces enough food.
   b. Investing in cash crops for export revenues and high-end markets is a promising strategy for agricultural development.
   c. Private sector can only work with structured value chains; unstructured value chains should be left to the public sector and NGOs.
   d. Cash crop production negatively affects stakeholders neighboring the production site (workers, communities, landscapes).
   e. Cash crops are more profitable than food crops, so income from cash crops is always sufficient to buy food

5. **LEARNING QUESTIONS AND DILEMMAS**
   - What are your own learning questions regarding the trade-offs and synergies between food and non-food production?
   - How does your organisation expect demand for food for a healthy diet to change in the future? What does this imply for future production to meet this demand at local, regional, and continental levels?
6. **FINAL QUESTIONS**
   - What documents (policy/strategy, report) of your organisation should we read?
   - Any other topic you would like to bring in?
   - Any question you would like to ask to us?

THANK YOU!

Appendix 3 Profiles of the 10 organisations surveyed

Stakeholder perspectives were obtained from 10 organisations through a structured, and from an interview with five of those. The 10 organisations present a fair balance between the public sector, development investors and NGOs, and provide a variety of perspectives. Some of the organisations usually partner with larger agri-food companies, whereas others are more involved with cooperatives, social organisations or local SMEs. A limitation is that they all represent international actors, rather than actors from Africa itself.

We finally interviewed six organisations, basically the ones that agreed to be interviewed on our subject. The 10 surveyed organisations are the following:

- Governmental
  - IFAD (interviewed)
  - SDC
  - CASA
- Development Finance Institutions (DFIs) and investors
  - ABC Capital Find (interviewed)
  - ACELI
  - Incofin (interviewed)
  - FMO (interviewed)
- Nongovernmental organisations (NGOs)
  - Humundi (interviewed)
  - Agriterra (interviewed)
  - IDH (interviewed)

The information contained in the profiles originates from public sources, including websites, policy documents and published reports. The profiles were validated with the respective interviewees or persons contacted.

IFAD

Organisation	**IFAD**	Type of organisation	Multilateral development institution under the United Nations.
HQ country	Italy	Type of project support	Low interest loans and grants
Countries of operation	World wide	Sector	smallholder farmers, rural development, and climate resilience.
Size	Over 600 people	Size of projects	Up to $350 million
Type of clients	Works with multilateral institutions like the European Investment Bank (EIB), national governments, civil society, and other UN agencies.		
Crop sectors financed	A broad array of crops, with a focus on those that enhance food security, including staple crops and those that promote rural livelihoods.		
End beneficiaries	Smallholder farmers and rural communities		
Vision on food security	IFAD emphasises building climate-resilient agricultural systems and empowering rural populations to sustainably manage resources.		
Key documents used	• https://www.ifad.org/en/ • IFAD annual reports		

SDC

Organisation	**SDC**	Type of organisation	Government agency
HQ country	Switzerland	Type of project support	Co-funding, Technical assistance, market transformation
Countries of operation	SDC is active in Africa, Asia, Eastern Europe, Latin America, and the MENA region.	Sector	SDC works across sectors such as climate change, food security, water, migration, and health, with a strong focus on poverty reduction and sustainable development
Size		Size of projects	Varies
Type of clients/patners	Local and international NGOs, government institutions		
Crop sectors financed	Focus on diverse crops, specific to local agro-ecology		
End beneficiaries	Smallholder farmers		
Vision on food security	SDC views food security through a lens of sustainability and resilience, aiming to help communities cope with environmental and socio-economic challenges while ensuring stable access to food supplies. They support agricultural projects that focus primarily on improving local food security rather than promoting export-oriented cash crop production. Their projects emphasise sustainable agricultural practices, such as agroecology		
Key documents used	• https://www.sdc-foodsystems.ch/en		

CASA

Organisation	**CASA**	Type of organisation	Development Programme funded by the UK's Foreign, Commonwealth & Development Office (FCDO)
HQ country	UK	Type of project support	grants and technical assistance
Countries of operation	23 countries across Africa and Asia	Sector	Agribusinesses
Size	Over £6.6 million in leveraged investments through its Technical Assistance Facility. Supported 115,000 smallholder farmers through agribusinesses in more than 20 value chains.	Size of projects	Varies
Type of partners	Agribusiness, DFIs, private investors		
Crop sectors financed	Focus mostly on food crops		
End beneficiaries	Smallholder farmers		
Vision on food security	CASA aims to enhance food and nutrition security by empowering smallholder farmers, particularly women, through inclusive supply chains and sustainable agricultural practices.		
Key documents used	• https://casaprogramme.com/		

ABC Fund (managed by Bamboo Capital Partners)

Organisation	**Agri-Business Capital Fund (ABC Fund), managed by Bamboo Capital Partners**	Type of organisation	**Impact asset manager**
HQ country	Luxembourg	Type of project support	Loans Equity Investments
Countries of operation	30 countries[15]	Sector	Agribusinesses
Size	20 fte Portfolio ABC Fund: • € 55.6m in total financing disbursed in the period 2019-2023, into 33 investees.	Size of projects	Ticket sizes ranging from €200K (agri-SMEs) up to €4m (financial intermediaries). Average ticket sizes of ABC Fund around €1.2m (cooperatives) and €1.6/1.7m (financial intermediaries and agri-SMEs respectively) in 2023.
Type of clients	Three types of clients: • Farmer organisations and cooperatives • Agri-SMEs • Financial intermediaries active in agriculture		
Crop sectors financed	ABC Fund finances in two different ways: • Through financial intermediaries (50-60%), smallholder producers of various value chains (rice, fruits & vegetables, dairy, others) • Directly into agricultural SME and farmer cooperatives (40-50%): cocoa, coffee, mango, shea, cashew, macadamia, pineapple juice, animal feed, grains & seeds, poultry, other food products		
End beneficiaries	Smallholder farmers		
Vision on food security	The ABC Fund is a blended finance impact fund which deploys investments into farmer organisations, rural agri-SMEs, and financial intermediaries active in agriculture, to support sustainable food ecosystems and improve the livelihoods of smallholder farmers. ABC Fund provides both financing and technical assistance, focusing on underfinanced but profitable segments of agri-value chains. This combined approach helps strengthen the capacities of agri-value chain players and supports revenue-generating activities, ultimately reinforcing food security in rural areas. The fund prioritises businesses that practice climate-smart agriculture and sustainable production, emphasising support for women and youth. This approach improves the livelihoods of thousands in rural communities by creating employment opportunities and enhancing food security.		
Key documents used	• ABC Fund's Impact Report 2023 • Bamboo Capital Partners - Impact Report 2022 • Bamboo's website • Website ABC Fund (https://www.agri-business-capital.com/about.html)		

[15] Bamboo Capital Partners invests in 30 countries in Africa, Asia, Latin America & Caribbean, and Europe. The ABC fund has investments in Mali, Benin, Cote d'Ivoire, Burkina Faso, Ghana, Kenya, Uganda, Nigeria, Senegal, Bolivia, Colombia and Ecuador.

ACELI

Organisation	**Aceli**	Type of organisation	'Market catalyst'
HQ country	Kenya	Type of project support	Financial incentives to lenders, reducing the risks and costs associated with lending to these businesses
Countries of operation	Kenya, Tanzania, Rwanda, and Uganda	Sector	Agri-SMEs that enhance food security, promote gender inclusion, support climate-resilient practices, and create opportunities for underserved communities, particularly women and youth
Size	Over 173 million in loans.	Size of projects	$25,000 - $500,00
Type of clients	Agri SMEs, through financial institutions		
Crop sectors financed	Aceli is active in all agricultural sectors except for tobacco and other sectors listed in the IFC exclusions list. Aceli's portfolio includes both formal value chains (those with structured markets, transactions in foreign exchange, lower perishability, and reduced susceptibility to climate change) and informal value chains (those with unstructured markets, domestic sales, high perishability, and greater vulnerability to climate change). Currently, informal value chains comprise 72% of Aceli's portfolio. To address their higher risk profile, Aceli haz designed their incentives to provide larger rewards to lenders for loans in these unstructured value chains.		
End beneficiaries	Smallholder farmers		
Vision on food security	We aim to catalyze lending to SMEs that contribute to food security and nutrition. Our target is for at least 50% of the loans in our portfolio to meet food security and nutrition criteria. The Aceli food security criteria assess businesses across the entire value chain, including input suppliers, primary producers, aggregators, and processors. Each SME must meet specific thresholds outlined in the criteria before a loan can be confirmed as a food security loan.		
Key documents used	• Aceli Website • Aceli Africa Year 3 Learning Report • Aceli's ESG & impact policy summary		

INCOFIN

Organisation	**Incofin**	Type of organisation	Impact investment manager
HQ country	Belgium	Type of project support	Debt Investments Equity Investments Technical Assistance
Countries of operation	Africa, Eastern Europe and Central Asia, South East Asia, Latin America and the Caribbean	Sector	Inclusive Finance, Drinking Water, Sustainable agriculture and Nutritious Food
Size	• USD 1.3bn of Assets Under Management	Size of projects	Average ticket size USD 2m
Type of clients	Two active debt portfolios in Africa: 1. Financial institutions (microfinance) 2. Sustainable agriculture (exporting SMEs and coops) and Nutritious Food (N3F)[16] (food processing SMEs for domestic markets)		
Crop sectors financed	• Sustainable agriculture: mainly export cash crops (cocoa, coffee, cashew and macadamia) • Nutritious Food Financing Facility (N3F): processed foods for domestic markets (e.g., fortified flours from maize and wheat, fish)		
End beneficiaries	1. Financial institutions > micro entrepreneurs and SMEs 2. Sustainable agriculture > Small Holder Farmers 3. Nutritious food (N3F) > BoP consumers in LMICs *(impact indicator: # nutritious food servings consumed by low income consumers)*		
Vision on food security	'Agriculture sits at the nexus of many of the core challenges and opportunities facing our world today. From poverty alleviation and women's leadership to climate adaptation and resilience, Incofin´s agriculture and food funds are deeply impactful funds. These funds aim to catalyze positive change by committing to improving the well-being of rural and lower-income communities and advancing our core mission of driving inclusive progress across sustainable transitions.' (Impact Report 2024).		
Key documents used	• Incofin 2024, Impact Report 2024 • Incofin website		

[16] The N3F fund was established as a blended finance fund in Dec 2023 and made its first three investments in 2024. N3F is a joint initiative of Incofin and GAIN (Global Alliance for Improved Nutrition). The main share of its initial junior capital was provided by bilateral donors (SDC, USAID). The ambition is to leverage senior capital from impact investors.

FMO

Organisation	**FMO Entrepreneurial Development Bank**	Type of organisation	Development Finance Institution
HQ country	Netherlands	Type of project support	Loans Equity Investments
Countries of operation	55 countries in four continents[17]	Sector	Agribusiness, Food & Water
Size	800 employees €7.2bn outstanding portfolio (2023)	Size of projects	>EUR 5-10m per project
Type of clients	'We invest in global merchants, input providers, and food companies, with a strong commitment to ESG principles'. (FMO Annual Report 2023)		
Crop sectors financed	Mainly cash crops for export, through value chain companies. In addition, agri inputs and animal proteins (especially aquaculture, poultry and dairy).		
End beneficiaries	'We invest in companies that support smallholder farmers to improve their yields, and/or reduce environmental degradation, and/or improve social practices during the investment period.' (FMO Annual Report 2023)		
Vision on food security	**'Accelerating sustainable and resilient agricultural supply chains to increase food security** We invest in agribusiness, food and water to support and accelerate sustainable and resilient agricultural supply chains to increase food security. More than 800 million people currently face hunger, and an even greater number of people lack access to nutritious foods. This number is expected to rise due to the current food crisis resulting from the effects of climate change and geopolitical tensions. Improving access to food is crucial for reducing inequality, which requires higher economic development in rural areas and more investments throughout the agricultural supply chains. In addition, there is a need to transform the sector through sustainable, resource-efficient and resilient practices. The effect from climate change on food production and the contribution of the agriculture sector on rising GHG emissions, underscores the urgency of these measures. **Towards 2030** In line with our Strategy 2030, we seek to support sustainable and resilient agricultural practices throughout the agricultural and food supply chain. We also aim to enable local agricultural and food supply chains to increase production and improve local access to food, while reducing food waste and reliance on imports. Furthermore, we want to grow the number and quality of jobs supported, focusing on decent work and inclusion of smallholders and women in supply chains. To achieve these ambitions, we are investing in global merchants, input providers, and food companies to increase sustainable practices along the (international) agricultural supply chain. In addition, we continue to expand our integral landscape approach to sustainable land-use and ecosystem protection and restoration. We do this through our work in forestry, climate-smart and regenerative agriculture, soil improvements, and improved livelihoods. Towards 2030, we will also increase our engagement with customers, helping them improve the resilience of their supply chains and aligning with the goals of the Paris Agreement.' (FMO Annual Report 2023)		
Key documents used	• FMO Annual Report 2023 • FMO website		

[17] FMO invests in multiple countries in Africa, Asia, Latin America & Caribbean, and Europe & Central Asia.

HUMUNDI

Organisation	**Humundi (formerly SOS Faim)**	Type of organisation	NGO
HQ country	Belgium	Type of project support	Grants
Countries of operation	9 countries in Africa and Latin America[18]	Sector	Family farms, agro-ecological transition, sustainable and inclusive food systems
Size		Size of projects	EUR 71,500 per partner per year
Type of partners	Farmer organisations, NGOs, rural microfinance institutions, advocacy platforms		
End beneficiaries	Family farms in general, including a special focus on women and youth.		
Organisation's strategy for agri-food	Humundi's renew mission (2022-2026) is to promote and accompany the agro-ecological transition necessary to build Sustainable Food Systems (SFS). In general, Humundi supports family farms and farmers' economic activities, as well as a variety of initiatives for sustainable and inclusive food systems (a.o. community cereal banks, agroecological transition, rural microfinance, multi-actor territorial development processes, access to ICT, advocacy for above topics).		
Crop sectors financed	Most of Humundi's projects support food crops and farmers' position in domestic food markets (e.g., cereals such as rice/ fonio/ niébé/ quinoa, chick pea, beans, vegetable garden products such as potato/onion). At the same time, various projects also aim at strengthening family farm's position in typical cash crop markets (e.g., coffee, cocoa, sesame, cotton) and off-farm activities (crafts, agro-processing).		
Vision on food security	Humundi strives to attain an inclusive food security and to reinforce the resilience of rural communities, especially youth and women. Over the last few decades it has been aiming at family farms, because 2/3 of food insecure households are smallholder farmers. In its renewed strategy (2022-2026), Humundi broadens its vision on sustainable food systems change, with the agroecological transition – in technical, social and politicial terms - as its centerpiece.		
Key documents used	• SOS Faim (2021), Strategic Plan 2022-2026, version 18 March 2021 • Humundi (2023), Position paper Agroecology, May 2023 • Humundi (2024) Financement de l'agriculture et soutien à la finance rurale inclusive, May 2024.		

[18] Humundi support projects in Africa (Senegal, Mali, Burkina Faso, Ethiopia, Uganda, Congo DRC) and the Andes region (Peru, Bolivia).

AGRITERRA

Organisation	**Agriterra**	Type of organisation	NGO (founded by Dutch farmers' organisations)
HQ country	The Netherlands	Type of project support	Grants
Countries of operation	13 countries in Africa and Asia[19]	Sector	Agri-food cooperatives
Size	220 fte (2023) Total budget € 17m (2023)	Size of projects	EUR 12,750/ EUR 31,900 per partner per year (direct partner expenses resp total expenses)
Type of partners	Farmer cooperatives in developing countries (497 in 2023)		
End beneficiaries	Farmers (men, women, youth)		
Crop sectors financed	Top commodities supported worldwide: Maize, coffee, potato, dairy, rice, cacao.		
	Africa: • West Africa: maize, cacao, onion, tomato, sheanut • East Africa: dairy, coffee, maize, avocado • Great Lakes: coffee, potato, maize, dairy, rice, amaranth, poultry, maracouja	Asia: Cassava, coffee, dairy, maize, rice	
Vision on food security	'…. developing countries … move … from rural societies based on subsistence agricultural sector which employs the majority of the population, towards manufacturing and services-oriented societies with rising levels of productivity, income and welfare. Transformation always implies a shift of people working in agriculture to other economic sectors. Therefore, how the structural transformation evolves has long lasting effects on society. Without a balanced reassignment of agricultural resources, the structural transformation process can degenerate into rural exodus and depopulation, severe income inequalities among urban centres and the periphery, unsustainable urban massification, increasing urban unemployment and its side effects (crime, domestic violence, pollution), growing ecological and environmental threats derived from urban congestion and neglected rural areas, and food insecurity, hunger and malnutrition. These powerful unbalancing forces often witnessed in structural transformations can be counterbalanced with a vibrant rural sector in which agricultural activity, the agroindustry and agri-services play a leading role to generate employment (on-farm and off-farm jobs) and economic growth in rural areas, raise productivity and living standards for rural dwellers, and create public and political awareness about the rural sector. As a result, a vibrant rural sector in developing countries alleviates social inequality, hunger, and poverty, and enables young people to secure off-farm employment in the villages close to their families' farms.' (Route 2030)		
Key documents used	• Agriterra Annual Report 2023 • Route 2030 – Agriterra's strategy 2021-2030 • Agriterra website		

[19] Agriterra support projects in 13 countries, through country offices in West Africa (Ivory Coast, Ghana, Burkina Faso), East Africa (Ethiopia, Tanzania, Kenya), the Great Lakes region (Uganda, Rwanda, Congo DRC, Burundi) and Asia (Vietnam, Indonesia, The Philippines).

IDH (Initiative Sustainable Trade)

Organisation	**IDH**	Type of organisation	NGO, public-private partnership
HQ country	Netherlands	Type of project support	Co-funding, Technical assistance, market transformation
Countries of operation	Worldwide	Sector	Sustainable trade, in sectors like agriculture, forestry, and textiles
Size	IDH has facilitated over €300 million in public and private investments, impacting over 4.3 million farmers and workers.	Size of projects	$25,000 - $500,000
Type of clients	IDH works with governments, private companies (often large multinational companies such as Unilever) and civil society organisations.		
Crop sectors financed	Traditionally, IDH has focused on value chains such as cocoa, coffee, palm oil, tea, soy, and cotton. However,		
End beneficiaries	Smallholder farmers, agricultural workers, and rural communities who are integrated into more sustainable and equitable value chains.		
Vision on food security	IDH envisions a future where sustainable agricultural practices help increase productivity, reduce environmental impact, and ensure equitable market access for smallholders and other vulnerable groups.		
Key documents used	Annual Report 2023 IDH Website		

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The mission of Wageningen University & Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 7,700 employees (7,000 fte), 2,500 PhD and EngD candidates, 13,100 students and over 150,000 participants to WUR's Life Long Learning, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.