TABLE Report

Investment, Power and Protein in sub-Saharan Africa

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TABLE

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Cover

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TABLE

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1. Introduction

This report examines financial investment in protein production in sub-Saharan Africa. This includes investment in a) animal products such as meat, fish, eggs and dairy products; b) crops containing high concentrations of protein such as beans, pulses and legumes; and c) processed 'alternative protein' products whose ingredients are derived from plants, insects, micro-organisms or animal cells grown as part of a tissue culture. Through analysing investment by state, philanthropic and private sector organisations – as well as multilateral financial institutions such as development banks – it aims to establish which actors invest in various types of protein production in sub-Saharan Africa, and to investigate which protein sources and stages of the value chain they finance.

In so doing, the report explores what sorts of protein production and provisioning systems are being brought into being in sub-Saharan Africa using the funding provided by different groups of investors – and what alternative possibilities might be being marginalised due to a lack of investment. It thus seeks to understand what might be attracting investment to particular protein production systems, groups of enterprises and locations within sub-Saharan Africa, and whose priorities, preferences and visions for the future of food might be informing the changing place of protein in sub-Saharan African diets, economies and food systems.

This research forms part of TABLE's work theme on "Power in the food system: what's powering the future of protein?", which uses protein as a case study through which to explore debates about power in the food system. This work theme examines governmental, geopolitical, and corporate power alongside the influence of its less tangible manifestations – such as cultural, moral, or educational norms – on how stakeholders think about food and what they want for the food system.

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This project responds to the work theme's priorities by examining what motivates the stakeholders who have the power to grant or deny finance to particular forms of protein production, and thus to shape sub-Saharan African food systems. To this end it investigates what values, visions and expectations about the future of food influence investors' decisions about where to invest their capital.

This report begins by reviewing publicly available reports and statistics in order to assess which actors provide the largest quantities of finance to support protein production in sub-Saharan Africa. Based on the findings of this review, the author conducted nineteen expert interviews with representatives of organisations identified as key funders of protein production in sub-Saharan Africa and with other individuals who had longstanding professional links with important groups of investors. These interviews provided insight into the investment decision-making processes of key funders of protein production in this region and into the normative goals, values and expectations about the future of African diets and food systems which shaped their investment priorities. In so doing, they explored why the patterns of investment in protein production identified through the initial desk review had emerged and what sorts of future food systems they might be intended to create across sub-Saharan Africa. This research report aims to answer four questions:

1. Who is currently investing in protein production in sub-Saharan Africa (including meat, egg and dairy production, aquaculture, the cultivation of protein crops such as legumes, animal feed production and alternative protein production)?
2. What goals do these investors aim to achieve (or what sort of future do they seek to bring about) through making these investments?
3. Which protein sources and protein production systems do they finance?
4. What theory of change links their investment strategy to these goals?

Following this short introduction, Chapter 2 establishes the context for the research on which this report is based. It outlines the rationale for this report's focus on protein, examines protein's changing place in sub-Saharan African diets and food systems and introduces research which approaches these issues through the

concept of 'nutritional transitions'. Chapter 3 briefly describes the methodology of the research on which this report is based, while Chapter 4 presents the results of the desktop research conducted during the first phase of this project and identifies the major sources of investment in protein production in sub-Saharan Africa. Chapter 5 then presents the findings of interviews both with representatives of organisations which invest directly in protein production in sub-Saharan Africa and with other relevant experts. It identifies three distinct networks of investors, outlines the contrasting goals and values which shape each investor network's decisions about which forms of protein production to finance, and discusses which countries, livestock species and sections of protein value chains form the focus of their investments. Chapter 6 sets the research presented in this report in the broader context of global flows of agricultural finance, and reflects on its limitations, through examining the role of government subsidies to livestock producers elsewhere in the world in shaping international trade in meat and dairy products and thus the development of sub-Saharan Africa's food system. Finally, Chapter 7 provides a short conclusion which summarises the project's main findings and outlines possible directions for future research.

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2. Background

Summary

- Average per capita consumption of protein, and especially animal protein, is low across most of sub-Saharan Africa and many countries within the region experience high rates of food insecurity and undernourishment. In most sub-Saharan African countries animal protein is produced mainly by pastoralists and smallholder farmers. Large-scale intensive livestock agriculture accounts for a small proportion of protein production.
- Animal protein production has recently grown rapidly across much of sub-Saharan Africa. Production of whole milk, beef, sheep meat and eggs across the region roughly doubled between 1990 and 2020, while chicken and pork production has trebled. However, the region's population has also grown rapidly. As a result, increased animal protein production has not significantly changed average per capita protein consumption.
- Continued population growth, increases in GDP per capita and rapid urbanisation are forecast to transform dietary patterns across sub-Saharan Africa over the coming decades. As part of this 'nutritional transition', per capita consumption of protein (and specifically animal protein) within the region is expected grow faster than production. This has led to concern in some quarters that that protein production per capita may decrease over time (and dependence on imported proteins may increase), limiting nutritional gains unless domestic protein production expands significantly.
- However, growing awareness of the environmental impacts of livestock production has raised questions about the sustainability of further expanding animal protein production and consumption across the Global South. Sales of alternative proteins have also grown in the Global North and concomitant modest decreases in the quantity of animal products consumed per capita have occurred in countries such as the UK.
- Some scholars therefore suggest that the world may be beginning a new nutritional transition in which per capita consumption of animal protein declines from its current levels and the share of dietary protein supplied by plant-based (and other) alternatives increases. This raises questions about whether sub-Saharan Africa will continue to experience rising rates of animal product consumption as GDP per capita increases, or whether this will be superseded by an accelerated transition towards plant and alternative proteins.
- This report argues that in order to understand these ongoing nutritional transitions, it is important to investigate what motivates different financial actors to invest in new food products, markets and value chains – or to withhold investment from them. It therefore examines what role investors' expectations about the future of protein in sub-Saharan Africa play in mobilising investment in some places, protein sources and value chains – and in deterring investment in others.

Why Protein?

Almost all foods contain some protein, but as a dietary category the term 'proteins' tends to be used to describe foods which are particularly rich in this macronutrient as a percentage of their overall energy content. These

'protein' foods may originate from animals (for instance in the form of meat, fish, eggs and dairy products) or from plants (including beans, pulses, legumes, and derivatives of such crops such as tofu, tempeh, and soy milk). More recently, these familiar categories of 'protein' foods have been joined by processed 'alternative protein' products designed to resemble meat, fish, eggs and dairy products, which may be derived from plant-originated ingredients, from insects, from micro-organisms such as fungi, algae and bacteria, or from animal cells grown as part of a tissue culture. However, for reasons of affordability and accessibility, much of the dietary protein consumed by many people in sub-Saharan Africa comes from foods (including wheat, maize, sorghum and millet) which nutritionists typically classify as 'carbohydrates'. Since these foods constitute the bulk of many people's overall diets, they also contribute the majority of their dietary protein intake.

Protein has been a nutrient of particular interest, and its place in the diets of citizens of nations in the Global South a matter of concern, to international development actors at least since the establishment of organisations such as the UN Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) in the 1940s and 1950s. Influenced by research carried out by colonial governments during the early 20th century, to which many of their early leaders had contributed, these organisations quickly identified that on average citizens of many Asian and African countries consumed less protein – and specifically smaller quantities of animal products – than did European and North American populations. These organisations presumed that this difference indicated that African, South Asian and Latin American diets were deficient in protein in comparison to those which prevailed in the Global North, and arguing that this 'lack' of protein was implicated in conditions such as kwashiorkor[1]. They therefore claimed that malnutrition in the Global South reflected a global 'protein gap' and that too little protein was being produced to ensure the good health of much of the world's population. As a result they sought to increase protein consumption among these populations through measures ranging from investment in dairy production in Africa to the development of novel protein supplements based on peanuts, soybeans, fungi and even cottonseed (Blaxter and Garnett, 2022).

By the 1970s the estimates of dietary protein requirements which underpinned these programmes, and the existence of a global 'protein gap', were being questioned openly. During this period some critics described nutritional scientists' and international development practitioners' emphasis during the 1950s and 1960s on increasing protein production and consumption as a 'great protein fiasco' (Kimura, 2013). In more recent decades official recommended daily protein consumption guidelines for children have been reduced significantly. Meanwhile, WHO and FAO nutritional guidance has shifted away from viewing insufficient consumption of 'protein' in general as a direct cause of malnutrition and delayed growth in children to place greater emphasis on protein-energy malnutrition and on deficiencies in specific amino acids (IPES-Food, 2022). However, as will become clear in this report, anxieties about the potential for protein production (and consumption) deficits to emerge as a result of future population growth remain current among international development actors and continue to inform their investment agendas.

While 20th century development practitioners tended to worry that too little animal protein was being produced and consumed in much of the Global South, long-running debates about how much protein is required for a healthy diet (and which foods might be best able to provide it) have recently taken on a very different complexion. Recent anxieties among consumers in the Global North about the perceived health impacts of meat and dairy consumption have combined with increasing attention to the growing environmental impacts of livestock production (notably the greenhouse gases emitted by ruminant animals and the deforestation footprint of animal feed production). Taken together, these developments have produced increasing concern among policymakers, and increasingly among some consumers and investors, over the unintended consequences of rapid growth in global livestock populations during recent decades. These developments have led to calls in some quarters for a shift towards consumption of protein derived from crops such as beans and pulses and from alternative protein products. As a recent IPES-Food (2022: 15) report notes, in this context "the impacts of meat,

1 A form of malnutrition, typically observed in young children, whose symptoms include oedema (swelling), wasting, diarrhoea, sores, discolouration and loss of patches of skin and, eventually, death (IPES-Food, 2022).

dairy, eggs, and fish are being compared against one another, against pulses and other high-protein plants, and against 'alternative proteins' – including novel plant-based substitutes, lab-grown meat, and insect-based foods" in novel ways.

As discussed above, what is included in or excluded from this category of 'high-protein' foods is often far from self-evident. Moreover, such 'protein talk' and 'protein thinking' travels very unevenly among those who concern themselves with African food systems and some of our interviewees questioned the salience of protein as a category of analysis. Nevertheless, some development finance institutions have explicitly identified 'animal protein' production as a priority sector for investment (CDC Group, 2020), and some major meat processing corporations are also rebranding themselves as 'protein companies' (Money and Cottee, 2021). For at least some important food system actors, livestock agriculture therefore increasingly appears to form part of a broader field of 'protein production' and we wished to explore how this change might be reshaping the concerns, goals and investment decisions of those who finance African food systems. In consequence, this report uses the category of 'high-protein foods,' or simply 'protein', to look beyond patterns of investment in animal products such as meat, dairy, eggs and fish alone and to explore them in relation to the financing of protein crops and of alternative protein products.

Why sub-Saharan Africa?

This report focuses on sub-Saharan Africa due both to the rapidly changing place of protein in the diets of many of its inhabitants and to the persistence within the region of economic, nutritional and environmental challenges with far-reaching implications for food systems. Rates of food insecurity and undernourishment are high across many sub-Saharan African countries, with average annual income per capita across the region standing at $1,675 as of 2020 and households spending on average around 38% of their incomes on food (OECD and FAO, 2021). The UN Food and Agriculture Organisation (FAO et al., 2022) found that 23% of people in sub-Saharan Africa had faced hunger and 63% had experienced moderate or severe food insecurity during 2021, while 261 million people within the region were undernourished (making up more than one third of the global total). However, it is important to note that statistics averaged across the region often conceal large variations in agricultural production, economic conditions and dietary practices both between different countries and between different populations within individual countries. For instance, while Nigerian households spend an average of 50% of their incomes on food, in South Africa the average share of household income spent on food is only 16% (OECD and FAO, 2021).

Per capita consumption of protein (including both animal products and protein derived from other sources) is low by global standards across much of the region, with analysis of FAO data revealing that in 2017 average protein supply for consumption across the region was 53.9g per capita per day. By contrast, it averaged 84g per capita per day in Latin America and the Caribbean, 98.6g in East Asia, 105.3g in Western Europe and 111.7g in North America. Average supply of animal protein across sub-Saharan Africa was especially low – averaging 10.7g per capita per day in 2017, in comparison to 40.7g in East Asia, 42.9g in Latin America and the Caribbean, 63.4g in Western Europe and 70.9g in North America.

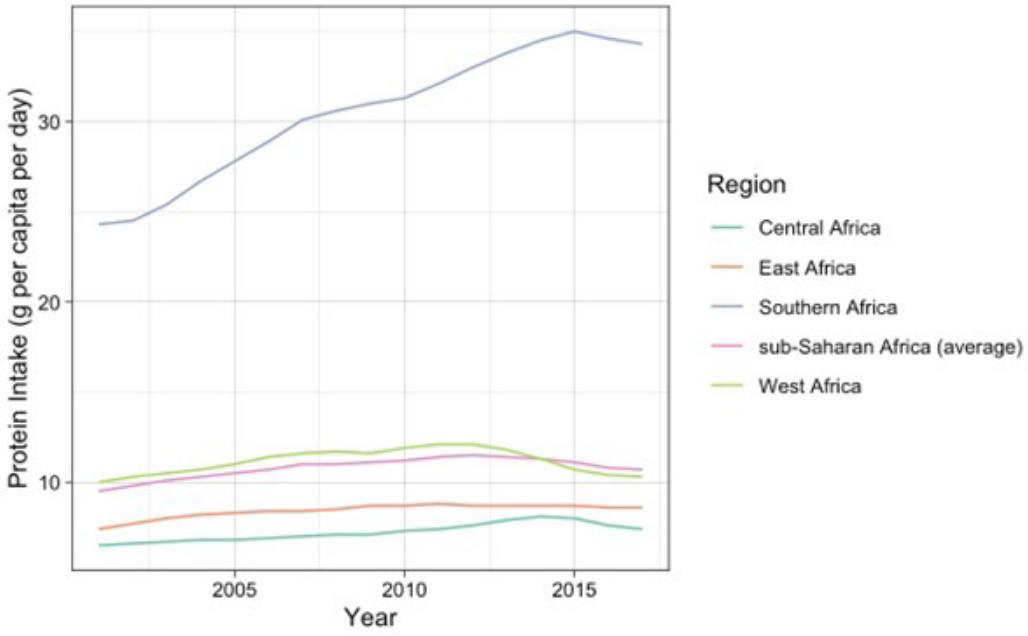

Figure 1: Daily animal protein supply per capita across sub-Saharan Africa and sub-regions, 2001-2017. (Data source: FAOSTAT database).

However, as Fig. 1 illustrates, patterns of animal protein consumption also vary significantly within sub-Saharan Africa. Average daily animal protein consumption per capita remained relatively stable at between 6g and 12g per capita per day across East, West and Central Africa between 2001 and 2017. However, in Southern Africa it increased significantly from 24.3g per day in 2001 to 34.3g per person per day in 2017. Southern Africa's higher (although still low by global standards) average daily intake of animal protein appears to result primarily from higher per capita rates of animal protein consumption in South Africa (36g per person per day in 2017) – where most of the region's population is concentrated – and in Botswana (27.7g per person per day in 2017).

Reflecting these low per capita rates of animal protein consumption, while sub-Saharan Africa is home to 14% of the world's population, and holds 15% of global crop land and 20% of global pasture, it accounts for only 4% of global meat consumption, 5% of global fresh dairy product consumption and 6% of global fish consumption. By contrast sub-Saharan Africa accounts for 37% of global root and tuber consumption, suggesting that the diets of a substantial proportion of its citizens are currently more focused on starchy vegetables than are those of inhabitants of other regions (OECD and FAO, 2021).

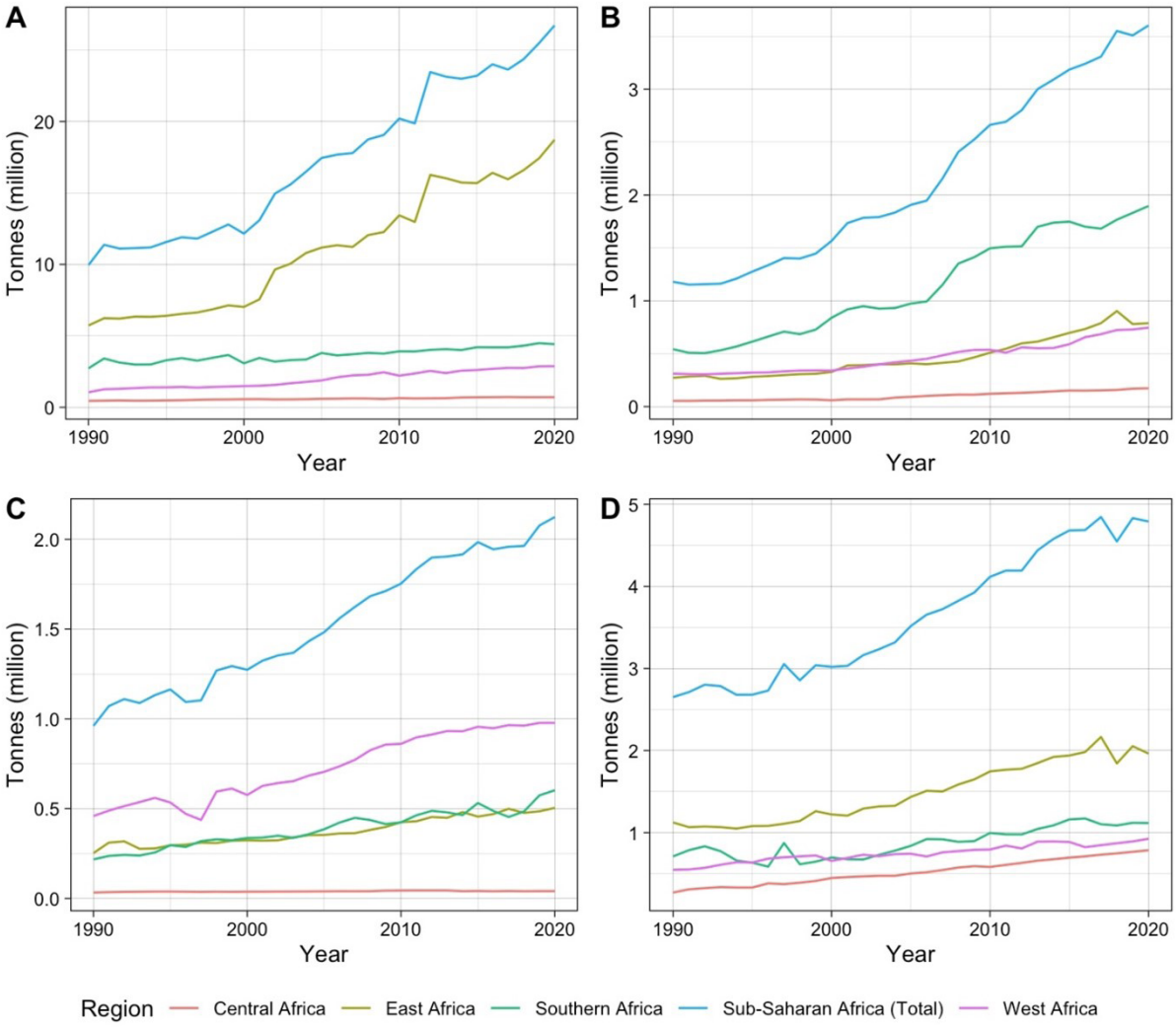

Figure 2: Production of key animal proteins in sub-Saharan Africa and sub-regions, 1990- 2020. Clockwise from top left: A) whole milk production; B) chicken meat production; C) egg production; D) beef and veal production. (Data source: FAOSTAT database).

Nevertheless, animal protein production has increased rapidly across much of sub-Saharan Africa in recent decades. As Fig. 2 highlights, whole milk production across sub-Saharan Africa has more than doubled from 9.9 million tonnes in 1990 to 26.7 million tonnes in 2020, with rapid growth in production in East Africa accounting for the vast majority of this increase. Meanwhile, chicken production has roughly trebled from 1.2 million tonnes in 1990 to 3.6 million tonnes in 2020 as illustrated in Fig. 3. The largest driver of this increase has been a near-quadrupling of chicken production from 542,000 to 1.9 million tonnes in Southern Africa, although both East and West Africa have also experienced significant growth in chicken production. Meanwhile production of eggs has more than doubled from 960,000 tonnes in 1990 to 2.1 million tonnes in 2020, while beef production has nearly doubled from 2.6 million to 4.7 million tonnes, although in both cases growth in production appears to have been distributed more evenly across different subregions of sub-Saharan Africa. The FAOSTAT database also records that over the same period pork production has nearly trebled from 626,000 to 1.6 million tonnes and sheep meat production has grown from 486,000 to 1.1 million tonnes, with significant increases in production recorded across all regions of sub-Saharan Africa.

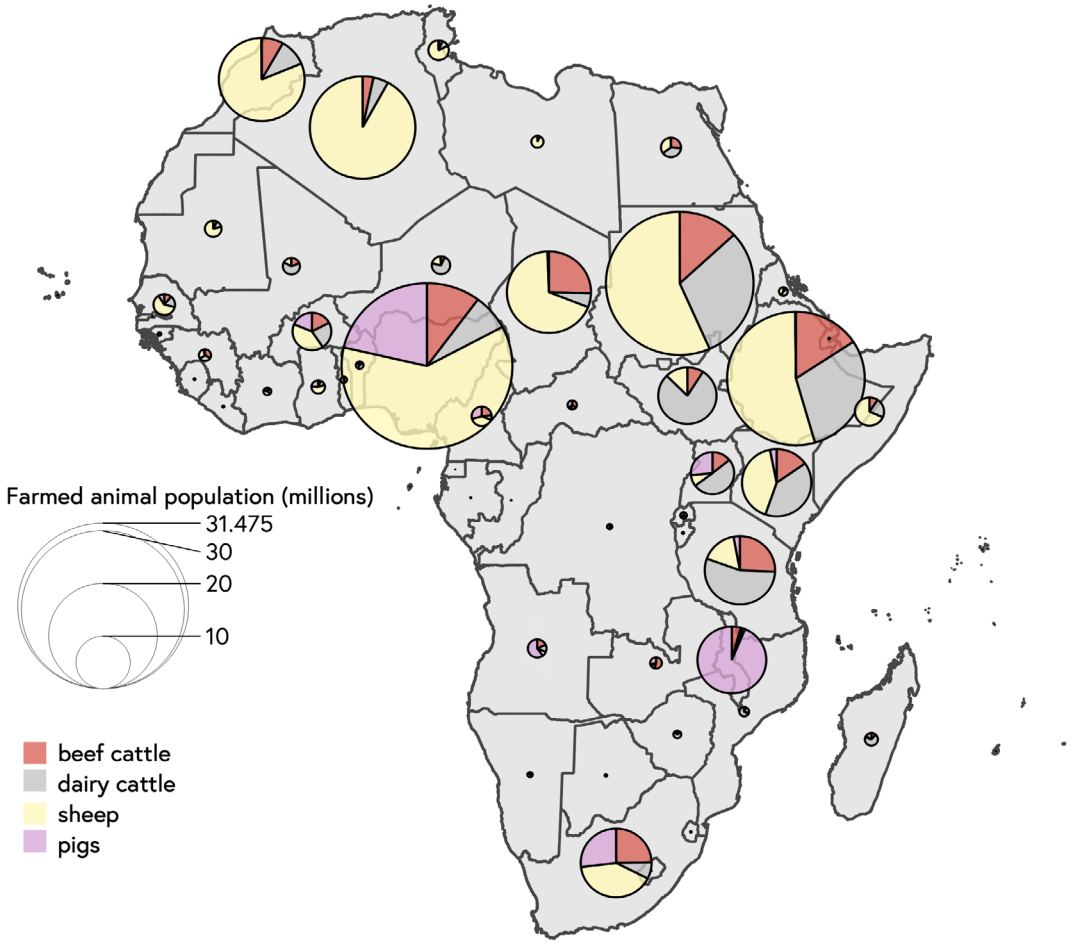

Figure 3: Farmed animal populations across Africa excluding chickens, 2020. Data source: FAOSTAT database.

As of 2018, Africa's total livestock population was estimated to include 1.9 billion chickens, 438 million goats, 384 million sheep, 356 million cattle, 40.5 million pigs and almost 31 million camels (Malabo Montpellier Panel, 2020). East African countries such as Kenya, Tanzania, Ethiopia, South Sudan and Uganda – along with Nigeria and Chad– are home to the region's largest populations of both beef and dairy cattle (as shown in Fig. 3). Meanwhile the region's largest populations of sheep are found in Nigeria, Ethiopia, Chad, Kenya and South Africa. Additionally, Nigeria, South Africa, Uganda, Angola and Malawi have emerged as sub-Saharan Africa's largest pig producers – although it is important to highlight that the region's total pig herd remains far smaller than those of the livestock species discussed above.

As Fig. 4 illustrates, South Africa is currently home to the region's largest poultry populations by far, with 968 million broiler chickens and 49 million layer chickens. Nigeria has also emerged as an important producer both of poultry meat (with 238 million broiler chickens) and of eggs (with 121 million layer chickens). This is likely because large-scale intensive poultry production has become most firmly established in these two countries, while in most other sub-Saharan African countries only a small proportion of chickens and eggs (if any) are produced within large-scale intensive production systems. Indeed, as of 2018 pastoralists and smallholder farmers practicing mixed crop-livestock agriculture produced over 60% of the meat and milk consumed in West Africa and over 80% of that consumed in East Africa (Malabo Montpellier Panel, 2020).

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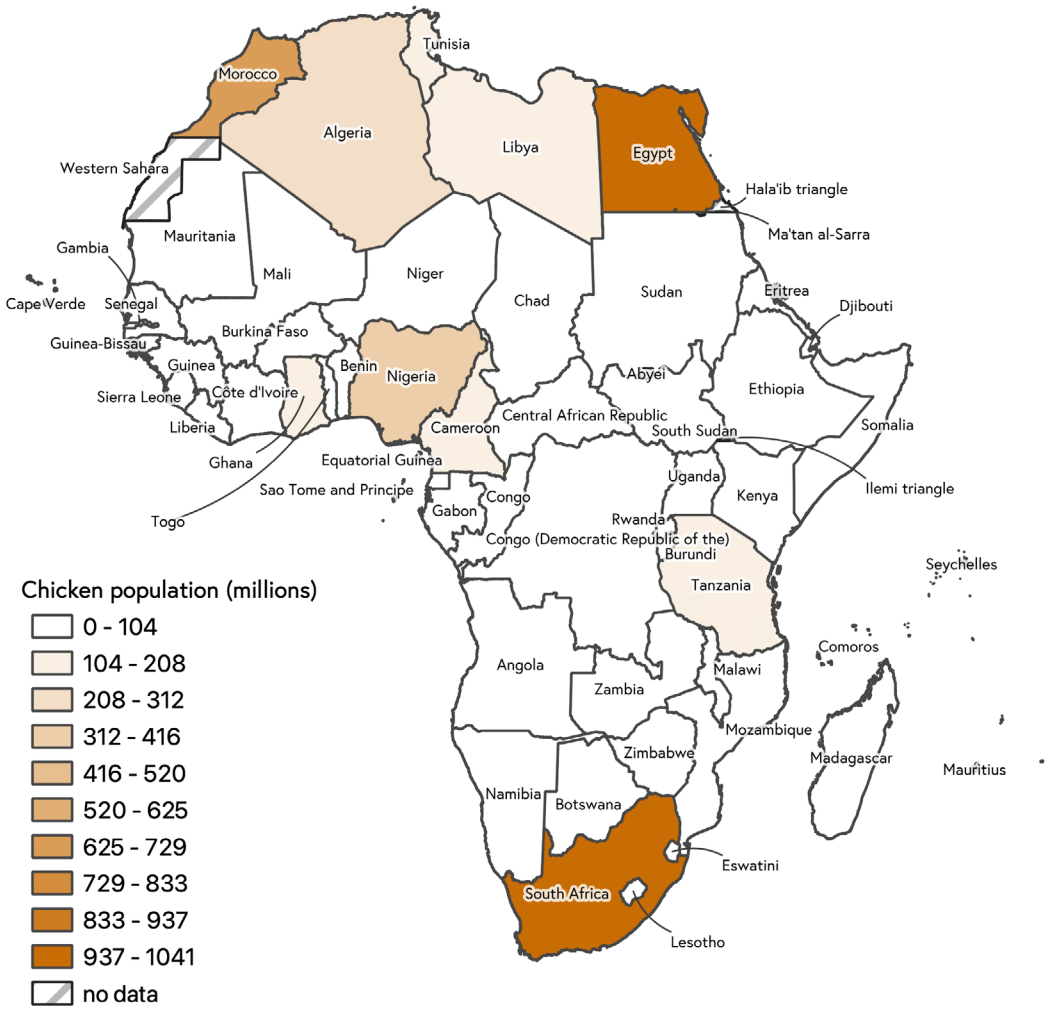

Figure 4: Chicken populations across Africa, 2020. Data source: FAOSTAT database.

While the volume of animal protein produced in sub-Saharan Africa has increased rapidly over recent decades, due to population growth this has not been accompanied by a significant per capita increase in the volume consumed across the region (with the exception of Southern Africa). This trend is forecast to continue over the coming decade. Population growth rates in many sub-Saharan African countries are among the highest in the world and the region's population is projected to increase by 31% (329 million people) between 2021 and 2030. Meanwhile the region is urbanising rapidly, and city-dwellers are expected to make up 47% of its population by 2030. These developments have prompted concern in some quarters that across much of sub-Saharan Africa the supply of protein will be unable to keep pace with population growth and changing dietary preferences over time, and thus that dietary protein intake per capita will decrease (and rates of malnutrition will increase), unless domestic protein production is expanded significantly (OECD and FAO, 2021).

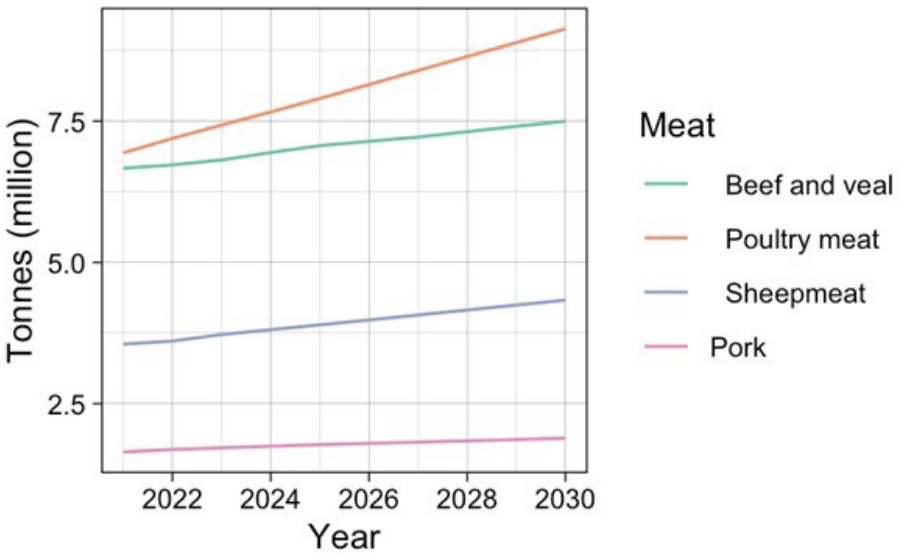

Figure 5: Projected African meat and egg production, 2021-2030. Data source: OECD & FAO (2021).

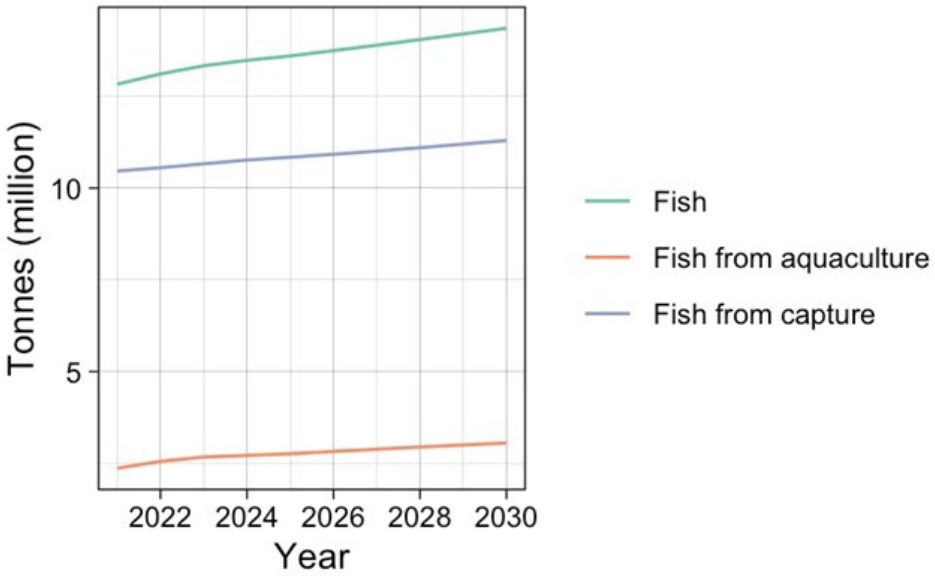

Figure 6: Projected African fish production, 2021-2030. Data source: OECD & FAO (2021).

The OECD and FAO (2021) forecast that the quantity of meat produced in sub-Saharan Africa will increase by 2.9 million tonnes (or 23%) between 2021 and 2030. As Fig. 5 illustrates, poultry meat is projected to make up the largest share of this increase (1.3 million tonnes) followed by beef and veal (740,000 tonnes), sheep meat (650,000 tonnes) and pork (260,000 tonnes). These organisations project that a shift from small-scale 'backyard' chicken rearing towards indoor intensive systems will enable this rapid increase in poultry production, while other forms of livestock agriculture will remain more focused on extensive production. Meanwhile, dairy production across sub-Saharan Africa is expected to grow by 33% (or 1.2 million tonnes) over the same period and the quantity of pulses produced is projected to increase by 27% (approximately 5 million tonnes) between 2021 and 2030.

The OECD and FAO also forecast that the volume of fish produced through aquaculture will increase by 28% over the same period (see Fig. 6), although under this projection aquaculture will still account for only 9% of total fish production in the region in 2030. Given that these projected increases in animal protein production are smaller in percentage terms than expected population growth within sub-Saharan Africa over the same period, these organisations expect them to be insufficient to satisfy additional demand for animal protein over time. They therefore forecast that "[o]ver the course of the next decade, import volumes of cereals, meat, fish, sugar and oils [will] rise substantially" (OECD and FAO, 2021: 88).

However, the OECD and FAO study also suggests that expansion in animal protein production within the region is likely to come at an environmental cost, forecasting that sub-Saharan Africa will experience a 20.95% increase in greenhouse gas (GHG) emissions from livestock over the same period. Under this projection: "Sub-Saharan Africa will account for 62% of the global increase in direct emissions from agriculture and will reach a share of 16% of global direct emissions by 2030" (OECD and FAO, 2021: 87). While the OECD and FAO study does not explore the reasons for this projected increase in GHG emissions in any detail, it projects that the total quantity of land used for crop production and pasture across sub-Saharan Africa will expand by only 0.47% (roughly 4,000 ha) between 2021 and 2030. This suggests that these organisations expect rising emissions to be driven by the raising of increasing numbers of animals on existing agricultural land, rather than by the conversion of new land within sub-Saharan Africa either to pasture or to feed crop production. Given the study's prediction that imports of meat and fish into sub-Saharan Africa will also rise, these increases in livestock-related GHG emissions within the region appear likely to be accompanied by a commensurate increase in emissions in the countries of origin of imported meat and dairy products.

Sub-Saharan Africa is thus a region in which average per capita consumption of animal products is low, while rates of undernutrition and food insecurity remain high. However, it is also a region where rapid population expansion and economic growth are expected (as the next section discusses) to produce substantial increases in demand for meat, dairy products, fish and eggs. It is a diverse region which is forecast to account for a sizeable proportion of global growth in animal protein production and therefore in livestock-related GHG emissions over the coming decade, even as many of its constituent countries import increasing volumes of meat and dairy products. Sub-Saharan Africa might therefore reasonably be characterised as a region in which both protein production systems and protein consumption practices are undergoing a transition.

Nutritional Transitions

The changes in sub-Saharan African food systems forecast by the OECD and the FAO (2021) align only partially with longstanding and influential models of the relationship between socio-economic change and dietary transformation. Since the late 1960s, nutrition researchers and prominent international organisations such as the FAO and the World Bank have observed that several dietary transformations are positively correlated with GDP growth and urbanisation. These include an increase in total calorie intake, an increase in the proportion of dietary calories derived from fats, an increase in the proportion of dietary protein derived from animal products and an increase in consumption of processed foodstuffs (Drewnowski, and Popkin, 1997; Popkin, 1993).

Building on these observations, scholars such as Popkin (1993; Drewnowski & Popkin, 1997) developed a classificatory model which identifies four different dietary patterns. Although these different patterns or 'stages' may occur at different times in different places, they are argued to occur in the following sequence: 1) hunter-gatherer provisioning; 2) labour-intensive, low-yielding agriculture punctuated by periods of famine; 3) receding famine as agriculture becomes more industrialised and incomes increase; and 4) the adoption of diets high in calories, sugar, animal fat and processed foods. Conventionally, this 'nutritional transition model' classifies countries of the Global North as occupying stage 4 at present. Meanwhile, the dietary transformations discussed in the previous paragraph are considered to occur as part of a transition from stage 3 to stage 4. As such, different counties of the Global South (and different populations within them) are characterised as occupying differing positions in a trajectory of transition from stage 3 towards stage 4 (Breewood, 2018; Poulain, 2021).

This 'nutritional transition model' depicts increasing consumption of protein, and specifically of animal products, as resulting directly from economic development and typically assumes that consumption of animal products will increase as they become more affordable relative to average incomes (Drewnowski and Poulain, 2018; Vranken et al., 2014). This produces an expectation that dietary patterns across the Global South will converge with those of the Global North as GDP per capita increases, although it allows that the types of animal products which are consumed most commonly may continue to vary for reasons of culture, religion and/or agricultural specialisation (Poulain, 2021; Schneider, 2014).

However, more recent research has highlighted modest decreases in the quantity of meat consumed per capita, and gradual increases in the proportion of citizens who describe themselves as vegetarian and vegan, in some countries of the Global North (Stewart et al., 2021). Meanwhile, alternative protein consumption has recently increased rapidly in many countries of the Global North, with plant milks accounting for 14% of total milk sales in the USA by 2018 (Money & Cottee, 2021) – possibly reflecting public concern about the environmental impacts of livestock agriculture and/or perceived negative health implications of diets high in animal products.

In consequence, some scholars suggest that per capita consumption of animal protein in some countries of the Global North may in future decline from its current high levels and that the share of dietary protein supplied by plant-based (and other) alternatives may increase (Vranken et al., 2014). Poulain (2021) argues that these developments suggests that the nutritional transition may be more reversible than previously assumed. However, it might be more precise to describe these recent developments as suggesting the possibility of an emerging fifth dietary pattern, or 'stage' of the nutritional transition, in which animal products are (to some extent) replaced by plant-based, insect-based, fermented and/or in vitro alternatives (Breewood, 2018). During the transition to this 'fifth' dietary pattern, per capita protein intake is expected to remain high, but consumption of animal products is projected to decline while consumption both of novel alternative proteins and of conventional plant proteins such as beans and pulses increases (Tziva et al., 2020). This process is also referred to by some researchers as the 'second' protein transition (Aiking and de Boer, 2020).

Aiking and de Boer (2020) suggest that these two distinct nutritional transitions are currently unfolding across the world simultaneously but in a geographically, socially and economically uneven fashion. Even as sales of alternative protein products grow in many European and North American countries, and investors and media commentators in the Global North discuss the prospect that the world may have reached (or be about to reach) 'peak meat', per capita consumption of animal protein continues to increase rapidly across much of the Global South. As such, increasing consumption of animal protein in the Global South, as many countries shift from stage 3 to stage 4 of the nutritional transition model, appears to coexist with a shift from animal proteins to alternatives in high-income countries as the Global North perhaps begins to transition from the fourth dietary pattern towards the fifth.

These developments raise questions about whether, as established nutritional transition models predict, sub-Saharan Africa will continue to experience rising rates of animal product consumption as GDP per capita increases or whether this dietary shift will be superseded by an accelerated transition towards plant and alternative proteins. However, little has so far been written about how these two distinct processes or stages of nutritional transition might interact – or about what actors, values or forms of power might be shaping its development – in locations beyond Europe and North America. This report contributes to understanding of these processes through investigating which actors are financing various forms of protein production in sub-Saharan Africa and examining the influences which guide their investment decisions.

Investor Expectations and Power

Addressing the role of financial institutions in driving and shaping these ongoing nutritional transitions is important because recent research suggests that they play a prominent role in enabling transformations in food systems and diets. Investors' role in these processes has been especially well studied in relation to the 'second nutritional transition' described above, in which diets high in animal products are displaced by increasing consumption of plant-based and 'alternative' proteins (Lonkila and Kaljonen, 2021; Mouat and Prince, 2018).

Analyses examining the causes of dramatic growth in the availability and sales of alternative protein products in recent years often highlight the important role played by venture capital investors in financing the firms which produce them. By these accounts, venture capital investors motivated by an expectation of rapid growth in demand for plant-based meat and milk alternatives (and therefore in the revenues of alternative protein producers) have frequently supplied alternative protein manufacturers with the financial resources required to develop these products and make them available on mass markets (Forum for the Future, 2021). These investors, and (importantly) their expectations about future growth in alternative protein consumption, may thus actively have helped to bring about the food future that they had predicted (Chiles, 2013; Martin, 2015; Mouat and Prince, 2018).

Based on such examples it is often argued that under certain circumstances investors' expectations about the future can become 'performative' – that is, they may "help bring into being the world they describe" (Lonkila and Kaljonen, 2021: 629) – by mobilising the financial resources required to make a change desired by the investor happen (Birch, 2022). Through such processes, investors' expectations about the future may play a key role in bringing new food products, markets and value chains into existence. Alternatively they may prove instrumental in preventing their emergence through deterring investment – for instance rumours or disclosures which cast doubt on the future profitability of an already fragile company may seal its fate by prompting investors to withdraw their capital in expectation of its failure (Haikola and Anshelm, 2018). As such the capacity to produce authoritative visions for the future of food, and to convince investors to act upon these expectations may play an important role in enabling and channelling change in the organisation of protein production, provisioning and consumption. It thus constitutes a significant form of power within the food system (Mouat and Prince, 2018; Schneider, 2019).

These observations suggest that in order to understand the development and transformation of global food systems (and specifically that of protein production, provisioning and consumption in sub-Saharan Africa) it is important to establish which financial actors invest in protein production and to examine which products and production systems they finance. Crucially, however, they also highlight that in order to grasp what motivates these investors it is crucial to investigate the expectations which investors in protein production hold about the future and to explore the values, beliefs and theories of change from which those expectations arise (Borup et al., 2006; Martin, 2015). Understanding these expectations, or 'investor visions', is important because investment is an inherently future-oriented activity. Financial actors invest in order to produce a desired outcome in the future, whether this goal is financial in nature (for instance the realisation of a certain rate of profit on the original investment) or involves the achievement of some other objective (for instance the alleviation of rural poverty). Individuals' and organisations' decisions about whether or not to invest in a given activity are therefore typically based on certain expectations about "the developments of future values" (Ouma, 2020: 63).

Accordingly, the research presented in this report examined both who invests in protein production in sub-Saharan Africa and what visions for or expectations about the future of protein are held by and motivate these investors. In so doing it aimed to establish why particular groups of investors finance some places, protein sources, and sections of value chains (and perhaps neglect others). The following chapter outlines the methodology used to address these research questions, while the remainder of the report presents the findings of the research.

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3. Research Methodology

Summary

- The research presented in this report was conducted in two phases. During the first, the author conducted a rapid review of publicly available reports and statistics in order to establish which groups of investors provide the largest quantities of agricultural investment to sub-Saharan Africa and (where possible) what proportion of their investment is used to finance protein production.
- During the second phase of the research the author undertook nineteen expert interviews. Interviewees included both employees of organisations identified through desk research as key investors in protein production within the region and other individuals possessing a detailed understanding of these investors' motives.
- These interviews provided insight into the goals which motivate different investors to finance protein production in sub-Saharan Africa, the ways in which these aspirations shape their decisions to invest in specific protein products or value chains, and the expectations and theories of change which inform these investment decisions.

Phase 1: Desk Research

The research presented in this report was conducted in two phases. During the first phase, the author conducted a rapid review of publicly available reports and statistics with the aim of assessing which groups of investors provide the largest quantities of financing to protein production in sub-Saharan Africa and of establishing how much each group invests. Academic publications relevant to agricultural investment in sub-Saharan Africa were identified through structured searches of the Scopus and Google Scholar databases. Meanwhile, relevant reports were identified through searches of the websites of relevant international food policy actors (e.g. the FAO, WHO and UN Development Programme), development finance institutions (such as the World Bank and the African Development Bank) and financial industry organisations (such as the Emerging Markets Investors Alliance and Global Impact Investing Network).

The author identified datasets relevant to investment in protein production in sub-Saharan Africa through examining the original sources of data used in the publications analysed during this initial literature review. While proprietary financial datasets were excluded from further consideration due to budgetary restrictions, this stage of the research identified the following publicly available data sources as holding quantitative financial data relevant to this research project:

- The UNFAO's FAOSTAT platform (which provides country-level data on government spending, Overseas Development Assistance (ODA) funding and commercial credit provided by the banking sector to the Agriculture, Forestry and Fishing sector).
- The OECD's Creditor Reporting System (which provides data on the quantities of ODA funding provided to the agricultural and fisheries sectors of eligible countries by Development Finance Institutions, philanthropic organisations and the governments of OECD Member States).
- The OECD's Producer Support Estimate (PSE) database (which provides comparable data on the monetary value derived by agricultural producers from the government agricultural policies of countries across the world).

Descriptive analysis of these publicly available datasets was carried out in order to ascertain which broad categories of public, private and third sector actors are most prominently involved in financing agricultural production in sub-Saharan Africa. This analysis addressed our first research question by establishing which groups of investors commit the largest quantities of finance to sub-Saharan Africa's agriculture, forestry and fisheries sector and by exploring (where possible) what proportion of their investment is devoted to the animal protein sector. The results of most elements of this initial phase of desk research are presented in Chapter 4, although the results of the analysis of the PSE database are presented separately Chapter 6.

However, the understanding of the landscape of investment in African protein production provided by this analysis of publicly available quantitative data was subject to several important limitations. First, very little data on private sector investors' role in financing protein production within the region is publicly available – making it difficult to assess the scale and nature of their role within the wider agricultural investment landscape. Second, while the desk research conducted during the first phase of the project provided a broad overview of who finances protein production in sub-Saharan Africa, it provided relatively little information about which protein sources and production systems different actors invest in. Finally, analysis of statistical data alone provides little insight into the financial or normative goals which motivate these investors to finance protein production in sub-Saharan Africa or the theories of change which make them believe that their investments will help to bring about these goals.

Phase 2: Expert Interviews

In order to address these limitations of this initial desk research, the author undertook a second phase expert interview research. Building on Littig's (2009: 100) characterization of an expert interviewee as a person "who is responsible for and has privileged access to the knowledge of specific groups of people or decision-making processes", interviews were sought with individuals possessing a detailed understanding of the motives and investment decision making processes of organisations which finance protein production in sub-Saharan Africa (Robinson, 2021).

Nineteen of these expert interviews were carried out between January and March 2022. Some interviewees held professional roles which involved them directly in the investment decisions of organisations identified through desk research as key funders of protein production in sub-Saharan Africa. Others (e.g. employees of research organisations, agricultural development consultants and employees of NGOs which assist African producer organisations in gaining access to finance) were able to provide insight into broader differences and similarities between the motivations of various investors in African protein production due to longstanding professional links with multiple agricultural development funders. Both groups of interviewees were judged to possess extensive knowledge both of the expectations about the future held by key investors and of the processes through which these expectations informed their financial decisions.

Interviewees were recruited through a combination of snowball sampling and emails to key figures within organisations identified through desk research as having invested in protein production in sub-Saharan Africa (whether through grants, loans or direct equity holdings in African protein production enterprises). In keeping with the norms of expert interview research (Littig, 2009) this project adopted a purposive sampling strategy, with interviews continuing until the sample included representatives of all but two of the major groups of investors in African agriculture identified during the desk research phase. National governments were excluded from the interview sample because no single government's investment priorities are likely to be relevant across the entire sub-Saharan African region. By contrast, the author attempted to secure interviews with representatives of multinational meat and dairy companies with operations in sub-Saharan Africa, which might be expected to act as providers of foreign direct investment. However, none were willing to contribute to the project, perhaps because such investments are commercially and/or reputationally sensitive for these firms.

Due to time and budgetary constraints the number of interviewees representing each of the remaining group of investors remains small, and the findings of the interview study should not be assumed to be either exhaustive or statistically representative of the wider population of investors in protein production in sub-Saharan Africa (Bernard, 2006). The interview sample comprised:

- Five employees of private sector financial institutions (one partner and one senior impact manager working within impact investment firms, one partner and one senior investment manager working within private equity firms, plus one agricultural analyst employed by an international commercial bank)
- Two employees of philanthropic foundations whose grant-making programmes included schemes targeted at small-scale livestock producers in sub-Saharan Africa
- Two employees of development finance institutions (one multilateral and one bilateral)
- Four employees of NGOs and multi-stakeholder networks focused on broadening access to finance for agricultural producers in the Global South
- One alternative protein producer based in sub-Saharan Africa
- Two agricultural development consultants
- Four employees of international agricultural research organisations and members of relevant expert panels

Two interviewees were located in West Africa, one was based in Southern Africa, six were based in East Africa, and the remaining ten interviewees were located in Europe and North America (although most had worked extensively in sub-Saharan Africa in previous roles).

Once interviewees had been recruited, the researcher conducted semi-structured interviews which ranged in duration from approximately 30 minutes to 90 minutes and took place over video chat platforms such as Zoom, Microsoft Teams or Google Meet. The precise list of questions posed during each interview was tailored to reflect the characteristics of the interviewee's organization and of their role within it, questions were posed in an open-ended format in order to allow interviewees to answer in their own terms, and interviewees were given opportunities to highlight any additional topics which they felt should be discussed. Each of these interviews was recorded and transcribed, with the transcripts subsequently coded and analysed using NVivo 12.

In order to maintain the anonymity of research participants, the names of the individuals and organisations which contributed to this research have been withheld and no information which might identify a specific organisation is reproduced in this report. All materials containing the names of these individuals and organisations, and the details of their responses to interview questions, have been stored exclusively on secure servers maintained by the University of Oxford in order to ensure that they are accessible only to the researcher.

Open coding was initially used to identify topics (or 'themes') which recurred across different transcripts (Bernard, 2006). This enabled the author to compare different interviewees' accounts of matters such as the goals and intended beneficiaries of investment in sub-Saharan Africa, the ways in which investors' aspirations informed their decisions to finance (or avoid) specific protein products or value chains, and the expectations and theories of change which motivated their investment decisions. Further analysis of the similarities and variations between different interviewees' positions on various themes enabled the author to identify three distinct groups of investors, each of whose investment decisions were guided by a different 'vision' for the future of protein in sub-Saharan Africa. These visions, and the broader results of the interview research conducted during phase 2 of the project, are presented in Chapter 5.

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4. Sub-Saharan Africa's Agricultural Investment Landscape

Summary

- This chapter analyses publicly available statistics on agricultural investment in sub-Saharan Africa in order to establish which groups of investors are most prominently involved in financing agricultural production – and, where possible, in financing protein production specifically – within the region.
- Government spending and agricultural credit provided by the banking sector are the two largest sources of agricultural investment at the global scale. However, sub-Saharan Africa's Agriculture, Food and Fisheries sector receives relatively little investment from either of these sources. In 2019 sub-Saharan Africa accounted for only 4% of global government spending on the Agriculture, Forestry and Fishing sector and a mere 1% of global agricultural credit.
- Sub-Saharan Africa receives 35% of global Overseas Development Assistance (ODA) spending on the Agriculture, Forestry and Fishing sector. However, ODA accounts for only a small proportion of global agricultural investment.
- Private sector financial institutions appear to play a smaller role in sub-Saharan Africa's agricultural finance landscape than in those of most other regions. The main sources of private sector agricultural investment within the region are foreign direct investment by international agribusiness corporations, private equity funds and commercial banks.
- Little data relating specifically to investment in protein production in sub-Saharan Africa is publicly available, meaning that it is not possible to estimate reliably what proportion of total agricultural investment into the region is devoted to protein production. Data on government and private sector investment is particularly sparse.
- However, the proportion of total ODA spending on agricultural development in sub-Saharan Africa allocated explicitly to the livestock and fisheries sectors has grown from 6.5% in 2011 to 14.8% in 2020. This suggests that ODA funders may have begun to place greater importance on the livestock and fisheries sectors in recent years.

Introduction

This chapter analyses publicly available statistics on agricultural investment in sub-Saharan Africa in order to establish which groups of public, private and third sector investors are most prominently involved in financing agricultural production within the region. While its aim in doing so is to establish who finances protein production in sub-Saharan Africa, it is important to note that data relating specifically to investment in protein production within the region is scarce.

As a result, much of this chapter's analysis is based on data which describes patterns of investment in sub-Saharan Africa's agricultural sector in general, operating on the assumption that a certain proportion of this investment will be devoted specifically to protein production. It is also important to note that investment in protein production by individuals and families is not routinely captured in official statistics, and its relative importance therefore could not be estimated in this analysis. The first section of this chapter reviews broad patterns of agricultural investment in sub-Saharan Africa, while the second section provides a more detailed analysis both of the available data relating specifically to investment in protein production within the region and of this data's limitations.

Agricultural Investment

Data held by the UN Food and Agriculture Organisation's FAOSTAT database shows that agricultural credit – in the forms of "loans and advances given by the banking sector to farmers or to rural households, to agricultural cooperatives or to any agri-related businesses" (FAO, 2022: 6) – represents the largest single source of investment in the global Agriculture, Food and Fisheries sector. In 2019 the banking sector provided $1.12tn of agricultural credit worldwide, while global central government expenditure on the Agriculture, Food and Fisheries sector totalled $146bn – meaning that at the global scale government spending also represents an important (if much smaller) source of agricultural investment.

However, sub-Saharan Africa's Agriculture, Food and Fisheries sector receives only a small proportion of these global flows of agricultural credit and central government spending. Despite holding 14% of the world's population, 14% of the global livestock population and 15% of the world's agricultural land, in 2019 the region accounted for only 4% ($5.7bn) of global central government investment in the Agriculture, Forestry and Fishing sector and a mere 1% ($12bn) of global agricultural credit (as illustrated in Fig. 7).

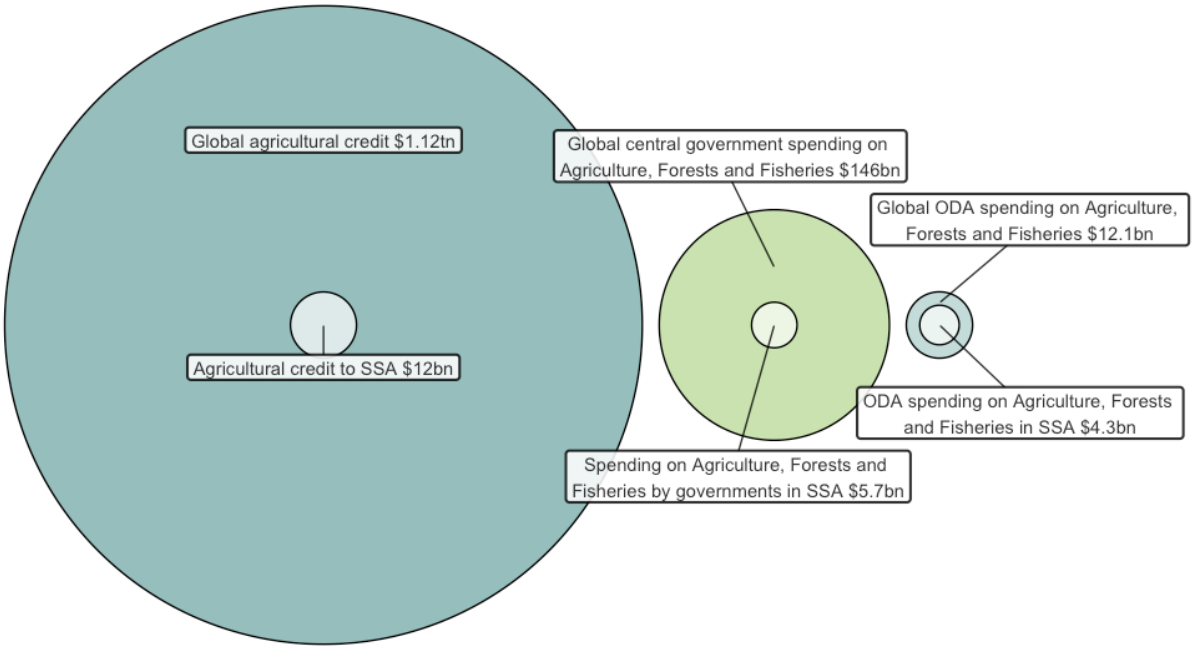

Figure 7: Financial flows into sub-Saharan African Agriculture, Forestry and Fisheries as a proportion of global agricultural investment, 2019. Data source: FAOSTAT database.

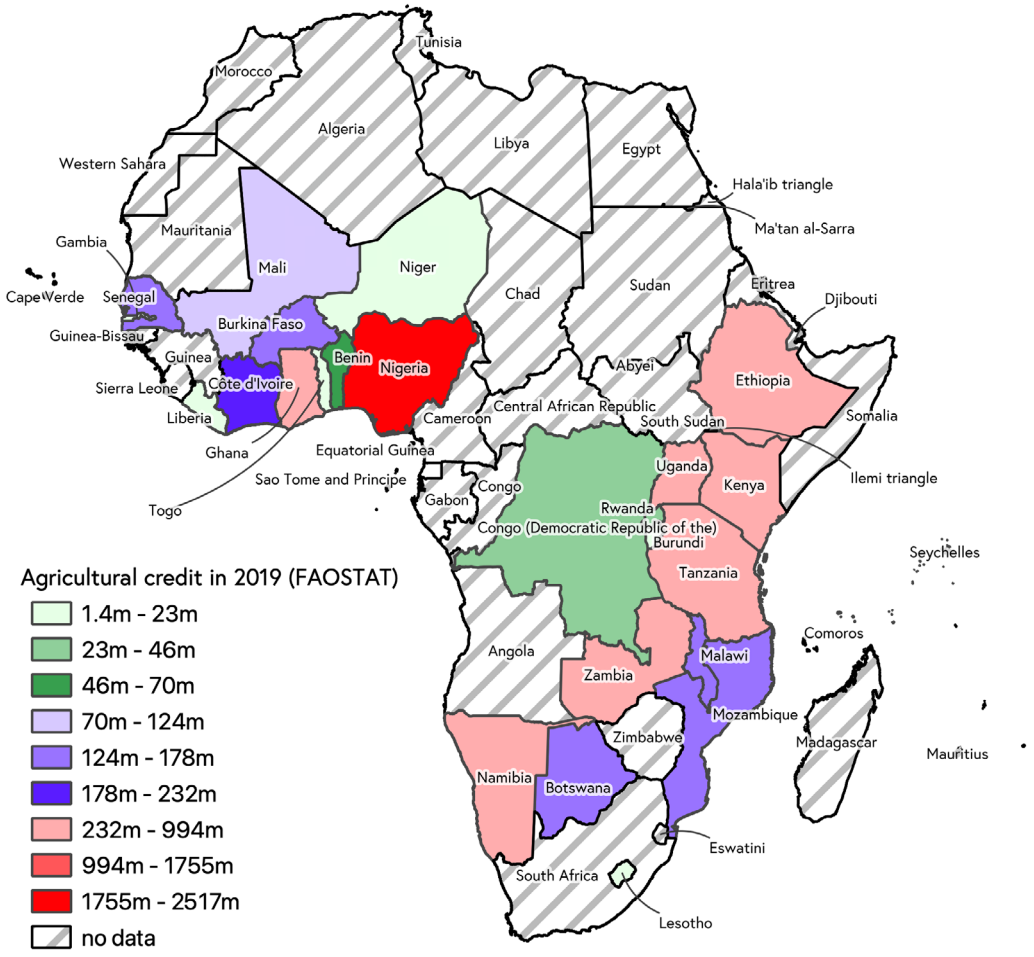

Figure 8: Agricultural credit investment across sub-Saharan Africa, 2019. Data source: FAOSTAT database.

As Fig. 8 illustrates, of the 26 sub-Saharan African countries which reported agricultural credit data to the FAO in 2019, Nigeria accounted for the largest volume of agricultural credit ($2.5bn) followed by Tanzania ($824mn), Kenya ($794mn), Ethiopia ($701mn) and Uganda ($583mn). By contrast, in 2019 Asia accounted for 49% of global agricultural credit ($550bn), with China alone receiving $194bn and India receiving a further $167bn. Meanwhile, Europe received 29% of global agricultural credit ($322bn) and the Americas received 12% ($134bn).

While most sub-Saharan African countries are marginal to global flows of agricultural credit, the region is the world's largest recipient of Overseas Development Assistance (ODA) spending on the Agriculture, Forestry and Fishing sector. However, global ODA spending on this sector is relatively low – totalling only $12.1bn in 2019. As a result, although sub-Saharan Africa received 35% of global ODA spending on the Agriculture, Forestry and Fishing sector in 2019, this represents an investment of only $4.3bn – a relatively modest sum by global standards.

Research conducted separately by the African Development Bank (2016, 2021) provides a more detailed summary of the landscape of agricultural investment within Africa (including North Africa). While the African Development

Bank's analysis draws on different underlying datasets and classifies financial flows differently, making precise comparisons to the FAO's data difficult, it estimates that total investment into African agriculture in 2014 was a relatively similar $27.36bn. It further estimates that $15.8bn (58%) of this funding was provided by public sector investors, while $11.56bn (42%) was invested by private sector organisations. According to the African Development Bank's estimate (and as illustrated below in Fig. 9), as of 2014 the main public sector investors in agriculture across Africa were:

- National governments (whose combined agricultural expenditure totalled $12bn)
- Multilateral development finance institutions (DFIs), bilateral ODA spending and philanthropic organisations (whose combined total expenditure was $3.8bn)

Meanwhile, the major sources of private sector finance were:

- Foreign direct investment by international agribusiness corporations (estimated to have totalled $10bn)
- Private equity funds (estimated to have invested $900mn in African agricultural enterprises).
- Commercial banks (estimated to have loaned $660mn to the agricultural sector)

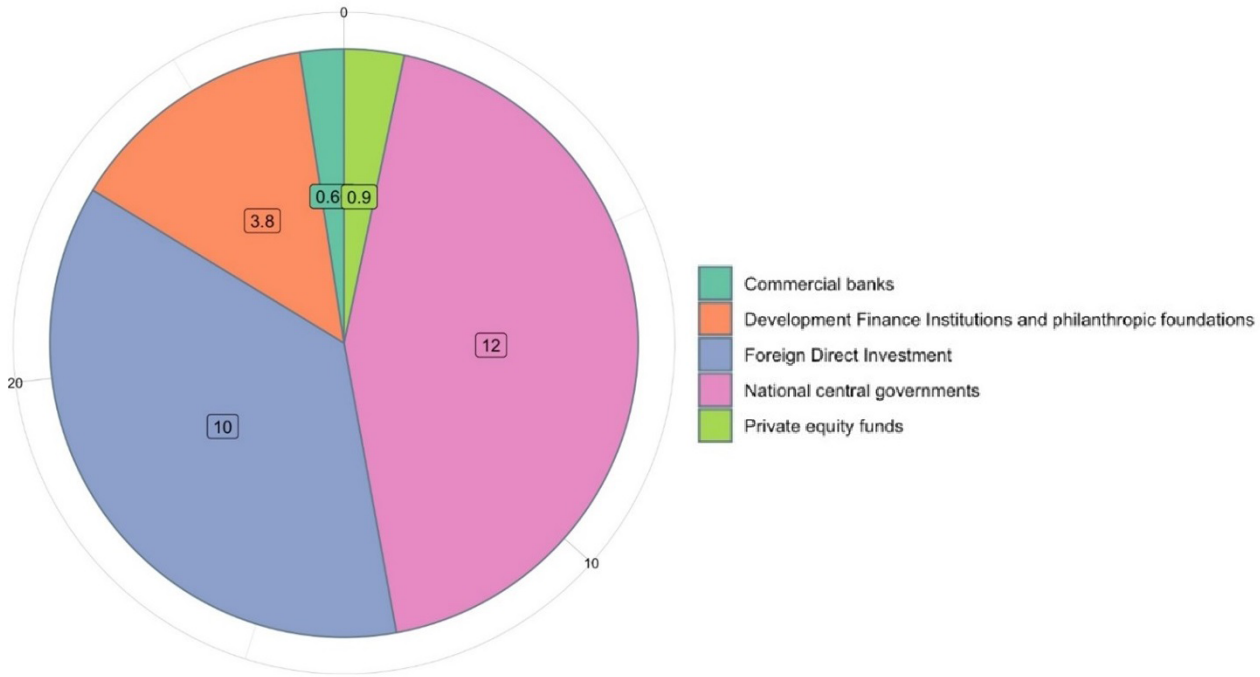

Figure 9: Investment in African agriculture by source, 2014. Data source: African Development Bank (2016).

In summary, analysis of data compiled by the FAO and the African Development Bank suggests that sub-Saharan Africa's Agriculture, Food and Fisheries sector receives far less investment overall than do those of other regions. The volumes of agricultural credit provided to agricultural producers within the region appears especially small. This suggests that private sector financial institutions such as banks and private equity funds are likely to play a less prominent role in sub-Saharan Africa's agricultural finance landscape than in those of most other regions. Meanwhile ODA (and the Development Finance Institutions which provide it) appears to represent a more important source of agricultural investment in sub-Saharan Africa than it does elsewhere.

Protein Production

While conducting desktop research for this project, the author attempted to refine the African Development Bank's analysis by examining which groups of investors might be providing the largest quantities of finance to protein production in sub-Saharan Africa. However, limitations in publicly available data sources made it difficult both to ascertain what proportion of agricultural investment is allocated specifically to protein production and (as a result) to establish whether the largest overall investors in African agriculture are also the main investors in protein production on the continent. Importantly, the data disclosed by national governments to publicly available sources does not typically disaggregate agricultural expenditure to provide information on the quantity of funding provided to specific agricultural subsectors such as livestock agriculture, aquaculture and legume production.

However, the OECD's Creditor Reporting System (CRS) provides a more detailed breakdown of the sub-sectoral focus of ODA funding allocated towards agricultural development. Analysis of the CRS database revealed that in 2020 sub-Saharan African countries received $3.66bn of agricultural development funding, $338.5m of which was targeted at the livestock agriculture sector (including veterinary services). Meanwhile, $204.7m of agricultural development funding was targeted towards the fisheries sector. As such, in 2020 approximately 9.2% of total ODA spending on agricultural development in sub-Saharan Africa was allocated explicitly to the livestock sector, while 5.6% was allocated directly to fisheries.

Although funding allocated explicitly to animal protein production thus makes up a relatively small proportion of total ODA spending on agricultural development in sub-Saharan Africa, it is important to note that total spending on fisheries has doubled – and spending on the livestock sector has increased more than five-fold – since 2011 (as illustrated in Fig. 10). By contrast, total ODA spending on agricultural development in sub-Saharan Africa grew by roughly 50% over the same time period. As such, the percentage of agricultural development funding for sub-Saharan Africa which is allocated directly to the livestock and fisheries sectors increased from 6.5% in 2011 to 10.5% in 2019, and reached 14.8% in 2020. This suggests that ODA funders may have begun to place greater importance on the livestock and fisheries sectors in recent years.

While the OECD data provides the most detailed publicly available breakdown of the focus of public sector agricultural investment in sub-Saharan Africa, it has its own limitations. As some interviewees who contributed to this project pointed out, funding which is provided by philanthropic organisations, DFIs or national governments to enterprises or communities involved in protein production may be allocated to projects whose primary objectives lie in fields such as regional economic development or gender equality. As a result, such funding may not be recorded as investment in protein production, even if it is used to support activities such as the provision of training in aquaculture techniques to smallholder farmers or the establishment of a micro-finance scheme for women engaged in small-scale poultry farming.

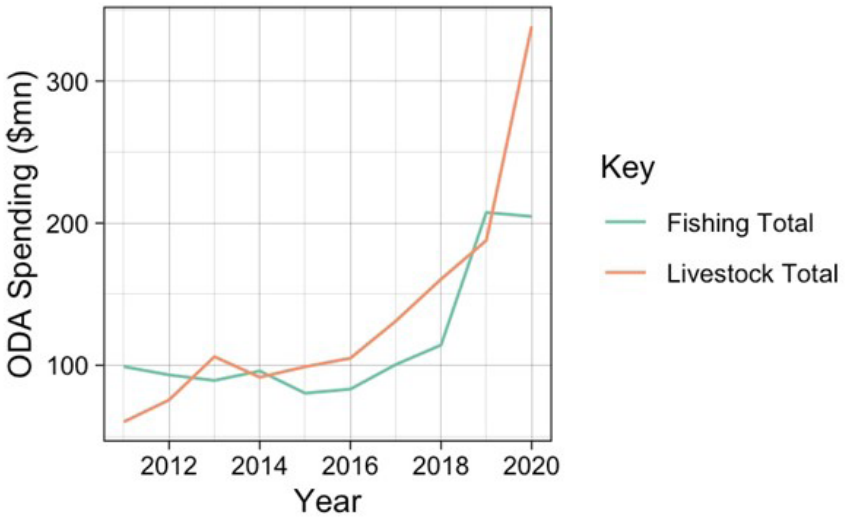

Figure 10: Overseas Development Assistance spending on animal protein production in sub-Saharan Africa, 2011-2020. Data source: OECD Creditor Reporting System database.

Moreover, the OECD classifies ODA spending simply as having been allocated either to crop, livestock or fish production. This makes it impossible either to disentangle investments in protein crops such as legumes from funding allocated to the production of crops such as fruits and vegetables or to distinguish investment in wild capture fisheries from funding allocated to aquaculture projects. Taken together, these constraints mean that some relevant funding streams are likely to be poorly represented in official datasets. It is therefore difficult to estimate the total quantity of ODA funding invested in protein production accurately and that the figures presented above may underestimate the total quantity of investment provided by development finance actors.

Even less data relating to private sector investment in protein production is available due to the legal organisation of the private sector actors which are most prominently involved in financing African agriculture (Watts and Scales, 2020). Investment by international agribusinesses in the protein production operations of their African partner firms or subsidiaries is likely to be subsumed into broader categories of expenditure in their public financial reports and accounts, making it difficult to estimate the size of their investments in protein production. Alternatively, their operations in sub-Saharan Africa may be administered through subsidiaries or holding companies which produce separate accounts, meaning that investment in these enterprises does not appear in the parent company's public financial disclosures at all.

Meanwhile, sub-Saharan Africa's agricultural and food sectors are dominated by privately owned companies and informal enterprises which are subject to far more limited financial disclosure requirements than are shareholder-owned corporations which are listed on stock exchanges. As a result, little information is available in the public domain about the holdings of most private equity firms or the size of their agricultural investments (Ouma, 2020). Given that 75% of the agricultural investment funds focusing on Africa are private equity funds, while listed equity funds make up a negligible proportion of the market, this severely limits the availability of public data on equity investments on the continent (Valoral Advisors, 2018). Likewise, while commercial banks will typically release publicly available annual financial reports, these documents rarely disaggregate their lending sufficiently to establish how much money they have invested in the agri-food sector. Although commercial providers of financial data maintain proprietary databases recording both private equity investment into emerging markets and commercial banks' lending activities, the author did not have funding to secure access to these resources and was thus unable to make a robust estimate of the size of private sector financial flows into protein production in sub-Saharan Africa.

In summary, much remains unknown about the landscape of investment in protein production in sub-Saharan Africa including the total quantity of capital invested and the identities of the largest individual providers of funding. However, if wider patterns of investment in African agriculture are replicated then the most prominent sources of investment are likely to be public sector expenditure by national governments and foreign direct investment by international agribusiness corporations. Multilateral and bilateral development assistance, along with philanthropic investment, might be expected to account for a considerably smaller but still significant proportion of investment. It is probable that private equity funds and commercial banks are the most prominent private sector investors in protein production in sub-Saharan Africa, but that they supply only a small proportion of its total funding. Meanwhile, the contribution of investment made by private individuals, families and small businesses is poorly captured by official datasets and remains impossible to estimate.

5. Investor Visions

Summary

- This chapter presents the findings of expert interviews conducted during phase 2 of the project. These interviews were intended to establish what expectations about the future, and what financial and/or normative goals, motivate different groups of investors to finance protein production in sub-Saharan Africa. They were also designed to provide insight into which protein sources and production systems each group of investors prefers to finance, and into the theories of change which make them believe that making these investments will contribute to achieving their goals.
- All interviewees expected that over the coming decades economic growth and urbanisation within many sub-Saharan African countries would produce a significant increase in demand for protein across the region. As a result, they acted in the belief that rapid increases in protein consumption in sub-Saharan Africa over the coming decades were inevitable, and that their organisations should therefore invest in those activities which would satisfy this future 'need' or 'demand' for protein most effectively.
- However, different groups of investors were motivated by contrasting goals and values which led them to varying conclusions about what type of protein should be produced in order to satisfy this future need and about how and by whom it should be produced. This produced three distinct visions for the future of African food systems – which this report terms Smallholder Intensification, Protein for Profit and Protein Diversification.
- While the Smallholder Intensification and Protein for Profit visions did overlap under some circumstances, in most cases proponents of different visions tended to invest in different protein value chains, production systems and geographical locations.
- This chapter examines each vision in turn, describing who pursues and finances it, why do so, what locations, products and value chain stages they tend to invest in, and how they expect their investments to bring about the future outcomes that they desire. Due to the richness of this material, separate summary boxes are provided at the beginning of the section dealing with each of these visions.

Introduction

This chapter presents the findings of interview research conducted during the second phase of the project. Building on the results of the desk research presented in Chapter 4, the author sought interviews with representatives of key groups of agricultural investors as well as other individuals likely to possess a detailed understanding of the motives and investment decision making processes of organisations with investments in protein production in sub-Saharan Africa. These interviews were intended to establish what expectations about the future, and what financial and/or normative goals, motivated different groups of investors to finance protein production in sub-Saharan Africa. They also explored which protein sources and production systems each group of investors prefers to finance, and what theories of change make them believe that making these investments will contribute to achieving their goals.

The chapter begins by examining interviewees' expectations about the future of protein in sub-Saharan Africa, highlighting that all interviewees expected demand for animal protein to expand rapidly in sub-Saharan Africa

over the coming decades and therefore believed that sub-Saharan African countries would 'need' to produce more protein. However, different groups of investors' contrasting beliefs and objectives led them several different understandings of what type of protein should be produced in order to satisfy this need, of how and by whom it should be produced and, as a result, of which protein sources and production systems they should invest in. The main body of this chapter therefore describes three distinct investor 'visions' for the future of protein in sub-Saharan Africa, and the prescriptions for investment which flow from them.

Expecting Nutritional Transitions

Interviewees expected without exception that over the coming decades economic growth within many sub-Saharan African countries would cause protein-rich foodstuffs to assume an increasingly prominent place in the diets of their citizens and thus produce a significant increase in average protein consumption per person across the region. In some cases they justified these expectations by referring explicitly to academic research which forecast, based on the nutritional transition models introduced in Chapter 2, that demand for protein would at least double across the continent of Africa by 2050. Interviewees typically presented this close correlation between population expansion, GDP growth and increasing consumption of protein-rich foodstuffs as an unalterable fact and often characterised consumer preferences for higher-protein foodstuffs as being innate and therefore not susceptible to modification. This led them to conclude that rapid increases in protein consumption in sub-Saharan Africa over the coming decades were inevitable.

> **"As you know the protein demand increase [is] driven by (...) per capita income, urbanisation and food preferences. The African continent's going to be where that protein [demand] is going to increase disproportionately – 168% by 2050 or something is the stats that I've seen forecast. And if the demand is going to come [from] there, you know, we cannot increase the supply at the current productivity levels. You need to increase unit productivity."**
>
> ***(Interview 07, philanthropic foundation)***

This suggests that the nutritional transition model has, for many investors, transformed from being a description of past economic and dietary changes in other parts of the world into a set of predictions about the future of food in sub-Saharan Africa which they consider sufficiently credible to use as a basis for their investment decision-making. In essence, they act in the expectation that the future development of sub-Saharan African economies and diets will broadly repeat patterns of change previously observed in Europe, North America and (increasingly) in Asia and Latin America. Most interviewees therefore began from a presumption that the future of food in sub-Saharan Africa would be characterised by a rapidly growing 'need' or 'demand' for more protein, and that their organisations should therefore invest in those activities which would satisfy this need most effectively. Alternative possibilities were typically either dismissed as implausible or not considered at all, casting increased investment in the production of protein on the continent as an unavoidable necessity.

Despite this broad agreement that there is a 'need' for sub-Saharan African countries to produce more protein in order to meet this future demand, interviewees held several different understandings of what type of protein should be produced in order to satisfy this need and of how and by whom it should be produced. Analysis of the interview material identified three distinct visions for the future of African food systems, which this report terms Smallholder Intensification, Protein for Profit and Protein Diversification (whose main characteristics are summarised in Table 1). These visions were held by distinct groups of investors motivated by differing goals and values which led them to focus their investments on different protein value chains, production systems and

geographical locations, and appeared to be intended to generate contrasting systems of protein production and provisioning. The Smallholder Intensification vision was prevalent among DFIs, philanthropic organisations and impact investors whose investments were intended to reduce poverty and malnutrition – and to facilitate sustainable development – by providing smallholder farmers and pastoralists with access both to high-quality agricultural inputs and to higher-value markets for their produce. By contrast, the Protein for Profit vision expresses the values and goals of private equity funds and commercial banks which aim simply to produce a competitive financial return on their clients' investments through investing in animal protein (and specifically poultry and egg) production. Finally, the Protein Diversification vision was held by a distinct group of venture capital investors who were motivated by concerns over the environmental impacts and ethical desirability of expanding sub-Saharan Africa's livestock sector and sought instead to satisfy expected future demand for protein through financing manufacturers of alternative protein products.

This chapter examines each of these visions in turn, outlining who pursues and finances it, why they are motivated to do so, what locations, products and value chain stages they tend to invest in, and how they expect their investments to bring about the future outcomes that they desire. Because reliable data on the quantities of capital invested in African agriculture is scarce (as discussed in the previous chapter), and because evaluating the impacts of these investments on agricultural production and diets in sub-Saharan Africa would both be intellectually difficult and demand more resources than were available to this project, this report simply describes these visions. It does not attempt to measure the size of the financial flows mobilised by their proponents, to determine how successful their adherents have been in achieving their goals or to assess the magnitude of their impact on sub-Saharan African food systems.

Table 1: Three Investor Visions	Smallholder Intensification	Protein for Profit	Protein Diversification
Key Investors	Development; Finance; Institutions; Philanthropic organisations; Impact funds	Private equity funds; Commercial banks	'Vegan' venture capital funds
Financial instruments used	Grants, loans and equity investments	Loans and equity investments	Equity investments
Objectives	Reduce poverty among smallholder farmers and pastoralists; Reduce malnutrition: Ensure environmental sustainability	Produce market-competitive rates of return on investment; Secure a dominant position in sub-Saharan Africa's growing animal protein sector	Enable the mainstreaming of alternative proteins into sub-Saharan African diets; Produce market-competitive rates of return on investment
Intended beneficiaries	Smallholder farmers and pastoralists	Individuals and organisations which invest capital in financial institutions	Consumers and the environment
Central problems to be addressed	Low agricultural productivity; Poverty, hunger and malnutrition among smallholder farmers and pastoralists; Lack of access to markets	Dependence on feed, meat & dairy imports; Lack of formal markets for high quality animal products	Environmental and animal welfare impacts of livestock agriculture; Limited availability of affordable alternative protein products
Factors enabling change	Investment in high quality animal feed, veterinary medicines and breeding stock; Investment in connections to markets via cooperatives and processors	GDP growth and urbanisation; Increasing presence of retail and restaurant chains in sub-Saharan Africa	Investment in scaling up production; Achievement of price parity between alternative proteins and animal products
Preferred value chains	Poultry and eggs, dairy, aquaculture	Poultry and eggs, dairy (processing only)	Alternative proteins (plant-based and in vitro meat and milk alternatives)
Value chain stages financed	Agricultural input suppliers; Aggregators and processors	Agricultural input suppliers; Vertically integrated poultry and egg farms; Aggregators and processors	Alternative protein manufacturers
Geographical focus	Ethiopia, Uganda, Tanzania, Kenya, Zambia, Mozambique, Malawi, Nigeria, Ghana	South Africa, Zambia, Kenya, Uganda, Nigeria, Tanzania	South Africa, Kenya, Nigeria, Ghana
Intended impact on livestock agriculture	Productivity of animals increases but livestock populations remain static; Smallholders and pastoralists remain the primary livestock producers	Livestock productivity and populations increase; Shift from backyard to intensive livestock production where this is profitable	Alternative protein production and consumption increases; Livestock populations remain static or expand only slightly

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I. Smallholder Intensification

Summary

- The 'smallholder intensification' vision was held by a network of philanthropic organisations, development finance institutions and impact funds pursuing shared development goals including poverty reduction, the reduction of malnutrition, and the pursuit of sustainable development.
- These investors sought to address poverty and malnutrition among smallholder farmers and pastoralists by increasing the productivity of their livestock. They therefore invested in companies supplying agricultural inputs such as veterinary medicines, animal feeds and breeding stock to small producers.
- They also financed enterprises (such as dairy and meat processors) which purchased animals or animal products from smallholder farmers before selling them on to commercial buyers or processing them into higher value products. These investments were intended to help small-scale livestock producers to secure higher prices for their produce by connecting them to more lucrative markets for processed animal products.
- Due to concerns about the environmental impacts of livestock production, most of these investors preferred to finance initiatives designed to increase the quantity of protein produced per animal rather than ones which would expand the number of animals kept by small producers. Most also avoided investing in beef production due to concerns about the greenhouse gas emissions produced by ruminant animals, and instead focused on financing dairy, poultry, egg and (to a lesser extent) aquaculture value chains.
- These investors often invested deliberately in countries and companies which purely commercial investors would consider either too risky or insufficiently profitable to finance in order to reach the poorest and most marginalised producers. As a result, they invested across much of Eastern and Southern Africa (e.g. Ethiopia, Kenya, Uganda, Tanzania and Zambia), as well as larger West African markets (e.g. Nigeria and Ghana).
- In these locations, their investments aimed to foster a distinctive value chain structure in which most animal protein is produced by smallholder farmers and pastoralists. However, these small producers are increasingly sandwiched between larger producer cooperatives or privately owned agricultural input suppliers and larger aggregators and processors which connect them to higher value markets for their produce. As such, they envisioned a future in which small-scale livestock agriculture was anchored by larger organisations acting as 'hubs' for the (relatively) large-scale provision of agricultural inputs, extension services and (in some cases) access to higher value markets.

Who?

The first of these three investor visions was shared broadly by philanthropic organisations, development finance institutions and impact funds, some of which regularly partnered with one another to invest in the same initiatives. For instance, as illustrated in Fig. 11, a DFI and a philanthropic foundation might both contribute funding to an agricultural development project or to an impact investment fund with agricultural development and food security objectives. These collaborations required agreement on the objectives of the investment, and thus reflected the existence of (and may have helped to consolidate) a shared approach to investment in protein in sub-Saharan Africa among this network of investors.

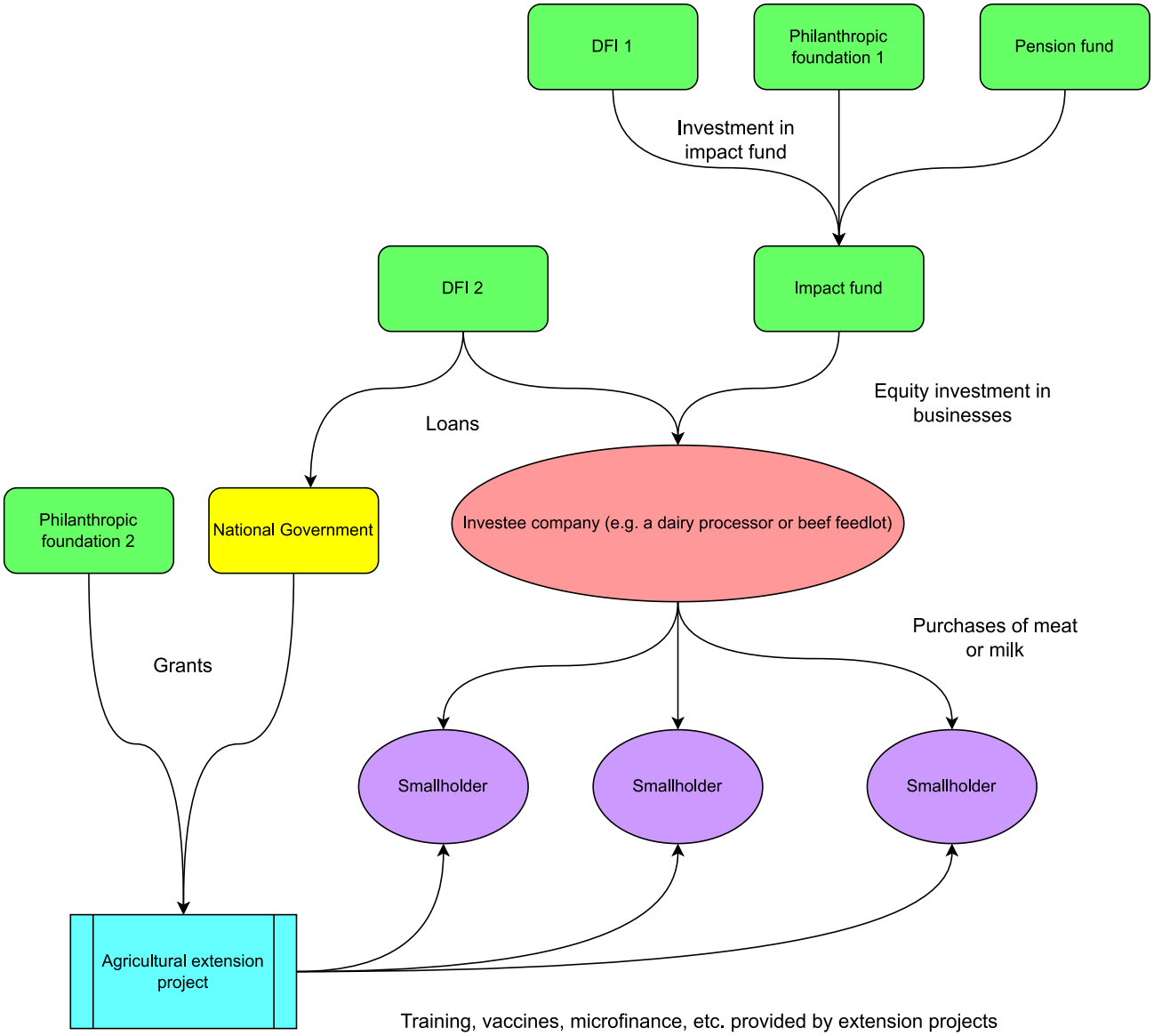

Figure 11: Example Smallholder Intensification Investment Network.

This diagram outlines the various arrangements through which members of the smallholder intensification investor network might finance animal protein production in sub-Saharan Africa. For illustrative purposes it seeks to depict all the routes through which investment might be provided and does not represent the arrangements through which any specific enterprise or value chain is funded.

One cluster of investors (DFI 1, Philanthropic foundation 1 and a pension fund) invest in an impact fund, which pools their capital and uses it to purchase shares in companies such as dairy processing companies or beef feedlots. These investors thus become indirect owners of a portion of these companies.

A second cluster of investors (DFI 2 and Philanthropic foundation 2) instead funds agricultural extension services which are provided on a non-commercial basis - either via direct grants (in the case of the philanthropic foundation) or via loans to a national government (in the case of the DFI). This agricultural extension project provides support to smallholder farmers in the form of funding for training, veterinary medicines or microfinance services. These farmers may then sell meat or milk to the processing company, enabling them to receive some of the money invested in it via the impact fund (albeit indirectly).

Reflecting this investor network's varied membership, its members used a wide range of financial instruments. While philanthropic organisations and DFIs have traditionally provided funding in the form of either grants or loans, both groups of investors increasingly also invest capital in impact funds. These impact funds then make equity investments in companies operating within sub-Saharan African protein value chains (Watts and Scales, 2020). For at least some DFIs this provides an important means of financing businesses which are too small to absorb the large loans which they would traditionally have provided:

> **"Our minimum equity investment is [$]25, 30 million, and our minimum debt's 20 million plus. That can be viewed as both an advantage or a disadvantage. We hear it from the ground that it's a bit of a disadvantage because, well, the SMEs obviously are not reachable any more for us. We do route our investments through funds, specialist funds (...) that are focused on a particular sector. And that allows us to pepper our investment sizes to a lower quantum."**
>
> ***(Interview 19, DFI)***

Some of the impact funds whose staff were interviewed had also partnered with philanthropic organisations and DFIs to provide grant-funded agricultural extension and community development services to small producers within their investee companies' supply chains. The quantities of funding invested by these different actors in any given project and the financial instruments through which they were provided might vary (and could become complicated to trace in the case of larger projects). However, the range of organisations involved, and the values and objectives which animated their investment programmes, remained fairly consistent across different countries, livestock species and sections of protein value chains.

Why?

All of these investors tended to be motivated by a common set of development goals including:

1. The reduction of poverty;
2. The reduction of malnutrition; and
3. The achievement of these goals in a socially, economically and environmentally sustainable fashion (i.e. sustainable development).

Each organisation's investments were intended to advance all three of these goals, often alongside further closely related objectives such as the promotion of gender equality. These investors argued that investment in protein production in sub-Saharan Africa should be targeted at initiatives which would improve the livelihoods of smallholder farmers and pastoralists for two reasons. First, they suggested that for many rural households poultry, cattle and small ruminants such as goats already serve as a store of wealth which can be drawn upon through selling animals during periods of economic stress. As such, investments in these livestock species were deemed to be particularly effective in increasing both the household incomes and the economic resilience of the rural poor.

Second, interviewees frequently highlighted that smallholder farmers and pastoralists are among the poorest and most socio-economically marginalised populations within African countries and therefore often suffer disproportionately from malnutrition. As such, they expected that investing in increasing their capacity to

produce animal protein would reduce rates of malnutrition through increasing their dietary protein intake. Such investments might produce this effect directly through enabling small producers and their families to consume larger quantities of animal products which they had produced themselves or indirectly through enabling them to use money earned by selling a larger volume of animal products to others to purchase a greater variety of foodstuffs.

> **"We wanted to increase productivity. If you really make sure that the markets are functioning and they can monetise their produce, that will drive the household income as well as improved nutritional outcomes. Both in terms of, you know, if they are increasing productivity, they will have surplus to consume (...) but also by monetising it they can drive dietary diversity. You know, they don't have to depend on their own production to consume."**
>
> ***(Interview 07, philanthropic foundation)***

This group of interviewees was acutely aware of the environmental impacts of livestock production and regularly discussed their concerns about the greenhouse gas emissions associated with ruminant animals, the potential impacts of overgrazing on rangelands and the land conversion footprint of animal feed production. Due to these environmental considerations they preferred to finance initiatives designed to increase the quantity of protein produced per animal rather than ones which would expand the number of animals kept by small producers. Some such interviewees suggested that their programmes were designed to drive a 'culture change' in which small producers would move away from considering their animals a store of wealth (and seeking to acquire larger herds) towards treating them as a revenue stream and attempting to maximise their income by growing and selling animals more quickly. This, they argued, would prevent the total number of animals from increasing.

Interviewees therefore often argued that focusing on increasing the productivity of livestock enabled their investments to contribute both to providing greater economic security for small producers and to satisfying sub-Saharan Africa's growing demand for animal protein without causing a commensurate increase in the negative environmental impacts of livestock agriculture. Some interviewees provided examples of past projects funded by their organisations which had achieved this goal of increasing livestock productivity without precipitating a significant expansion in the size of the herds kept by the producers involved, although they acknowledged that any given investment's ability to achieve this outcome could only be evaluated retrospectively.

> **"Through climate funds it is possible to access money to finance livestock projects, but with some very strong caveats they put in the spec. A project in which the yield per animal will increase (...) so you can produce 1,000 litres [of milk] with less animals (...) [which] means less greenhouse gas emissions, that's more attractive for a climate fund like GEF [the Global Environment Facility], GCF [the Green Climate Fund]. Rather than building the story that we're going to produce 1,000 litres through more dairy cattle. That will not go through the finance."**
>
> ***(Interview 10, DFI)***

What and Where?

These investors' emphasis on environmental sustainability also led them to focus their funding on particular livestock species. Several interviewees highlighted that while financing for cattle farming had long been a prominent component of both DFIs' and NGOs' agricultural development programmes in Africa (de Haan et al., 2001), it was becoming increasingly difficult to obtain finance to support new projects to support smallholder farmers raising beef cattle. These interviewees suggested that this shift reflected concerns over the climate impacts of methane emitted by the digestive systems of ruminant animals and the high carbon intensity of beef production:

> **"We only have one [beef] cattle project. And (...) we try to encourage the people not to grow their herds. It's to have the same size herd but more turnover, so a more efficient herd. More calves, less mortalities and therefore more sales per annum on the same size herd. (...) I'm not sure we would do it again. It's just so difficult with the climate issue. But where we have done it, it has created a huge impact, a positive impact, social impact. It's just – I think it's quite difficult now. It's quite difficult to mitigate the climate impact."**
>
> ***(Interview 16, private equity investor)***

As a result, while some interviewees argued that investment in beef cattle could benefit small producers through making their livelihoods more diversified and resilient, increasing household incomes and improving nutritional health, most had shifted their focus towards poultry and egg production and towards the raising of cattle and small ruminants to produce dairy products[2]. This pattern of financing (with the possible exception of investment in dairy production) is consistent with the Joint Multilateral Development Bank Assessment Framework for Paris Alignment for Direct Investment Operations (African Development Bank Group et al., 2021), which classifies investment in fishing, aquaculture and non-ruminant livestock agriculture as being universally aligned with the Paris Agreement's climate change mitigation goals. As such, it may in part reflect the Framework's influence on DFIs' investment decision-making.

Some interviewees highlighted that these environmental concerns – combined with the emergence of new evidence about the economic and nutritional benefits of aquaculture – had also driven increased interest in investment in small-scale aquaculture projects. However, while aquaculture projects had as a result assumed an increasingly prominent role within some DFIs' investment programmes, other interviewees suggested that they had struggled to find aquaculture projects which were large enough in scale to be investable. Some were also reluctant to finance aquaculture enterprises due to the failure of previous investments, with one interviewee highlighting that aquaculture projects could easily fall victim to disease if those involved in them were not already skilled in fish farming and did not have access to healthy breeding stock. As a result, while these investors displayed enthusiasm for investment in aquaculture, a larger proportion of their investment still appeared to be directed towards poultry, egg and dairy value chains.

These investors' objectives of improving the economic and nutritional wellbeing of smallholder farmers led them to focus their investments on two types of enterprises. First, most such organisations invested in companies

2 Because ruminant animals kept for dairy production yield milk continuously throughout their lives, these animals emit a smaller quantity of GHGs per unit of protein produced than beef cattle.

supplying high-quality agricultural inputs such as veterinary medicines, professionally mixed animal feeds and higher yielding breeds of animals[3] in the hope that making these products more affordable and available would increase the productivity of small-scale livestock producers. Second, some invested in enterprises which purchased animals or animal products from smallholder farmers and aggregated them for sale to commercial buyers or processed them into higher value products. Investment in this second group of enterprises (described variously as aggregators, offtakers or processors) was intended to 'connect' small producers to more lucrative markets for processed animal products, and thus enable them to secure a higher price for their produce.

This dual emphasis on replacing domestically produced breeding stock and animal feed with commercial agricultural inputs, and on encouraging smallholders to sell their produce via food manufacturers, retailers and foodservice enterprises operating within the formal economy instead of local informal markets, situates the smallholder intensification vision firmly within the 'value chain' approach to agricultural development. Promoted by prominent international development actors such as the World Bank Group since the late 2000s, value chain approaches are distinguished by their belief that poverty and low productivity among smallholder farmers results from isolation from formal markets in which buyers are willing to pay higher prices for agri-food products. They thus tend to focus development institutions' attention and investments on facilitating the inclusion of small producers into a 'chain' of formal enterprises – from input suppliers and processors to retailers – capable of connecting them both to manufacturers of high-quality agricultural inputs and to urban or international consumers capable of paying a higher price for their produce (McMichael, 2013).

The types of enterprises which these investors considered most vital to creating these new agricultural value chains, and thus the focus of their investments, varied between different livestock species. As Fig. 1 illustrates, investment in poultry and egg production tended to focus on companies operating feed mills (which usually sourced the crops used in their feed from local farmers), because a lack of appropriately formulated poultry feed was considered to limit the productivity of smallholders' birds. These firms often also bred, hatched and vaccinated day-old chicks (DOCs) for sale to smallholders who then reared them for meat and/or egg production. Smallholders who purchased DOCs from these companies were expected to sell both birds reared for meat and the eggs produced by layer birds within local informal markets.

3 Several interviewees acknowledged that the use of land to produce this animal feed would inevitably produce negative environmental impacts of its own, and some tried to mitigate these through using locally sourced feed crops grown by smallholder farmers on existing agricultural land in rotation with their established crops. In so doing, these investors hoped to avoid the use of animal feed produced from commodities such as soy which might be implicated in driving land conversion elsewhere in the world. These interviewees did not claim that this entirely nullified the impact of introducing more feed-dependent breeds of animals. However, they suggested that in combination with the efficiency and productivity gains enabled by higher yielding animal breeds it reduced them to a level which was acceptable given the benefits of their investments to both producer livelihoods and nutrition.

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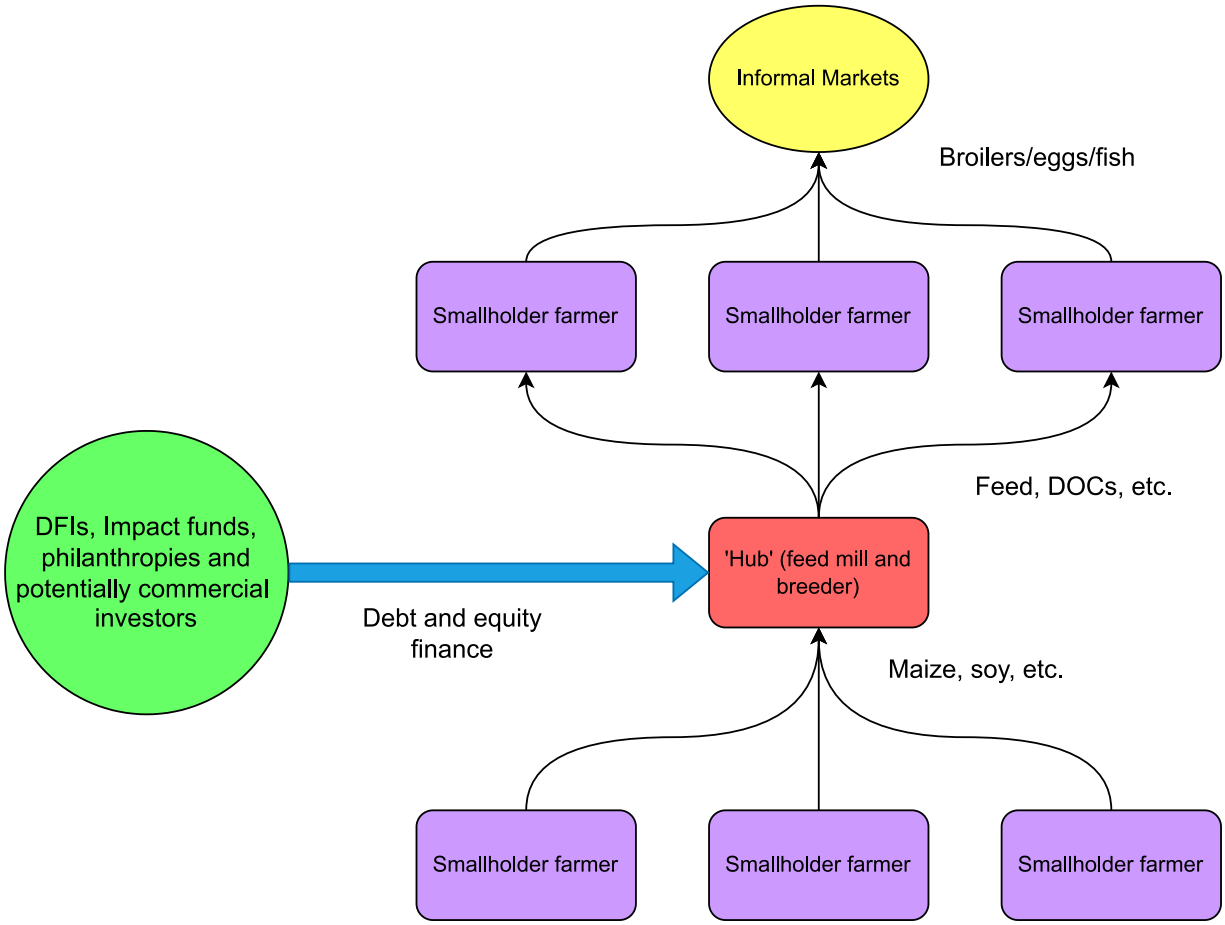

Figure 12: Destination of Smallholder Intensification investment: poultry, egg and aquaculture value chains

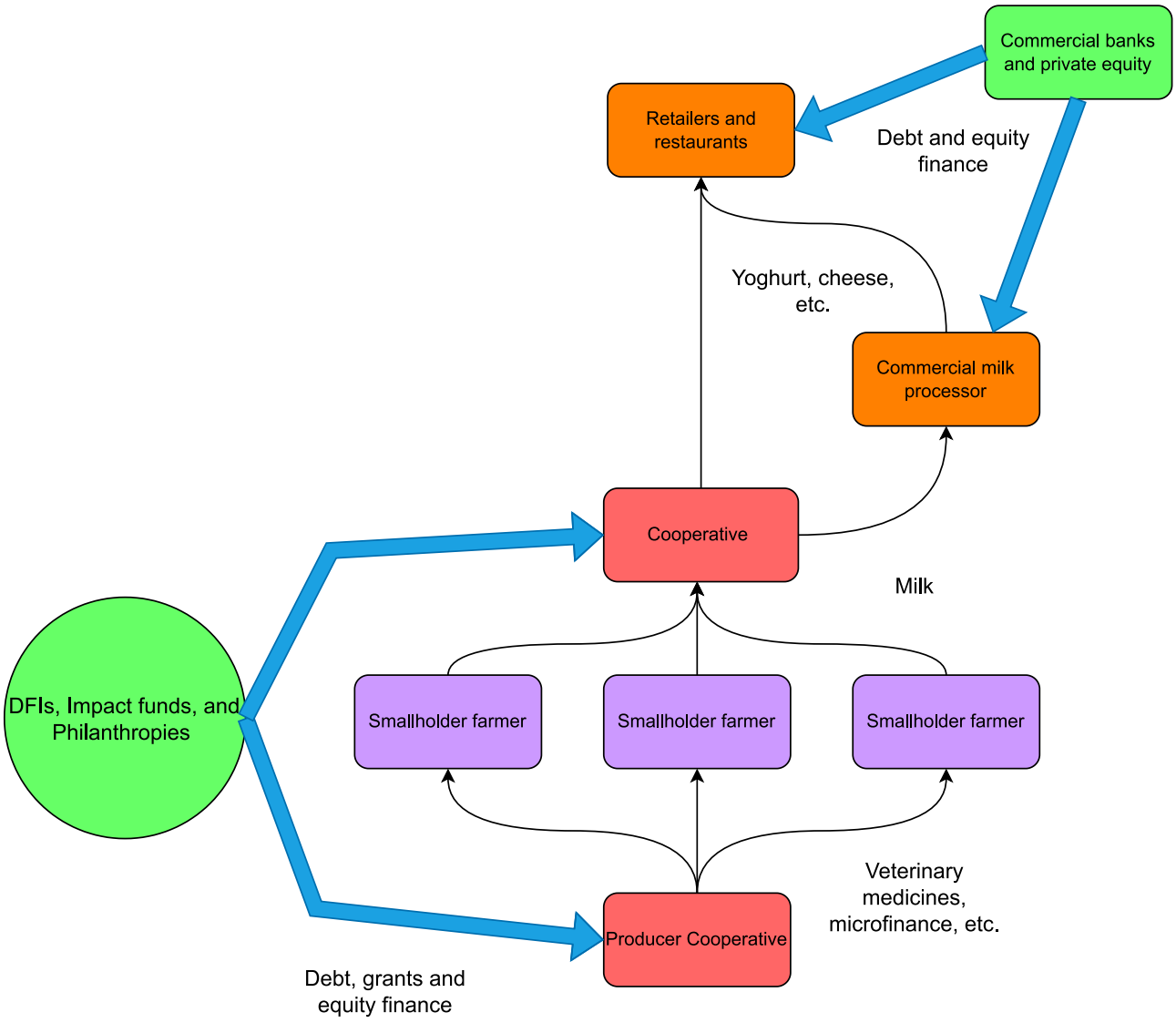

Figure 13: Destination of Smallholder Intensification investment: dairy value chains.

These investors often invested deliberately in countries and companies which purely commercial investors would (as discussed in the next section) consider either too risky or insufficiently profitable to finance. In doing so, they hoped to produce a greater positive impact both through benefitting the poorest and most marginalised producers and through enabling agricultural enterprises with limited access to other sources of finance to establish themselves and expand. This imperative to maximise the 'development impact' of their investments did have to be balanced against the risk that projects in the most politically and economically fragile countries would fail due to conflict or political instability, a lack of reliable markets for animal products or events such as environmental shocks. However, these investors' relatively high tolerance for risk had enabled them to apply this investment approach across much of Eastern and Southern Africa. By contrast, some interviewees had avoided investing in West and Central Africa (with the exception of larger West African markets such as Ghana and Nigeria) because they perceived many countries within these regions as presenting riskier and more challenging business environments for investors for reasons including conflict, poor governance and political instability.

> **"Relatively speaking we operate in more fragile economies than the other financial institutions. (...) We obviously go into projects where commercial capital is challenged and our contribution is [to] provide catalytic capital that down the road will help mobilise further capital. But there are some countries that stand out more than others that we really want to do – big change in Nigeria, for instance, but it also happens to be one of the most challenging economies to do business in. We're keen on Nigeria. Egypt's also an area we need to do a lot more in, Kenya, Tanzania. (...) it's that growth potential, the size of the development impact. If you look at Nigeria, for instance, [it's] 200 million people with 30 per cent unemployment and maybe half the population living below the poverty line. So it's a very strong case for us to be there."**
>
> ***(Interview 19, DFI)***

In these locations, their investments appeared to be designed to produce a distinctive value chain structure. In the value chains envisioned by such investors most animal protein is produced by smallholder farmers and pastoralists. However, these small producers would be sandwiched between larger agricultural input suppliers (in the form of producer cooperatives or privately owned companies) providing agricultural extension services, and larger aggregators and processors connecting them to higher value markets for their produce.

Interviewees identified the poultry feed and input supply sectors in countries such as Zambia, Tanzania and Uganda as having undergone the forms of growth and consolidation associated with this investor vision – with a small number of firms (often financed initially by DFIs and/or impact investors) now supplying most small poultry farmers. Meanwhile, they suggested that dairy cooperatives had become particularly established in East African countries such as Kenya, Uganda and Ethiopia, with a few attracting thousands of members and growing large enough to develop their own processing plants and brands of milk products. Small-scale livestock agriculture was thus anchored by larger organisations which acted as 'hubs' for the provision of agricultural inputs, extension services and (in some cases) access to higher value markets in what some interviewees termed the 'hub-outgrower model.'

How?

This group of investors' shared theory of change can be summarised loosely as follows. Adherents of the smallholder intensification vision believe that smallholder farmers and pastoralists currently lack access both to high quality agricultural inputs and to formal value chains which are capable of connecting them with customers who will pay an attractive price for their products. They therefore either keep their animals primarily as a store of wealth or sell the foods which they produce at low prices via local informal markets. Because these animals grow slowly and live for a long time, large quantities of land and feed are required to produce each unit of animal protein. In consequence, such investors argue, these production systems are economically and (more importantly) environmentally inefficient.

Adherents of the smallholder intensification vision argue that investing in providing small producers with easier and more affordable access to high quality agricultural inputs will enable their animals to grow more quickly and to produce more meat, milk and eggs. This will improve small producers' nutritional health by increasing their household incomes and/or domestic consumption of animal protein. Meanwhile, investment in enterprises which connect small producers with higher value markets – such as cooperative-owned milk aggregation stations and processing plants or beef feedlots – will enable them to realise more value per unit of animal protein produced.

This will increase both the productivity of small producers' animals and the value of their products. It will thus enable them to reinvest either in further increasing the productivity of their animals or in meeting other household expenses such as school fees for children.

Such investors therefore suggest that these investments will reduce both malnutrition and poverty, while enabling small producers to secure and improve their existing position within sub-Saharan African economies and food systems. They will also reduce the quantity of land and feed required to produce each unit of animal protein because animals will live shorter lives and convert feed more efficiently into protein. As a result, they will enable more animal products to be produced to satisfy expected future growth in sub-Saharan Africa's appetite for protein without creating a commensurate increase in the environmental footprint of animal agriculture.

II. Protein for Profit

Summary

- The 'protein for profit' vision was held by private sector financial institutions such as private equity funds and commercial banks, which invested in protein production in sub-Saharan Africa for entirely financial reasons. These investors only financed companies which they expected would produce market-competitive returns on their investments and would not pose an unacceptable risk of capital loss.
- Forecasts of rapid population and economic growth had convinced these investors that markets for animal protein in sub-Saharan Africa would grow rapidly over time. They therefore perceived companies which produced and processed animal products that met the food quality and safety standards set by international restaurant chains and food retailers as offering attractive investment opportunities.
- However, the perceived risks of investing in sub-Saharan Africa limited their willingness to finance protein production within the region. These investors typically financed only poultry and egg production because these value chains required the smallest initial investments to establish and (due to the short lifespans of the animals involved) were least exposed to political or economic shocks during the animal production cycle.
- Unlike proponents of the smallholder intensification vision, these investors are willing to replace the smallholder poultry producers within their value chains with vertically integrated production systems if this becomes commercially viable. They often finance vertically integrated broiler and layer chicken farms in wealthier countries with established food retail and restaurant chains, such as South Africa.
- ome interviewees had recently also begun to invest in companies supplying feed and DOCs to smallholder farmers in countries such as Kenya, Uganda, Tanzania and Nigeria where demand for poultry meat and eggs is growing rapidly. The animal protein value chains in which they invest therefore sometimes overlap with those created by the Smallholder Intensification vision. However, it is not clear whether this represents a convergence between the smallholder intensification and protein for profit visions or a more opportunistic accommodation between them.

Who?

A second group of investors made up of private equity funds, and of both local and international commercial banks, was pursuing a more purely profit-driven vision for the future of protein in sub-Saharan Africa. These institutions tended to use one of two sets of financial instruments. Commercial banks typically extended loans to animal protein companies, while private equity firms purchased equity investments in them. As a result, while banks and private equity firms often invested in the same companies, they generally did so independently of one another.

Why?

This group of interviewees tended to invest in protein production in sub-Saharan Africa for entirely financial reasons and would therefore only finance companies which they expected would produce market-competitive returns on their investments and would not pose an unacceptable risk of capital loss. They had come to believe that some animal protein producers in sub-Saharan Africa could provide attractive investment opportunities based primarily on the forecasts of future population and economic growth discussed at the beginning of this chapter. They (like other investors) expected that this would 'naturally' cause markets for animal protein, and the revenues of companies producing and processing animal products, to grow rapidly.

> **"If you look to [growth in] the consumption of meat and poultry, it's 85% emerging markets. And at the moment it's a lot about Asia, so 65% is Asia. But if you look forward, longer term (...) Africa is actually the region where I think most focus will be because of the fast-growing population there, and that raises of course big opportunities (...) It's urbanisation, it's a big population. And then you need to create, in some way, a food value chain for these countries"**
>
> ***(Interview 14, commercial bank)***

One interviewee placed particular importance on the growing presence of international restaurant chains and food retailers within many sub-Saharan African countries. They argued that this reflected the emergence of a middle class prosperous enough to consume more animal protein in the form of restaurant meals and packaged food products, and that these firms' expansion across the region could therefore be expected to continue over time as economic growth proceeded. This made investment in companies supplying animal protein suitable for international restaurant and retail chains an attractive investment opportunity.

> **"Because of the rising middle class, you see that retail and (...) restaurant chains, they are developing quick in Africa. And these companies, they need more modern or more solid, homogenous supply (...) if you have more retailers, restaurant chains, that makes it also more interesting. That's actually one of the main triggers when international investors get interested in investing in processing."**
>
> ***(Interview 14, commercial bank)***

However, interviewees also noted that most of the animal products consumed in sub-Saharan Africa were produced by smallholder farmers and pastoralists and distributed through informal markets. Some argued that this meant that successful commercial animal protein producers and processors might be able to gain a 'first mover advantage'. This, they believed, would enable them to expand rapidly, capture a large share of the market both in their home nation and in neighbouring countries and out-compete or marginalise later entrants to these markets. These interviewees suggested that such firms therefore had the potential to produce a highly attractive financial return for their investors.

What and Where?

Despite these opportunities, these investors' willingness to finance protein production in sub-Saharan Africa was limited sharply by the perceived financial risks associated with investing in the region. The uneven distribution of these perceived risks across different countries and value chains shaped the focus of their investment activities in several important ways. First, these investors regarded most sub-Saharan African countries as being more likely than many other locations to experience events – such as civil unrest, armed conflict, or state expropriations of private property – which might lead to the failure of investee companies and the loss of their capital (see also Ouma, 2020; Watts and Scales, 2020).

> **"So, for a pension fund to invest in Africa (...) they'll be concerned about political risk (...) if there's some sort of political event, like a war or an expropriation event. (...) So Zimbabwe, is uninvestable. [Also] The Congo, Central African Republic, etc. Chad. We tend to be [in] southern and eastern [Africa], which is okay (...) if you want to bring institutional money to Africa, you need to actually protect them from a risk point of view. There's a certain – in our minds – a level of risk we can't go beyond. If they have a good experience they will put in more money, perhaps with other fund managers, and in the long-run that's what Africa needs."**
>
> ***(Interview 16, private equity investor)***

Such concerns led these investors to focus on those countries which they perceived to have the strongest legal protections for private investments and the most stable political systems. This often appeared to channel their investments towards Eastern and Southern African countries such as Kenya, Tanzania, and Zambia. This effect was reinforced by an expectation (apparently formed through analysis of past nutritional transitions in other countries) that markets for animal products would expand fastest in countries experiencing rapid economic growth where protein consumption per capita was currently low:

> **"If you look at the Asian experience (...) as per capita income rises, so does meat consumption per capita in kilos. But it's particularly sharp under $5,000 income [per capita]. So at the very poorest, as you have a very small [income] increase, you get a very rapid increase in meat consumption. (...) In Tanzania, Uganda, Kenya, you've got a fast growing economy. Low incomes per capita. Very – unusually, I think – low consumption of chicken or eggs per capita and issues as a result. You've got protein deficits. Animal protein, certainly. So it's both an opportunity for impact and return."**
>
> ***(Interview 16, private equity investor)***

Meanwhile, interviewees argued that a lack of high-quality locally produced agricultural inputs such as breeding stock and animal feed left producers in many sub-Saharan African countries dependent on imported agricultural inputs, which could change rapidly in price as currency exchange rates and the global supply of key goods fluctuated. These factors, combined with competition from imported animal products (including European dairy products in West Africa and Chinese tilapia in Zambia), were held to make both the size and the profitability of markets for animal products in many sub-Saharan countries highly unstable and unpredictable. These overlapping financial risks led commercial investors to invest almost exclusively in poultry and egg production. Due to the short lifespans of the animals involved, these value chains were deemed to be least exposed to the risk of unexpected political or economic events occurring during the animal production cycle and to require the smallest initial investments.

> **"Beef is a preferred product for sure, and there are some investors in Africa, international ones, but it's more for export I think. And the problem is the long payback time, I would say (...) it's quite risky, you know, if you have more than a year production cycle. The market can be changed completely in a year. And the chicken, you can fine tune that in a couple of weeks, you know, six weeks. If the market becomes worse, you can place less chickens in farms."**
>
> ***(Interview 14, commercial bank)***

This group of investors were also reluctant to finance smaller and newer African animal protein businesses. This partly reflected a mismatch in scale, with the loans and equity investments requested by newly established African food businesses often being too small for commercial banks or private equity funds to consider them an attractive investment opportunity. However, it also reflected a broader concern that newer and smaller businesses were more likely to fail and thus represented riskier investments. These investors therefore preferred to finance more established firms with strong track records of creditworthiness. They were especially attracted to multinational firms which could raise finance on international capital markets at a low cost and whose revenues from other regions could compensate for any losses incurred by their operations in sub-Saharan Africa.

As a result, commercial investors tended to finance only the largest companies operating in animal protein value chains. These included dairy processing companies, vertically integrated producers both of broiler chickens and of eggs, and established suppliers of agricultural inputs to poultry and egg producers. Several interviewees noted that this meant that few sources of finance were open to animal protein producers which had grown too large to rely upon the grants and micro-loans provided by NGOs and micro-finance institutions (MFIs) but remained too small to attract investment from commercial banks and private equity funds. These interviewees suggested that under-financing of this 'missing middle' of enterprises with financing needs of between roughly $50,000 and $1-2 million was constraining the development of domestic protein producers in a number of sub-Saharan African countries.

Commercial investment in protein production in sub-Saharan Africa therefore appears to be heavily focused on the production of broiler chickens and eggs – and especially of poultry feed – in Southern African countries which are perceived to be politically stable and possess established food retail and restaurant chains. In wealthier countries such as South Africa, and in countries such as Zambia where contracts are available to supply animal products to mining and oil production facilities (whose workforces often represent large concentrations of well remunerated consumers), these investors often finance vertically integrated broiler and layer chicken farms. However, some interviewees highlighted that they have recently also begun to invest in companies supplying feed and DOCs to smallholder farmers in countries such as Kenya, Uganda, Tanzania and Nigeria where demand for poultry meat and eggs is growing more rapidly. They suggested that such investments are attractive partly because these businesses have built up a proven track record of profitability. However, they are also perceived to

provide a firm foundation for future expansion into vertically integrated broiler and egg production should poultry value chains begin to formalise in these countries as they have in Southern Africa.

In such settings the strategies of this group of investors resemble those of proponents of the smallholder intensification vision in viewing agricultural input suppliers as the foundation for the development of poultry and egg value chains. However, these investors differ from those adhering to the smallholder intensification vision because they do not view increasing the profitability and productivity of smallholders as the primary objective of their business. Instead, they are willing to replace the smallholder poultry producers operating within their value chains with vertically integrated production systems if this becomes commercially viable.

Some interviewees also identified dairy processing companies in East and West Africa as a secondary site of investment for this group of investors. Such firms are attractive to international investors because they may achieve considerable scale while continuing to purchase milk purchased by smallholder farmer cooperatives, and some are owned by international processors. Commercial investors largely appeared to avoid other forms of animal protein production – including aquaculture and the raising of beef cattle – on the grounds that they posed unacceptable financial risks.

How?

This group of investors' theory of change can be summarised roughly as follows. As both populations and economies grow across sub-Saharan Africa, these investors expect its middle class – which can afford both to consume larger volumes of animal protein and to purchase food from more expensive sources such as supermarkets and restaurant chains – to expand rapidly. They believe that this will enable retail and restaurant chains to expand across sub-Saharan Africa. Such businesses will in turn create demand for high quality animal protein products which can be sold at higher and more stable prices than would be available in local informal markets and in sufficient quantities to enable producers to benefit from economies of scale.

Through investing in poultry, egg and animal feed production in sub-Saharan African countries which display rapid economic growth, high political stability, low exposure to animal protein imports and high availability of animal feed, these financial institutions aim both to enable and to profit from the expansion of the world's fastest-growing markets for animal protein. Through investing in the expansion and formalisation of poultry, egg and animal feed production (and of dairy processing companies), they seek to increase the efficiency of these firms and the quality of their products. This, they believe, will enable their investee companies to secure a large market share, and specifically to secure contracts to supply retail and restaurant chains with animal products. In so doing, commercial investors seek both to achieve an attractive rate of return on their investments in the short term and to secure a dominant position in industries whose size and profitability is expected to grow rapidly over the coming decades.

When Two Visions Become One?

While this report presents the Smallholder Intensification and Protein for Profit visions as animating separate investor networks, the animal protein value chains associated with them do sometimes overlap. As noted above, milk processing companies financed by commercial banks are often the main customers of producer cooperatives funded by DFIs, philanthropic organisations and impact funds. Meanwhile, both groups of investors appear to be increasingly involved in financing companies which supply feed and DOCs to smallholder poultry producers (with private equity funds showing growing interest in acquiring larger firms employing this model). This raises questions about whether these investors really hold two distinct visions, or whether they simply represent different facets or stages of a single process of value chain development.

Importantly, impact funds with investments in companies supplying agricultural inputs to smallholder farmers often aimed explicitly to 'exit' from successful investments through selling these companies to purely commercial private equity funds. To this extent, the intended 'end point' of many investments made by proponents of the smallholder intensification vision appears to be the establishment of profitable companies which can be transferred to the ownership of more commercially minded investors (as suggested by Watts and Scales, 2020). A partner in one impact fund highlighted that an important element of his firm's mission was to enable emerging local businesses to grow large enough to access commercial sources of finance:

> **"I think the key role is, we fund projects that are not commercially bankable. So they can't go to the banks. They have no securities and things (...) when we make investments and it comes to time for us to exit, we are also a source of investments for the larger private equity funds."**
>
> ***(Interview 17, impact investor)***

However, another interviewee noted that relatively few private equity firms were actually willing to invest in agricultural and food businesses in most sub-Saharan African countries (as noted in Ouma, 2020; Watts and Scales, 2020). It was therefore somewhat unclear how common it was for these investment visions and value chains to converge in practice:

> **"Africa will raise or do deals of a value equal to 4% of the entire private equity commercial business that's out there. Of that, what comes to East Africa is maybe 10% or maybe 15%. The rest will go to South Africa, Nigeria (...) There is no sufficient pipeline [of investable businesses] to really attract, you know, people writing cheques of forty million US dollars, twenty million, to agriculture in this market. So we're still writing cheques below that, maybe ten, fifteen [million dollars], which doesn't attract big funds to set up operations here."**
>
> ***(Interview 18, impact investor)***

Even when private equity firms did acquire businesses established by the Smallholder Intensification network, it was often unclear whether these investors expected their new owners to maintain their focus on serving small producers and on increasing productivity without expanding animal populations over the medium to long term. However, some such interviewees appeared to assume that increased private sector investment into African animal protein supply chains would eventually facilitate the further commercialisation and intensification of protein production. Thus, one interviewee employed by a philanthropic organisation suggested that:

> **"Our goals are, you know, agricultural development goals. It's driving inclusive agricultural transformation (...) if you drive productivity and create economic growth, the farm labour will transfer from farm primary production to off-farm labour and then outside. And the agricultural labour will also transfer to a higher value in a service, or manufacturing, or something like that."**
>
> ***(Interview 07, philanthropic organisation)***

This suggests that although this organisation's investments in increasing agricultural productivity might be intended initially to increase the household incomes and nutritional health of small producers while maintaining their place within African food systems, these processes might eventually lead to the consolidation of livestock production in the hands of larger farmers and processing companies. If so then the future envisioned by proponents of the smallholder intensification vision might be expected to merge over time into that articulated by adherents of the protein for profit vision. This would represent a significant change in the purpose of investment in these firms, since it might be expected to entail both a shift away from the smallholder intensification vision's focus on supporting small producers and an abandonment of its commitment to raising animal protein production through increases in productivity rather than growth in livestock populations. This was the expectation of one interviewee employed by an agricultural research organisation:

> **"Despite the movement to have modern poultry industries in these countries, the backyard system is still dominant (...) and the productivity of these can be enhanced by better selection amongst the indigenous breeds (...) this is seen as an intermediate avenue of getting more poultry into consumption. It is likely that the industrial poultry system will overtake this, maybe in twenty or thirty years' time. But in that period of time, there is a great opportunity to improve those [backyard] systems three-, or four-, or five-fold."**
>
> ***(Interview 15, agricultural research organisation)***

It was not always clear whether proponents of the Smallholder Intensification vision shared this set of expectations about the long-term outcomes of their investment strategies. As a result, questions remain about whether the growing involvement of commercial banks and private equity funds in supplying agricultural inputs to small livestock producers represents a convergence between the smallholder intensification and protein for profit visions or a more opportunistic accommodation in which their differences are temporarily put aside. Moreover, while these initiatives appear to have had some success in attracting commercial investment into agricultural input suppliers and processing companies, especially in larger and more economically stable countries in Eastern and Southern Africa, it remains unclear how widely or rapidly this will be replicated elsewhere. While addressing this empirical question was beyond the scope of this report, it should be considered a priority for future research due to the far-reaching implications of any such shift both for the position of small producers in African food systems and for the likely future trajectory of livestock populations.

III. Protein Diversification

Summary

- The 'protein diversification' vision was held by a small group of mission-driven venture capital funds based in Europe and North America and by African alternative protein manufacturers. This vision remains outside the financial mainstream and the volume of investment currently associated with it is likely extremely small.
- Interviewees who held this vision shared other the investors' assumption that protein consumption would grow rapidly across sub-Saharan Africa over time. However, they believed that for environmental and ethical reasons this demand should be satisfied not through the expansion and/or intensification of animal protein production but through the introduction of alternative protein products into the region's food system.
- These investors typically did not finance any form of animal protein production and invested exclusively in startup firms producing alternative proteins. There was also little evidence that they were financing the wider value chains which might support alternative protein manufacturers – e.g. farmers growing crops such as legumes or restaurants and retailers which might stock their products. Their investments therefore appeared to be concentrated in the financial and technology hubs of South Africa.
- Such investors believe that if alternative protein producers can sell their products at a price similar to or lower than that of animal products then many sub-Saharan African citizens may choose to augment their consumption of animal proteins with plant-based, in vitro, insect-based or fermented alternatives. They expect that their investments will enable alternative protein manufacturers to scale up production (and reduce production costs) sufficiently to make their products price competitive with animal proteins.
- These 'vegan venture capitalists' appear to be the only significant source of investment to which sub-Saharan African producers (or aspiring producers) of alternative protein products currently have access. Perhaps partly as a result, African producers of alternative proteins currently appear to be operating on a relatively small scale.
- The author found no evidence that these (or other) investors were actively financing the cultivation of protein crops such as beans and legumes for human consumption in sub-Saharan Africa. The only interviewees to discuss investing in such crops during interviews were impact and private equity investors with interests in animal feed production, some of whom had encouraged smallholder farmers to begin cultivating soy for use in animal feed.

Who?

The final investor vision identified during this project is held primarily by a small (and unusual) group of self-described mission-driven venture capital funds based in Europe and North America and by the African alternative protein manufacturers in which they invest. While this vision motivates and mobilises a highly distinct network of investors and protein production enterprises which displayed little overlap with those described above, it remains outside the financial mainstream and the volume of investment activity associated with it is likely to be extremely small. One DFI interviewed during this project is currently exploring the possibility of making equity investments in African companies producing plant-based protein products. However, it had not

yet made any such investments and was not aware of any other DFIs with plans to invest in alternative proteins. This reluctance among DFIs to invest in plant proteins may partly reflect uncertainty about the impact of any dietary shift towards alternative proteins on the livelihoods of small-scale livestock producers and thus about its alignment with their development objectives.

> **"It's a very important point on the inclusivity. We need to really work that out, because that alternate protein has to be (...) tied up with a robust agricultural hinterland which uses, whatever, a contract farming model, a hub and spoke model, with pockets of smallholders (...) that directly benefit from the raw material supply. And everything has to be done at scale, and at the lowest cost, to make it affordable because (...) it should be primarily target for the local populations."**
>
> ***(Interview 19, DFI)***

Because venture capitalists were the only investors actively financing this vision, funding for alternative protein startups was provided largely through equity investments. Interviewees noted that the equity investments which they provided to African alternative protein companies were significantly smaller in size than either the equity investments often provided to their counterparts in Europe and North America by venture capitalists or the loans available to larger animal protein producers from commercial banks.

Why?

While interviewees who held this vision shared other investors' assumption that demand for protein would grow rapidly across sub-Saharan Africa over the coming decades, they believed firmly that this demand could not (and should not) be satisfied solely through the expansion of animal protein production.

> **"There is talk about, you know, protein deficiency in Africa. It cannot be covered with animal protein only, there has to be a mix, you know. There will be more animal protein, but it can't just be done by animals. There has to be... probably insects, but plant protein is probably one of the cheaper ways (...) From an investor point of view, I think people see the opportunities. (...) Africa's doubling its population, people will need to eat and the food cannot just come from animals."**
>
> ***(Interview 04, alternative protein company founder)***

These interviewees argued that it would be both ethically preferable and more environmentally sustainable if much of this expected future demand for protein were satisfied through alternative protein products. They were therefore investing in startup firms producing either plant-based meat and dairy alternatives or animal proteins produced through in vitro cultivation of animal cells and precision fermentation technologies. Like other venture capitalists, these investors expected to receive a competitive rate of financial return on their investments.

However, they were unusual in that their decisions appeared to be motivated less by commercial considerations than by a desire to limit the expansion of livestock agriculture in sub-Saharan Africa through increasing the production and consumption of alternative protein products.

> **"We quickly knew that in the beginning, [the company] has to be vegan-friendly (...) there are these investors that really, particularly want to fund alternative proteins, you know? And they were most responsive (...) we have nine different investors and, I mean, with different sizes of tickets. Three of them are not really vegan investors, you know, but the other six are. (...) I think in total money also, most of it comes from them. Like, 80% comes from vegan investors."**
>
> ***(Interview 04, alternative protein company founder)***

These ethical and environmental goals appeared to be the main reason why these 'vegan venture capitalists' had chosen (unlike most of their peers) to invest in African food technology companies. The co-founder of one African startup producing plant-based meat highlighted that such companies tended to fall into a funding gap lying between two distinct groups of investors. African banks and private equity funds tended to refrain from investing in alternative protein companies because they regarded them as being excessively risky investments. Meanwhile, most of the European and North American venture capital and private equity funds which had financed alternative protein startups in their home markets tended (as discussed previously) to regard sub-Saharan Africa as an unacceptably risky location in which to invest. It therefore appeared that these 'vegan venture capitalists' were motivated to invest in African alternative protein startups because they regarded the transformation of diets and food systems in the world's most rapidly growing markets for protein away from meat and dairy as being a sufficiently important normative goal to override the risk of financial loss.

These 'vegan venture capitalists' appear to be the only significant source of investment to which African producers (or aspiring producers) of alternative protein products currently have access. One interviewee considered this an important constraint on his firm's growth potential because it restricted him to a narrow pool of potential investors, most of whom had only relatively small sums of capital available to invest (with each venture capitalist typically contributing a sum in the tens to the low hundreds of thousands of US dollars).

What and where?

These investors typically did not finance any form of animal protein production (including aquaculture), and instead invested exclusively in startup firms producing alternative proteins. In order to assess the likely geographical focus of their investments, the author analysed the databases of alternative protein manufacturers maintained by the Good Food Institute and Crunchbase in order to establish how many such firms were active in sub-Saharan Africa and where they were headquartered[4]. This analysis identified ten alternative protein producers as being active in sub-Saharan Africa. Six of these firms were located in South Africa, two were

4 No similar analysis of the likely geographical location of the animal protein enterprises financed by the other two investor networks could be undertaken. This is because sub-Saharan Africa's meat, dairy and animal feed sector is far larger, more fragmented and more geographically dispersed than its incipient alternative protein industry. As a result, the availability of data on animal protein enterprises in sub-Saharan Africa is far more variable. As such, no single database of privately owned animal protein companies exists and constructing such a database was beyond the scope of this research.

headquartered in Kenya, one was based in Nigeria and one was in Ghana. As such, it seems likely (as Fig. 14 illustrates) that investments made by these 'vegan venture capitalists' will display a high degree of geographical concentration around the financial and technology hubs of South Africa.

There was little evidence that this group of investors was actively financing other elements of the wider value chains which might support these alternative protein manufacturers – for instance farmers growing protein crops such as legumes or restaurants and retailers which might stock their products. Perhaps as a result, even African producers of more technologically proven alternative proteins such as plant-based meats currently appear to be operating on a relatively small scale and are predominantly targeting their products at urban consumers motivated by anxieties about health and food safety in relation to animal protein. One interviewee also noted that the fragmentation of the restaurant and food retail sectors in many sub-Saharan African counties – and their limited distribution infrastructures for chilled and frozen products – makes expansion into new regions and countries difficult and further constrains their ability to scale up production.

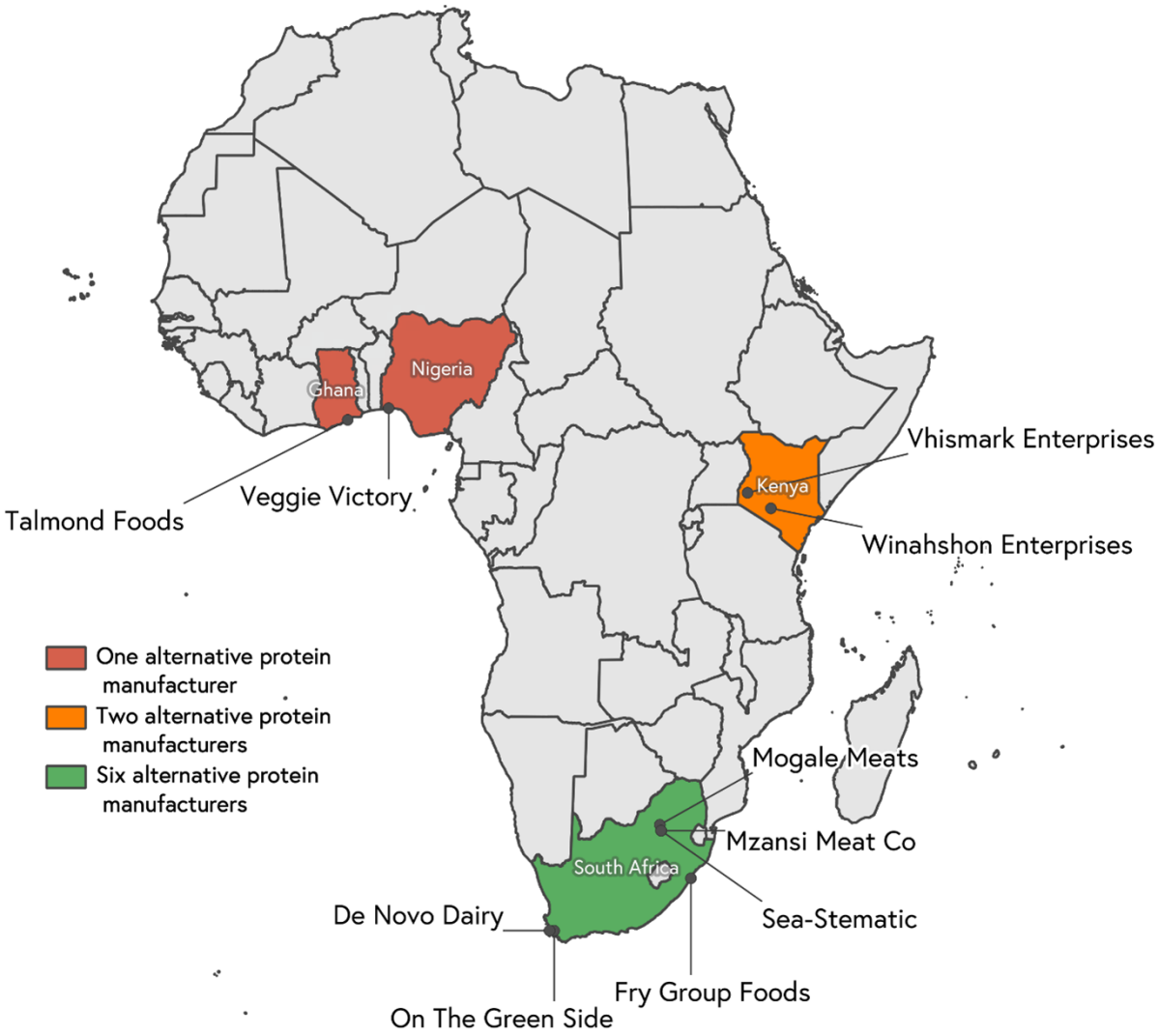

Figure 14: Map of alternative protein manufacturers within sub-Saharan Africa.
Data source: Good Food Institute and Crunchbase.

How?

These investors' theory of change could be summarised as follows. Adherents to the protein diversification vision expect population growth and economic expansion to drive a rapid increase in demand for protein in sub-Saharan Africa over the coming decades. While voluntary adoption of vegetarian and vegan diets is currently rare within the region, they believe that the environmental impacts of livestock agriculture mean that it will not be possible to satisfy future demand for protein sustainably by increasing production of animal products. They also observe that high rates of poverty mean that many people's decisions about which foods to purchase and consume are acutely price-sensitive. As a result, these investors believe that if alternative protein producers can sell their products at a price similar to or lower than that of animal products then a substantial proportion of sub-Saharan African citizens may choose to augment their consumption of animal proteins with plant-based, in vitro, insect-based or fermented alternatives. They therefore hope that African consumers on constrained budgets might be persuaded to supplement their intake of animal products with price-competitive or cheaper alternative proteins.

> **"I strongly believe that the protein demand on this continent cannot just be covered by more livestock, it has to be a mix of several things, you know? Of course I wish it would be 100% plant-based, but that is utopia. But there will be more plant-based protein, probably also insect protein. I don't know, maybe cultured meat. (...) So for me it's going to be a mix and even if plant-based has, whatever, a 5% share, [that's] good enough. Not good enough from an ideological point of view, but from a business point of view, that's already huge."**
>
> ***(Interview 04, alternative protein company founder)***

Adherents to this vision expect that investment in alternative protein manufacturers will enable these companies to increase their scale of production (and to reduce production costs) sufficiently that their products become price competitive with animal proteins and secure a significant share of markets for protein in sub-Saharan Africa. This will enable investors in these firms to receive an attractive financial return on their investment, while also satisfying the region's growing demand for protein and preventing the environmental damage associated with a large increase in livestock populations.

What about plant proteins?

Protein crops such as beans and legumes are consumed widely across sub-Saharan Africa, and are grown by many of the region's smallholder farmers, and there is anecdotal evidence that some development funders are beginning to show interest in promoting the cultivation of soy for human consumption. However, the interviews conducted during this project found no evidence that adherents of the protein diversification vision (or indeed other investors) were actively financing the cultivation of these crops for human consumption.

Indeed, the only interviewees to discuss investing in such crops during interviews were impact and private equity investors with interests in animal feed production, some of whom had encouraged the smallholder farmers who served as their outgrowers to begin cultivating soy for use in animal feed production. One impact investor whose firm held equity investments in firms operating across several Southern and Eastern African countries highlighted that soy was neither part of a traditional part of local diets nor an established element of agricultural rotations in these locations. As such, local smallholders had only begun to cultivate soy after construction of a feed mill created a local market for this crop:

> "So the quality of the feed that was available to the [poultry] farmers was really poor and particularly the protein content of the feed. Because nobody grew soya beans in Tanzania, pretty much, before we arrived (…) There's virtually no commercial farms in Tanzania and these smallholders are producing maize, mono-cropping the maize. But we built a soya processing plant, which is the market for soya beans. (…) Then we reached out to some more of the farmers and said, "Why don't you bring it into rotation for maize?" (…) soya's good for smallholder farmers. It's high value per tonne. You're reducing disease pressures by stopping the mono-cropping. And you rotate the maize for the soya and then you're fixing the nitrogen."
>
> *(Interview 16, impact investor)*

This interviewee was proud of the role that their investments in soy processing had played in creating a local animal feed industry. They highlighted that the cultivation of soy both returned nitrogen to the soil (reducing the need for smallholders to apply artificial fertilisers) and removed the need for animals to consume imported feedstuffs whose production might otherwise drive deforestation and land conversion elsewhere in the world. However, it appears that for them and their peers protein crops such as legumes remain primarily a component of attempts to satisfy sub-Saharan Africa's appetite for protein through the intensification of small-scale livestock production, rather than forming the basis of any distinctive investor vision or programme of investment. While the cultivation of these crops might serve as a means of increasing the sustainability of animal proteins (and of smallholder arable agriculture), they were not perceived to provide a distinct environmental or dietary solution in their own right.

6. National Subsidies and Global Markets

Summary

- This report focuses exclusively on investment in protein production within sub-Saharan Africa itself. However, protein producers elsewhere in the world often receive far larger volumes of finance than their sub-Saharan African counterparts and investment outside the region shapes sub-Saharan Africa's food system in important ways.
- Interviewees often highlighted the role of government subsidies to meat, milk and animal feed producers in other parts of the world in shaping global trade in meat and dairy products. For instance, in 2020 OECD Member States provided $50.1bn in Producer Single Commodity Transfers (SCTs) to meat and dairy producers. Meanwhile, Chinese meat and dairy producers received $45.2bn in producer SCTs during 2020. Both of these figures far exceed the $22.0bn of total investment in sub-Saharan Africa's entire Agriculture, Forests and Fisheries sector recorded by FAOSTAT in 2019.
- Several interviewees suggested that these subsidies enabled animal products produced in Europe, North America and middle-income countries including Brazil and China to be imported into sub-Saharan African markets at prices below their cost of production. They claimed that local producers were in many cases unable to match the low prices at which imported products could be offered, effectively enabling producers elsewhere in the world to undercut and outcompete sub-Saharan African farmers and pastoralists.
- Certain interviewees argued that the availability of subsidised animal products was deterring private sector investment into livestock agriculture within the region. By their account, financial institutions such as commercial banks and private equity funds are reluctant to finance meat or dairy producers who face competition from imported animal products because they are concerned that such firms will be unable to produce a profit for their investors.

One important limitation of this report is that it focuses exclusively on investment in protein production within sub-Saharan Africa itself. Delimiting the scope of the report in this way was necessary in order to ensure that the research on which it is based it would both methodologically feasible and intellectually coherent. However, it is important to acknowledge both that protein producers in other parts of the world receive far larger volumes of investment than their sub-Saharan African counterparts (as discussed in Chapter 4) and that investment outside the region shapes sub-Saharan Africa's food system in important ways.

Interviewees were often particularly eager to draw attention to the role played by public sector investment in livestock agriculture – in the form of subsidies given to producers of meat, milk and animal feed by governments in both the Global North and certain middle-income countries – in shaping the production of (and global trade in) meat and dairy products. The magnitude of these financial flows can be illustrated through analysis of the OECD's Producer Support Estimate (PSE) database. The PSE database records that in 2020 OECD Member States[5] provided their meat and dairy producers with $50.1bn in Producer Single Commodity Transfers (SCTs) – a measure of the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policies linked to the production of a single commodity. This combined figure includes the provision by OECD countries of $17.2bn in SCTs to beef and veal producers, $14.3bn to dairy producers, $9.0bn to poultry producers and $7.5bn to producers of pig meat. Meanwhile China alone provided $45.2bn in producer SCTs during 2020

5 At present the OECD has 38 Member States including Australia, Canada, Chile, France, Germany, Italy, Japan, Poland, Mexico, New Zealand, Spain, South Korea, Türkiye, the United Kingdom and the United States. Most (but not all) EU Member States are also members of the OECD.

including $16.1bn for producers of pig meat, $9.2bn for poultry producers, $7.2bn for beef and veal producers and $7.0bn for dairy producers. Public sector investment in animal products in the form of producer SCTs provided both by the OECD Member States and by China thus dwarfs the $22.0bn of total investment in sub-Saharan Africa's entire Agriculture, Forests and Fisheries sector recorded by FAOSTAT in 2019 (as illustrated in Fig. 15). Taken together, public sector investment by OECD Member States and China also accounted for the majority of the $112.1bn in SCTs which the OECD estimates was provided to meat, dairy and egg producers worldwide during 2020.

Several interviewees suggested that these producer SCTs had enabled meat and dairy products produced in Europe, North America and middle-income countries including Brazil and China to be made available on global (and sub-Saharan African) markets at prices below their real cost of production. Such products, they suggested, were imported in significant quantities into many sub-Saharan African countries, where they competed against animal products supplied by local farmers and pastoralists. They claimed that local producers were in many cases unable to match the low prices at which imported products could be offered, reiterating arguments that agricultural subsidies to farmers in the Global North (and the weakening of import controls in the Global South) have often "caused havoc for developing country farmers whose own production incentives were harmed by the availability of inexpensive imported food" (Clapp, 2012: 58). Such interviewees suggested that this public sector investment in animal protein production was thus effectively enabling producers elsewhere in the world to undercut and outcompete farmers and pastoralists in sub-Saharan Africa. This argument was made in the most general terms by one interviewee who worked for a DFI:

> **"Unfortunately livestock production in Africa is really handicapped by the fact that there is importation from Europe, United States, UK of accidental products – the milk powder, cheap poultry parts – which are really hampering the development of a commercial system in Africa. (...) Most of the products that are consumed can be produced in Africa but, you know, being on the world market at ridiculous prices, subsidised prices, they're destroying the opportunity for some people to really get into the livestock production system in a commercial way."**
>
> ***(Interview 10, Development Finance Institution)***

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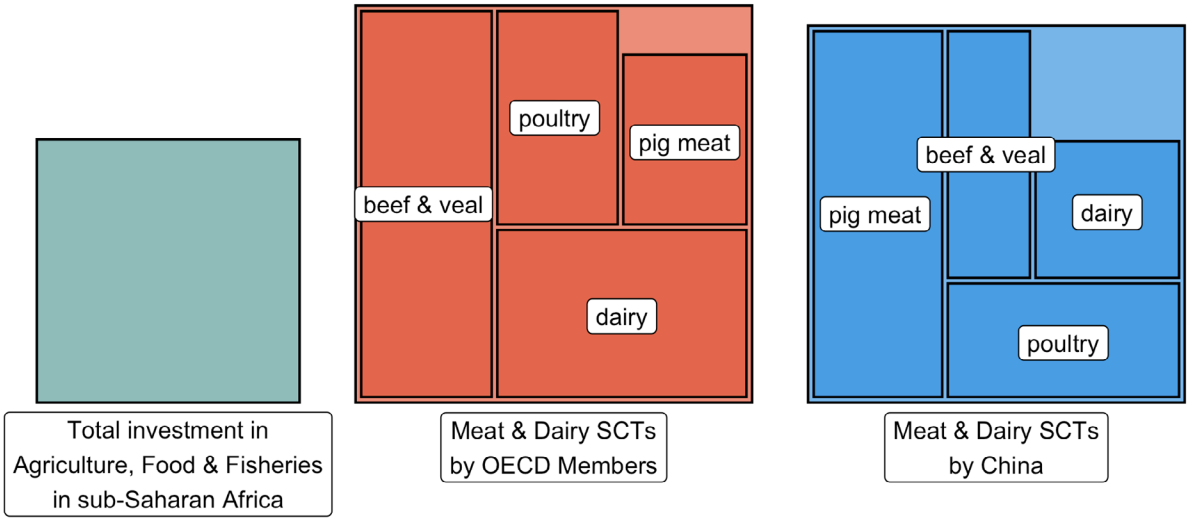

Figure 15: Total investment in sub-Saharan Africa's Agriculture in comparison to SCTs to provided to meat and dairy producers (OECD and China) during 2019. Data sources: OECD Producer Support Estimate database and FAOSTAT database.

The green box represents the $22bn of total investment in sub-Saharan Africa's Agriculture, Food and Fisheries sector recorded by the FAO during 2019. Meanwhile the red and blue boxes represent the SCTs provided to meat, dairy and egg producers by OECD countries ($50.1bn) and by China (45.2bn) during the same year. Differences in size between the boxes indicate differences in the scale of investment provided.

Certain interviewees argued that the availability of subsidised animal products was 'hampering the development' of commercial meat and dairy production systems in sub-Saharan Africa in part through deterring private sector investment into livestock agriculture within the region. By their account financial institutions such as commercial banks and private equity funds are reluctant to finance meat or dairy producers who they know will face competition in their home markets from imported animal products because they are concerned that such firms will be unable to produce a profit for their investors. In these interviewees' estimation, the existence of subsidised imported animal products thus played an important role in deterring investment which might otherwise enable sub-Saharan Africa's animal protein producers to adopt new agricultural and processing methods – and develop more formal value chains – which might bring them closer to price parity with products produced overseas. It thus actively impeded the expansion and commercialisation of certain forms of livestock production in some parts of sub-Saharan Africa. Interviews with commercial investors provided some evidence of this effect (as discussed during Chapter 5's analysis of the Protein for Profit vision). Notably, one interviewee employed by an international commercial bank illustrated this phenomenon using the example of the Ghanaian poultry market:

> **"Ghana has a relatively good business climate. But the problem with chicken is, it's very open. So West Africa is always very exposed to imports for the chicken legs, you know, the cheaper cuts from Europe and Brazil and US, and that makes it a bit tricky I would say. (...) whereas there is not a lot of imports yet coming into East Africa, so that means local industry is protected."**
>
> ***(Interview 14, commercial bank)***

Such examples illustrate the importance of situating investment in protein production within sub-Saharan Africa within broader political economies of finance which may have far-reaching impacts on the development of food systems. While exploring these wider patterns of investment is beyond the scope of the current report, it is an important area of investigation for future research.

7. Conclusions

This report has examined who invests in protein production in sub-Saharan Africa, what goals different groups of investors aim to achieve through making these investments, which protein sources and protein production systems they finance, and what theory of change leads them to think that making these investments will advance their financial and/or normative goals. This concluding chapter reviews the report's key findings, reflects on its limitations and highlights possible directions for future research.

Key Findings

Initial desk research established both that sub-Saharan Africa attracts only a small share of global investment in agriculture and food production, and that private sector financial institutions provide only a small fraction (around 5.6%) of total investment in African agriculture. National governments, agribusiness corporations and DFIs appear to be the most prominent investors in African agriculture (African Development Bank Group, 2016). While quantitative data relating specifically to investment in protein production is scarce, the interviews conducted during this research suggest that DFIs, philanthropic foundations and impact investors also finance protein production across a broader range of protein sources, countries and value chain stages than mainstream commercial financial institutions such as banks and private equity funds. Purely commercial investors appear in most cases to be deterred from financing any enterprises except those located within the most consistently profitable value chains and companies and the most stable countries in order to avoid the perceived political and economic risks of investing in sub-Saharan Africa.

This makes it all the more important to understand what motivates the comparatively small group of investors who do finance protein production in sub-Saharan Africa to do so despite these risks. This project therefore used expert interview research to identify three distinct groups of investors who were motivated by contrasting values and objectives, which led them to differing conclusions about how and by whom this perceived future demand for protein should be satisfied. These three groups of investors therefore focused their investments on different protein value chains, production systems and geographical locations, leading this project to identify three distinct 'investor visions' for the future of protein in sub-Saharan Africa.

The first such vision, Smallholder Intensification, is held by a network of DFIs, philanthropic organisations and impact investors whose investments are intended to reduce poverty, combat malnutrition and facilitate sustainable development. These investors viewed investment in livestock production as a means of increasing the household incomes, food security and economic resilience of smallholder farmers and pastoralists – and thus of achieving broader development goals from the alleviation of poverty to the promotion of gender equality. While some of these organisations had financed beef production in the past, the focus of their investments has shifted over time towards poultry, egg, dairy and (to a lesser extent) aquaculture value chains due to concerns about the environmental impacts of livestock production. These organisations typically invest in initiatives designed to increase the productivity of smallholder farmers and pastoralists and/or to connect these producers to buyers willing to pay higher prices for their produce. As such, they generally focus on suppliers of feed, medicines and DOCs to small-scale poultry and egg producers, in dairy producer cooperatives and in dairy processing operations which purchase and aggregate or process the milk produced by cooperative members. These investors seek to finance projects which will benefit the poorest and most marginalised producers in sub-Saharan Africa, and therefore often invest in locations and enterprises which purely commercial investors might consider excessively risky. Such locations include much of Eastern and Southern Africa, as well as larger West African markets such as Nigeria and Ghana. In these locations they attempt to create a distinctive protein value chain structure in which relatively large input suppliers and processors (often financed by DFIs, philanthropic investors and impact investors) supply agricultural inputs to small scale producers and/or purchase, aggregate and process their produce to supply more lucrative sales channels such as domestic retail or restaurant chains. The prominence of philanthropic and DFI funding in agricultural investment in sub-Saharan Africa suggests that

this may be the most widely held vision and be shaping the region's food systems across the widest range of locations and value chains.

A second vision, Protein for Profit, is held primarily by private equity funds and commercial banks which seek simply to produce a competitive rate of financial return on their clients' investments. These investors expect markets for animal products in sub-Saharan Africa (and thus the profitability of animal protein producers) to grow rapidly over time. However, they so far appear to be deterred from investing directly in livestock production in most sub-Saharan African countries by financial risks including political instability, volatile animal feed costs and competition from imported animal products. As a result, in most sub-Saharan African countries commercially motivated investors are willing to finance only the least risky investments. They therefore invest primarily in poultry and egg value chains because chickens have relatively short life cycles, meaning that such businesses are less exposed than other forms of animal protein production to political and economic shocks during the animal production cycle. Such investors have financed intensive, vertically integrated poultry and egg farms in a few of the region's most economically developed and stable countries (notably South Africa) and sometimes also invest in dairy processors. Elsewhere, they have begun to acquire agricultural input suppliers serving smallholder poultry farmers established by the smallholder intensification network which have a proven track record of profitability. These businesses, they believe, can be expanded to create vertically integrated poultry or egg production companies if new opportunities arise to sell these products to restaurants, retailers and institutional caterers. Investment in smallholder intensification thus appears to be playing an important role in creating opportunities for private sector capital to become involved in financing protein production in sub-Saharan Africa, and the Protein for Profit and Smallholder Intensification visions often appeared to merge to some degree. However, the influence of commercial investors within the region appears at present to be concentrated within a small number of countries and value chains.

The vast majority of investment in protein production in sub-Saharan Africa appears to be channelled towards animal protein value chains. However a third vision, Protein Diversification, was held by a distinct group of venture capital investors which financed only alternative protein producers. These venture capitalists appeared to be motivated less by expectations of future financial returns than by concerns over the environmental sustainability and ethical desirability of satisfying expected future growth in demand for protein across sub-Saharan Africa through the expansion of livestock production. Such investors sought instead to satisfy this demand through financing companies manufacturing alternative protein products such as plant-based meats and milks in the hope that if these foodstuffs could be produced at a cost similar to or lower than that of animal products then they would become a mainstream part of diets across sub-Saharan Africa. As a result their investments were concentrated heavily in South Africa, where over half of all African alternative protein producers are located. However, this small group of venture capital funds had only a limited amount of capital to invest and African alternative protein producers appeared to have little access to other sources of investment. Their expansion was therefore constrained by limited access to finance, and alternative protein production in sub-Saharan Africa currently appears to operate on only a small scale. This report found no evidence of comparable investor networks focused either on insect proteins or on the production of protein-rich crops such as beans, lentils and pulses (except where funders of smallholder intensification invested in producing and processing soy for use in animal feed). This may partly reflect the difficulty of distinguishing investment in protein crops from other agricultural investment. However, it also suggests that investment in protein production in sub-Saharan Africa is overwhelmingly focused on animal protein production with plant and other alternative proteins remaining on the margins of major funding streams.

Limitations and Future Research

This report is based on a small exploratory research project whose purpose was to identify key groups of investors in protein production, to outline the goals and visions which motivate them and to establish which forms of protein their adherents prefer to finance. In so doing it has sought to provide an informed foundation for

TABLE's ongoing programme of events and publications exploring how (and by whom) power is exercised in the food system. As a result, the scope of this report's underlying research is limited in several important ways.

First, due to a lack of publicly available data on investment in protein production in sub-Saharan Africa it was not possible to quantify the size of the financial flows mobilised by each of the investor visions identified during this project. As a result, this report simply presents the three investor visions outlined above and does not attempt to evaluate how successful the investors involved in each network have been in achieving their goals. Second, due to the limited time and resources available to the project, the three investor visions detailed in this report were derived from a small sample of expert interviewees. As a result, its analysis arguably operates at too large a geographical scale to capture any but the broadest patterns of variation in the ways in which these differing investor goals and agendas are interpreted and implemented across different countries and contexts within sub-Saharan Africa. In particular, this report's broad geographical focus has made it difficult to capture the influence of national policy initiatives on the development of protein producing enterprises and value chains in individual countries. Finally, the report's exclusive focus on investment in protein in sub-Saharan Africa means that it does not investigate whether or not the investor visions that it identifies are also salient within other regions of the Global South or explore what broader influence they might have on the development and transformation of global food systems.

As a result, this report's findings raise several important questions which can only be answered through further research. First, how successful has each of the groups of investors identified in this report been in realising their vision for the future of protein, and in what ways might they be changing sub-Saharan Africa's food system? Second, what role do individual countries' policy and institutional environments play in mediating the implementation of these visions in practice, and how does this influence the development of protein production across sub-Saharan Africa? Finally, are the three visions identified in this report unique to investors in protein production in sub-Saharan Africa or are they applied to investment in – and actively shaping the development of – protein production across the Global South more widely?

In posing these questions, this report provides a foundation for three strands of further research into the role of investors in shaping the changing place of protein in sub-Saharan Africa's food system, and perhaps the development of protein production across the Global South more broadly. First, researchers might undertake more detailed analysis of proprietary databases recording bank lending and private equity investment in agriculture in sub-Saharan Africa – and of the databases of individual DFIs and philanthropic foundations – in order to establish how large a quantity of capital is mobilised by investors aligned to each of the visions identified in the report. Such research might produce a clearer understanding of the relative influence of the three investor visions identified here and perhaps – through tracing the outcomes of key projects and companies funded by adherents to these different visions – evaluate the extent to which their objectives have been realised in practice.

Second, further research might take the form of more detailed case studies comparing the development of individual countries' animal protein sectors, or of individual protein value chains within those countries, in order to explore the role of national policy and institutional frameworks in mediating the implementation of different investor visions on the ground. In so doing, such research might provide insight into the ways in which investors' visions are translated and transformed as they are implemented in different political, economic and cultural contexts and into the ways in which these processes might be shaping the development of protein production across sub-Saharan Africa. More detailed and contextualised research of this type might also help to explain subregional and national variation in the outcomes of investment in particular forms of protein production.

Finally, future research might seek to extend this project's examination of investor visions for the future of protein production into other regions of the Global South, such as South Asia and Latin America. In so doing, such work might expand upon the research presented in this report to develop a more nuanced understanding of whose visions for the future of protein might be shaping food systems across the Global South, of whether this varies across different regions and (if so) of what power relationships might account for these differences.

Glossary

Assets: An asset is an item of property with the capacity to provide its owner with an income over time (for instance in the form of dividends, interest on a debt or property rents). Debt instruments, equities and physical items (or 'real assets') such as buildings or land are all counted as financial assets to the individuals or organisations which own them because all of them hold the potential to produce a financial return in the future.

Commercial Banks: Commercial banks raise funds primarily through accepting deposits of money from individual and business customers, which they then invest on behalf of their clients. The bank then uses the revenues generated through these investments to pay customers an agreed rate of interest on their deposits. In most markets commercial banks are highly regulated in order to protect the deposits of individual savers and small businesses and therefore focus on relatively low-risk investments such as loans to businesses or to individual mortgage borrowers.

Debt: Debt investors lend money in return for an undertaking that the original sum plus an agreed rate of interest will be repaid to the investor (or creditor) over time. Debt investments in sub-Saharan Africa are most commonly provided in the form of loans, in which an organisation makes regular payments to the creditor until the original investment (or principal) plus any interest incurred over time has been repaid. If a company ceases trading then the proceeds from the sale of its remaining assets are typically used to repay its creditors first with any remainder used to compensate equity investors. As such, debt instruments are typically considered a low-risk category of investment.

Development Finance Institutions (DFIs): DFIs are specialised public sector financial institutions – such as the World Bank Group, the African Development Bank and British International Investment – which are owned either by individual governments ('bilateral' institutions) or by intergovernmental organisations such as the UN, the EU or the African Union ('multilateral' institutions). They are established with a mandate to support economic development in the Global South (or specific regions within it) and therefore often invest proactively in organisations, locations and projects which are considered too risky or insufficiently profitable to attract commercial investment. DFIs typically finance public, private or third sector initiatives which align with their development goals using instruments such as grants, loans and loan guarantees designed to encourage private sector investors to lend to businesses in their target countries. In recent years DFIs have also become prominent investors in impact funds (see below), and some also take direct equity investments in private companies whose activities advance their development objectives.

Equities: An equity investment represents a share in the ownership of a company. Equity investors are paid a portion of the profits generated by the companies in which they have invested (a dividend), and if they own a sufficiently large share of a company then they may become involved in overseeing its management (for instance by taking a seat on its board of directors). Equity investors also have the right to sell their share of the company to another investor at a later date, which can enable them to gain a greater return on their investment than the interest on a loan or bond would typically provide if the value of the company increases rapidly. Alternatively, they may lose most of their original capital if the value of the company declines or it ceases trading. As such, equities are typically considered a high risk (but potentially high reward) category of investment.

Grants: A grant is a one-off transfer of money from a funder to an organisation whose aims or projects they support. The grant may be provided to finance the recipient organisation's operations in general over a period of time or ringfenced to ensure that the money is spent on particular activities. Recipients of grants are not usually expected to reimburse their funders, meaning that grants represent a financial loss to the grant-making organisation which it will need to replace using income from other sources. Grants are used frequently by philanthropic foundations and some DFIs.

Impact Investment Funds: Impact investment funds aim to invest in companies whose activities produce both positive environmental and/or social outcomes (for instance renewable electricity generation or the

alleviation of food insecurity) and a positive financial return for their investors. Investors in impact funds often include a mixture of philanthropic organisations, DFIs and private sector financial institutions such as pension funds, and they are sometimes considered a means of 'mobilising' private sector capital towards investments which are under-financed by purely commercial investors. Some impact funds are willing to make investments which will produce a smaller financial return than their commercial counterparts would be prepared to accept, while others require their investee companies to produce a commercially competitive financial return. While a number of approaches to impact investment exist, most impact funds with interests in sub-Saharan Africa are structured as private equity funds with additional non-financial (or 'impact') objectives because most agricultural enterprises in the region are held as private companies.

Private Equity Funds: Private equity funds raise money from other financial institutions such as sovereign wealth funds and pension funds, and/or from wealthy individuals. A professional fund manager then invests this capital by purchasing either physical assets such as land and property or equity investments in private companies. Private equity funds usually aim to return a larger profit to their investors than could be achieved through investing in other assets (such as debt or shares in companies which are traded on public stock exchanges). However, equity investments in private companies are often more difficult to sell than many other financial assets, so investors face a greater risk of losing money if the company declines in value or ceases trading.

Venture Capital (VC) Funds: VC funds are private equity funds which invest specifically in recently founded 'startup' companies with innovative products or business models which promise a high rate of growth. Such companies are considered to be likely to fail and to constitute especially risky investments, meaning that venture capitalists typically require their investee companies to expand very rapidly in order to provide them with a financial return commensurate to their risk profile.

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