



Food and Agriculture  
Organization of the  
United Nations

**AgrInvest-Food Systems Project**

# **Political economy analysis of the Kenyan food systems**

**Key political economy factors and promising value  
chains to improve food system sustainability**

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**Key political economy factors and promising value  
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## **Abstract**

The 2030 Agenda for Sustainable Development highlights the need for more sustainable food systems for tackling challenges such as malnutrition, poverty, biodiversity loss, ecosystem degradation, and climate change. However, limited access to financial resources often hampers the acceleration towards more sustainable food systems. The AgrInvest-Food System project seeks to attract private investments aligned with the Sustainable Development Goals (SDGs) into food systems by leveraging public funds. This publication supports the AgrInvest-Food Systems project by analysing Kenya's national food system through a food systems and political economy approach. These approaches resulted in mapping and linking Kenya's food system outcomes and challenges, structural factors and drivers, sustainability challenges, and institutions and actors. These analyses led to the identification of two promising value chains for SDG-aligned investment, namely indigenous vegetables and aquaculture, and of the bottlenecks that currently impede more investments in Kenya. Several potential solutions to these bottlenecks are suggested that will be further explored by the AgrInvest-Food Systems project.



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## Abbreviations and acronyms

<b>ASTGS</b>	Agriculture Sector Transformation and Growth Strategy
<b>AU</b>	African Union
<b>CAADP</b>	Comprehensive Africa Agriculture Development Programme
<b>EAC</b>	East African Community
<b>ECDPM</b>	European Centre for Development Policy Management
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>GAIN</b>	Global Alliance for Improved Nutrition
<b>GDP</b>	Gross domestic product
<b>GHG</b>	Greenhouse gas
<b>GoK</b>	Government of Kenya
<b>JKUAT</b>	Jomo Kenyatta University of Agriculture and Technology
<b>KES</b>	Kenyan Shilling
<b>MOALF</b>	Ministry of Agriculture, Livestock and Fisheries
<b>NGO</b>	Non-governmental organization
<b>SACCO</b>	Savings and Credit Cooperative
<b>SDG</b>	Sustainable Development Goal
<b>SHG</b>	Self-Help Groups
<b>SME</b>	Small and Medium-sized Enterprises
<b>UN</b>	United Nations
<b>WTO</b>	World Trade Organization

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## 1 Background, context and approach

### 1.1 The AgrInvest-Food Systems Project

The 2030 Agenda for Sustainable Development highlights the key role agri-food systems play in tackling global challenges such as malnutrition, poverty, the loss of biodiversity and ecosystem services, and climate change. Such challenges are being accentuated by the COVID-19 pandemic, which has led to disruptions in food supply chains, pushing them close to the breaking point.

Across the world, a wide range of stakeholders are supporting the transformation of food systems. However, their many independent initiatives lack a common framework for the complex interactions, interdependencies and trade-offs intrinsic to food systems. This often results in policy incoherence and poorly coordinated interventions.

In low income countries, and particularly in Africa, agri-food system actors struggle to access the financial resources needed to accelerate progress towards the Sustainable Development Goals (SDGs) and to increase resilience to global shocks. The inability of financial institutions and private investors to assess profitable opportunities within agribusiness markets is just one of the barriers that hinder investment (the others being the perceived high risk in this sector, supply side constraints, institutional weaknesses, etc.).

Against this background, Food and Agriculture Organization of the United Nations (FAO) has launched the AgrInvest-Food Systems global initiative, which aims at attracting private investments into agri-food systems aligned with the SDGs by leveraging public funds. The initiative strives to contribute to national development strategies, as well as to the upcoming Food Systems Summit, to be convened by the United Nations Secretary-General in 2021. AgrInvest-Food Systems's overarching goal is to help stakeholders understand and manage the complex choices that affect the sustainability of agri-food systems, and to accelerate progress toward the SDGs.

Under AgrInvest-Food Systems and with the aim of piloting this approach, FAO, in partnership with the European Centre for Development Policy Management (ECDPM), is implementing the project "AgrInvest-Food Systems: Enabling inclusive and efficient private sector investment in agri-food systems".<sup>1</sup> This project aims at fostering SDG-aligned investments in food systems in Africa that contribute to sustainable economic growth and generate rural employment, particularly for women and youths. Benefiting from the financial support of the Government of Italy, the project is being implemented in Burkina Faso, Ethiopia, Kenya and the Niger, and integrates the impact and local responses to the current pandemic in its analyses and activities.

## 1.2 Objectives, methodologies and approach of this study

### 1.2.1 Objectives

1. **Provide a mapping of the food system** (that can be defined as "All elements and activities that relate to production, processing, distribution, preparation, and consumption of food" (Willett *et al.*, 2019) **in Kenya and understand its broader context.** This scoping study outlines in broad terms the social, environmental, economic outcomes and drivers of Kenya's food system, as well as its key actors and political economy features, together with the associated sustainability challenges and opportunities. **Identify** broad pathways for improving the sustainability of Kenya's food system, and **promising entry points, proposing a subsequent focus for the AgrInvest-Food Systems project in terms of**

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<sup>1</sup> [Http://www.fao.org/3/ca8944en/CA8944EN.pdf](http://www.fao.org/3/ca8944en/CA8944EN.pdf)

2. **value chains and territories.** Based on the context analysis and project objectives, the scoping study identifies a small number of promising value chains and local food systems on which the rest of the project interventions could focus, presenting **the main sustainability, commercial and political traction opportunities and challenges for the value chains of focus.**

**Establish the overall basis for a food systems and political economy approach for the AgrInvest-Food Systems project,** as understanding the workings of Kenya's food system and the influence of various po-

3. litical economy factors (this Output 1) is only the first step in rolling out a politically informed food system approach for promoting sustainable investment in food value chains.

## 1.2.2 Methodologies

Food systems are intrinsically linked with a myriad of elements and dynamics, such as environmental sustainability, food security, development, livelihoods, and health, to name but a few. At the centre of these many challenges, partly captured in the SDGs, lies a crucial connection with food systems. For several challenges – such as SDGs 2 and 3 – food systems are the most important driver. The many linkages to elements and challenges provide ample need for interventions and entry points, both in terms of policy and investment.

Yet the complexity of food systems is vast, which hampers the formulation of interventions that achieve different goals simultaneously. In particular, the current food system governance is incoherent, lacks coordination, and has large power asymmetries, which make inefficiencies and waste thrive. Often, different policies and investments limit or cancel each other out. Against this background, adopting a food system approach to formulate interventions can increase coherence and maximize synergy across multiple goals. However, discussing and formulating proposals in complex systems comes with its own challenges, including power inequalities, overlapping mandates, entrenched interests, and path dependency. In this regard, political economy analysis can greatly complement a food system approach by unearthing power differentials, interests and arenas, while clarifying how the system came to be in its current state and who is responsible for it. Political economy analysis can help in understanding proposals' entry points, key stakeholders agendas and incentives, and feasibility, and could lead to more inclusive decision-making, with better proposals, implementation, and monitoring.

This study, therefore, uses the ECDPM food system approach as its main methodology (Dekeyser *et al.*, 2020), coupled with a political economy analysis, hoping to provide the right combination of tools to describe, diagnose, and help decide the food system in Kenya.

## 1.2.3 Approach and structure

This study is based on an extensive literature review and broad political economy analysis of Kenya's food system and its general context. Drawing also on previous work and the networks of both FAO and ECDPM, a number of interviews were conducted with key local stakeholders in Kenya and other experts, both during a country mission in February 2020 and virtually, to fill in gaps in context analysis, discuss pathways to improve food system sustainability, understand related ongoing local and international initiatives, and investigate entry points and bottlenecks in the relevant value chains and territories.

Section 2 provides a mapping of Kenya's food system. It summarizes its broad features, framed in terms of particular economic, social and environmental outcomes and sustainability challenges, as well as the drivers, institutions and actors that shape the food system and contribute to those outcomes and challenges. Section 3 presents the improvement pathways for Kenya's food system that emerge from our analysis, and the subsequent

suggestions in terms of value chains of focus for AgrInvest-Food Systems, describing their potential to contribute to such pathways and improve food system sustainability. Section 4 offers concluding remarks and the way forward for the Project.

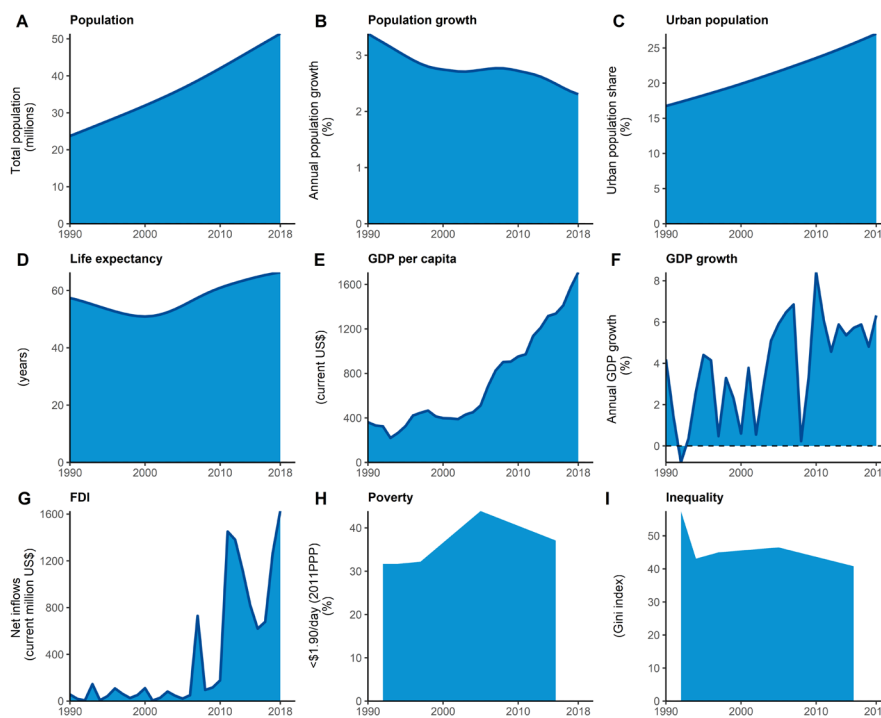
## 2 Mapping the food system in Kenya

Kenya is a lower-middle-income country with a medium Human Development Index, the only one in the East African region (UNDP, 2016). The country is experiencing rapid population growth, as the number of Kenyans more than doubled in the last 30 years to 51.4 million in 2018.

Against a background of population growth, Kenya's total urban population grew even stronger. While in 1990 almost four million Kenyans lived in cities (16.8 percent of total), this had increased to nearly 14 million by 2018 (27 percent). Overall, Kenyans live longer and, besides Rwanda, enjoy the highest life expectancy of the East African region at 65.9 years (Figure 1).

Income per capita stagnated for two decades, but overall economic growth outpaced demographic growth, making Kenya the economic powerhouse of the region (World Bank, 2016). Driven by sustained economic growth, social development and relative political stability, flows of foreign direct investments boomed more than 28 times. In 2018, Kenya placed second in East Africa for attracting foreign direct investment, behind Ethiopia (World Bank, 2020). Kenya's middle class grew, and income inequality fell. Nevertheless, many development challenges persist: the economy remains among the poorest 25 percent, and extreme poverty is high at around 40 percent (World Bank, 2016). Ten out of 17 SDGs

Figure 1 Key indicators Kenya, 1990-2018



Data by World Bank, 2020  
Visualisation by Koen Dekeyser

still face major hurdles in their achievement (Sachs *et al.*, 2019): Kenya scores particularly badly in “industry and innovation”, “no poverty”, “gender inequality”, “clean water”, “affordable energy”, and “zero hunger”. Regarding the goal of zero hunger, Kenya is on track for child wasting and obesity prevalence, but progress on child stunting is stagnating and undernourishment is rising again.

## 2.1 Food system outcomes and challenges

This subsection presents the broad features and outcomes of Kenya’s food system and identifies the key contributions it makes to social (especially food and nutrition security), environmental, and economic sustainability in Kenya. The rest of section 2 outlines the drivers, institutions and actors that shape the food system and contribute to those outcomes and sustainability challenges.

Social sustainability (including food and nutrition security)

Overall, **food security improved in Kenya in the last 20 years**, as wasting, stunting, anaemia, and the Global Hunger Index declined (Figure 2). The depth of food deficit, which measures the gap of kcal necessary to achieve full caloric security, shrank from 209 kcal per person per day in 1990 to 135 kcal in 2016 (World Bank, 2020). While this indicates progress, there is still a way to go for full caloric security. Moreover, despite undernutrition having declined strongly (indicating that dietary quality improved), most Kenyans still do not meet the recommended intake of nutritious food such as fruit and vegetables (Pengpid & Peltzer, 2018).

### Box 1 - Kenya’s food system

Kenya’s food system combines traditional and modern dynamics, with the former being dominant over the latter. As a result, Kenya has an ‘informal and expanding’ type of food system (The Food Systems Dashboard, 2020; Dekeyser, 2019). Traditional elements include widespread extreme poverty and undernourishment, even after 20 years of progress on food security. Diets are mostly cereal-based, which leads to frequent dietary inadequacy. Food production is dominated by small-scale farming and live-stock holders with underperforming yields, which feeds cycles of poverty and underinvestment. Agriculture still contributes much to the country’s GDP and takes up much of its labour. Food distribution is mostly informal, but modern trends are rapidly making inroads as well, evident in the increasing market share of supermarkets, rising overweight and obesity, the intensification of agriculture and food production through improved varieties, and the strength of agri-exports that meet stringent private and public quality standards within global value chains.

More inclusive economic growth, particularly in the last ten years, may have led to steeper declines in food insecurity. Worryingly, prevalence of **undernourishment is rising**, from 22.3 percent (2013; 10 million Kenyans) to 29.4 percent (2017; 14.7 million), erasing almost two decades of progress. Between 1990 and 2017, overweight almost doubled from 13.2 to 25.5 percent of the population (FAO *et al.*, 2019).

While Kenya has improved its hunger index score, **food insecurity is driven in Kenya** by poverty, low food safety, low dietary diversity and protein quality, insufficient food supply and infrastructure, corruption, and little access to finance for farmers (GFSI, 2019). Also, Kenya does not meet the 10 percent public investment in agriculture target as set by the Malabo Declaration, which Kenya signed. At current rates (2.4 percent in 2018), Kenya needs to increase its public investments about fourfold to reach the Malabo Declaration targets (World Bank, 2020).

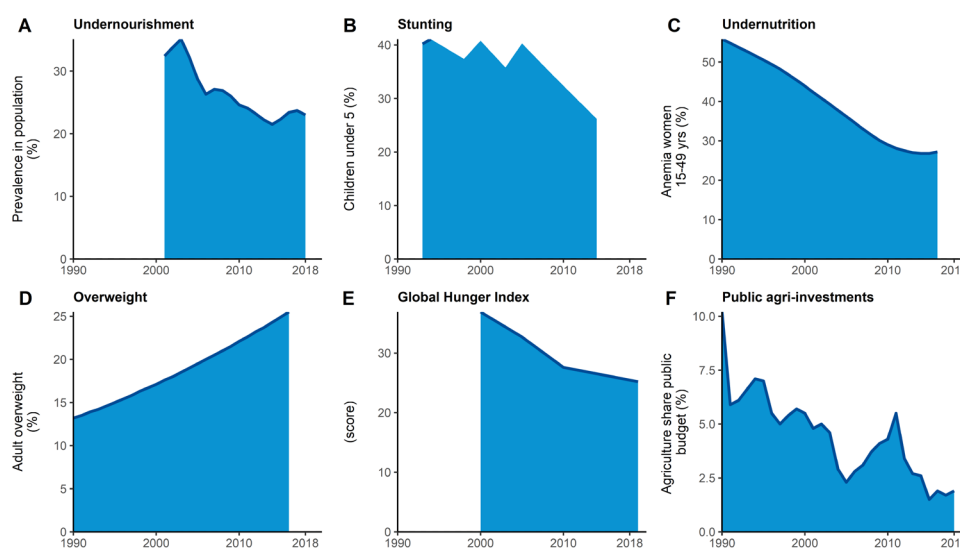
Women and men often perform different roles in Kenya’s food system. For example, traditional fruit and vegetable markets are dominated by women, but they are underrepresented in other areas – such as brokerage. In roles occupied by both genders, women frequently face gender constraints on equitable access

to resources. Lacking collateral, such as land ownership, is highly gendered, and female farmers face more obstacles in their access to finance, compared with men. This reverberates in their use of technologies and their eventual income (Wambugu *et al.*, 2018). Generally, **food system outcomes tend to be worse for women, with higher rates of malnourishment.**

### Environmental sustainability

Nomadic pastoralism dominates the semi-arid and arid areas that make up the large majority of land mass, while Kenyans overwhelmingly live in the agricultural potential areas that only constitute 18 percent of the country. **Agricultural activities**, nonetheless, **occupy slightly more than half of Kenya** (52.6 percent). Forest land decreased with 3,000 km<sup>2</sup> in the last thirty years, partly driven by population growth, charcoal production, and agricultural expansion. Over the same period, the agricultural frontier expanded by 8 000 km<sup>2</sup>, in certain areas by population growth and large-scale farming (Eckert *et al.*, 2017). As Kenya is characterized as having 'little land available, high yield gap' (Deininger, 2011), future production increases need to come mostly from yield improvements, not expansion.

Figure 2 Social sustainability: Kenyan food system, 1990-2018



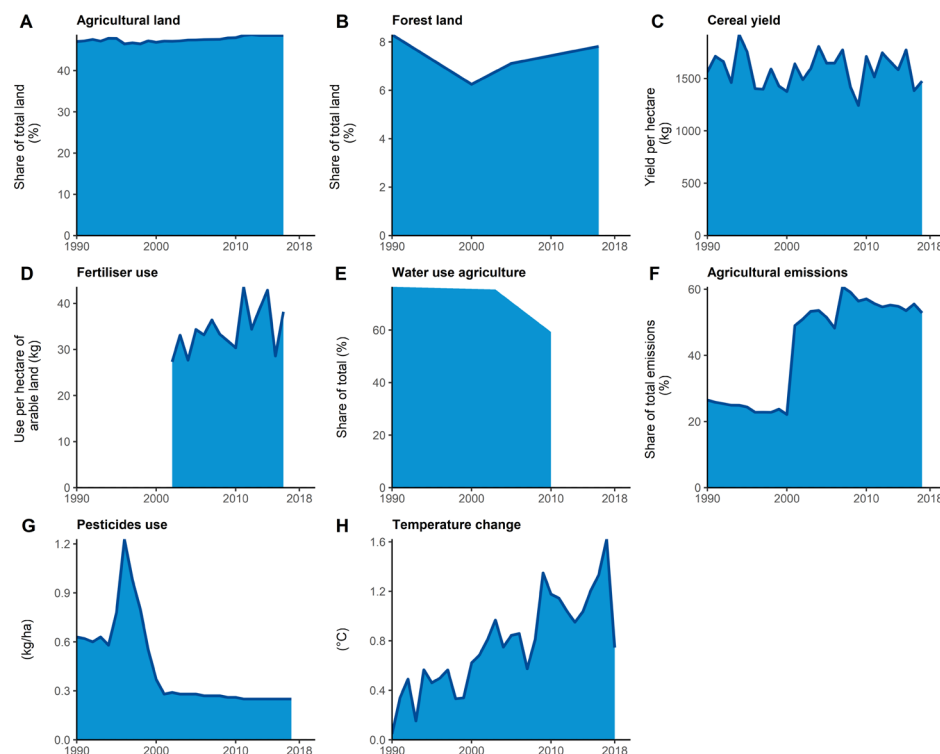
Data by World Bank, 2020, ReSAKKS, 2020, FAO 2020, and Global Hunger Index, 2020  
Visualisation by Koen Dekeyser

Population growth, deforestation, grassland and agricultural expansion with poor farming methods have led to **habitat loss and serious land degradation, putting high pressure on agricultural potential.** The yield of Kenya's cereals, including the heavily state-supported staple maize, was basically stable between 1990 and 2017, in spite of more fertiliser consumption (Figure 3). The status of agrobiodiversity is mixed: in a ten-country study, Kenya had a medium score for its present status of agrobiodiversity but made the most progress (besides India), particularly on agrobiodiverse diets, markets, and production (Bioversity International, 2019).

Evident in its high prevalence of arid lands, Kenya is marked by unequal water availability. Both the spatial distribution of agriculture and its intensification are marked by water availability. Only 18 percent receives enough rainfall to make rainfed agriculture possible. Nevertheless, agriculture utilizes the most water in Kenya, with up to **59.3 percent of total water withdrawal** (World Bank, 2020), which represents a sustainability challenge, even if most agriculture is rainfed through a bimodal seasonal pattern.

**Agriculture emits most of Kenya's CO<sub>2</sub>eq emissions** (Figure 3). Kenya, and especially its agriculture, is very vulnerable to climate change, which is expected to increase in both the occurrence and the severity of droughts and floods. In summary, Kenya's agriculture is plagued by limited water availability and recurrent droughts and floods. At the same time, the misuse of agrochemicals and land expansion leads to habitat loss and land degradation.

**Figure 3** Environmental sustainability: Kenyan food system, 1990-2018



Data by World Bank, 2020 and FAO, 2020 / Visualisation by Koen Dekeyser

### Economic sustainability

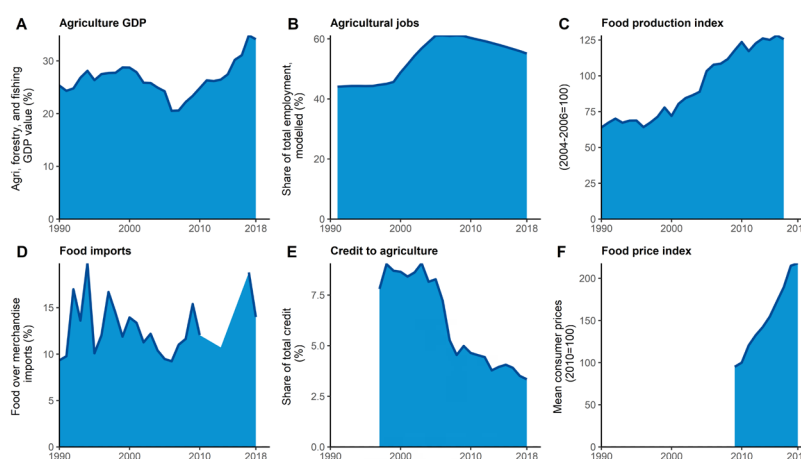
A temperate climate, coastal access, and other natural and geographic advantages have provided a strong economic base for Kenya's growth (World Bank, 2016). **Agriculture, particularly spurred by export-oriented horticulture and floriculture, directly encompasses more than a third of Kenya's Gross domestic product (GDP)**, of which livestock constitutes 15 percent of agri-GDP (ASTGS, 2019). Indirectly – through linkages with other sectors – agriculture and the food economy contribute much more to GDP. Different sectors linked to food – distributors, finance providers, processors and transport, to name but a few – probably produce most of Kenya's GDP. Kenya's agricultural exports are not very diversified as they centre around tea, coffee, horti- and floriculture (Bioversity International, 2019; World Bank, 2015). Because of the importance of the food economy to livelihood and GDP, agricultural output, and the economic sustainability of the food system more broadly speaking, are highly correlated with poverty, food insecurity, and total GDP growth.

More than 40 percent of the Kenyan population and about 70 percent of the rural population work in agriculture, which is dominated by smallholders farmers with an average of 0.2-0.3 ha that produce three-quarters of total production (D'Alessandro *et al.*, 2015; World Bank, 2015). Kenya has strong pastoralist groups that work in the arid regions, which lead the vital livestock sector (FAO, 2017), but small-scale food retail and markets also provide livelihoods to many (Dekeyser, 2019).



Significant investments currently flow into the food system, primarily to acquire assets or equity shares, by smallholders using their savings and in particular Fintech instruments such as Mpesa ('mobile money'); by small and medium-sized companies attempting to increase their profits; and by large (foreign) agribusinesses conquering new markets. Access to credit, however, is more problematic. In spite of its importance to GDP, the formal **credit flows to agriculture are tiny and declining** more and more (Figure 4), and the inequalities inherent in the food system make finance availability particularly difficult for smallholder farmers (more details are provided below in 2.3.2 under 'financial intermediaries').

**Figure 4** Economic sustainability: Kenyan food system, 1990-2018



Data by World Bank, 2020 and FAO, 2020 / Visualisation by Koen Dekeyser

This did not stop Kenya from almost doubling its production in 2016 compared with 1990. Over the last 28 years, food imports have remained relatively stable compared with merchandise imports. Nominal food prices, though, have more than doubled in ten years (World Bank, 2020). In 2020, the **COVID-19** pandemic is likely to increase food insecurity in Kenya, as global trade decreases the demand for Kenyan agri-goods and Kenya's overall economy is set to shrink, with limited public finances to ameliorate it (Africa Confidential, 2020). It is still too early, though, to assess the full damage of COVID-19, but **serious economic and social harm, especially among the poorest, is expected.**

## 2.2 Structural factors and drivers that shape the food system

### 2.2.1 Socio-economic factors and drivers

Food production is 98 percent rainfed (USAID, 2018), which creates recurrent food insecurity in the lean season. This **reliance on rain, lack of storage facilities and low levels of food processing, coupled with other market failures** and the lack of water in the dry season (particularly challenging in the Arid and semi-arid lands areas), cause food insecurity peaks in large swathes of Kenya for about eight months of the year. During the rainy season, on the other hand, there are often cases of overproduction which leads to prices falling and/or food waste.

The overall context of Kenya's food system underwent **dramatic and structural changes (including behavioural ones) in the last few decades due to the combination of population growth**, urbanization, and economic growth. These dynamics drive an increase in the overall demand for food and a dietary change towards more processed food and animal-based proteins, reshaping the Kenyan food system towards more dependence on international markets. While already present, the magnitude of these dynamics is projected to strongly increase in the coming decades: by 2050, population is projected to double, while urban dwellers, GDP per capita, and cereal demand will likely triple (Dadush & Stancil, 2010; UN ESA, 2019). As a result,

the demand for food will increase strongly. If the yield gaps are 80 percent closed – an optimistic scenario – Kenya will need to import 20 percent of its cereal needs by 2050. Under the current yield improvement rates, two-thirds of cereal demand needs to be met with imports (van Ittersum *et al.*, 2016).

Urbanization, with its associated lifestyle changes, and economic growth **change diets** towards more ultra-processed food and animal-sourced proteins, which contributes to **more overweight and Greenhouse gas (GHG) emissions** (HLPE, 2017; Lin *et al.*, 2018; Monteiro *et al.*, 2013; Willett *et al.*, 2019). While the current overweight and GHG-intensity of Kenyan diets are small, they are projected to increase in line with those of affluent countries. Without changing this pattern, affluent diets would push GHG-emissions above safe planetary boundaries under any technological or waste-reduction scenario (Springmann *et al.*, 2018).

### Box 2. Nairobi's appetite

Kenya is rapidly urbanizing (Figure 1), particularly Nairobi, which housed 4.4 million Kenyans in 2018, almost **12 percent of the total population**. The city is the political, social, and economic hub of the country and is estimated to house seven million Kenyans by 2030 (UN, 2018). Because of its size and economic power, Nairobi is by far the most important domestic food market in Kenya and attracts food from all across the region as it sources 80 percent of its food from outside its boundaries. As a result, nearby agricultural landscapes are closely linked with the Nairobi food markets (Rampa & Knaepen, 2019). Its **booming middle class** is sensitive to recent food safety scandals, such as contaminated meat and vegetables, and is willing to **pay a premium for safer food**, which it partly looks for in supermarkets (The Star, 2019; IFPRI, 2018). The demand for food from Nairobi shapes the nearby agricultural landscapes that supply the city (Binswanger-Mkhize & Savastano, 2017) and because of its strong projected growth, will do so more in the future. Besides a higher value market, the urban middle class of Kenya invests in farming as well, leveraging their financial and political power (Dekeyser, 2019). As Kenyan cities grow, so does the share of food insecure urban dwellers, which necessitates food and nutrition planning that takes into account the particularities of urban food systems.

In Kenya, wealthier consumers shop at supermarkets partly driven by a concern for food safety (Yen *et al.*, 2018). This is just one of the reasons for a **'supermarketization' of the distribution system** in Kenya, mirroring trends in other parts of the world (Neven *et al.*, 2009). As the supermarkets eventually compete with traditional markets and distribution systems, smallholder farmers lose market access as they are unable to deliver the consistent quantity and quality necessary for supermarket procurements (Gómez & Ricketts, 2013). Yet traditional value chains are still strong, even in cities: for example, traditional retail outlets sell 66 percent of Nairobi's staples (*ibid.*). E-commerce received a boost under the COVID-19 lockdown, with food and beverages – including cooked food and groceries – the fastest growing segment. Thanks to platforms such as Copia, e-commerce is moving into the rural areas too (Statista, 2020; Business Daily, 2020).

Enabled by **growing global demand and value chains, state support and trade policies**, Kenyan farmers have increased their capacity to engage with international markets, with tea, coffee, horti- and floriculture being major export commodities (Bioversity International, 2019; Tyce, 2020; World Bank, 2015). The global standards required for export are difficult to attain for the smallest producers, but those that can participate can reap the premiums, which causes a **divergence of income growth and investments between those engaged in high-value chains and those that are not** (Swinen, 2007), **and between large and small producers**. Many Kenyan farmers are firmly implanted in the global food

trade. Increasingly, the professionalized horticultural export farmers also find a middle-class market within Kenya that demands higher food quality and safety standards.

Notwithstanding a thriving agri-export sector, most food produced is consumed within Kenya. The strong demand of urban consumers – whose purchasing power has increased through economic growth – creates jobs and income in Kenya’s agricultural sector. Increasingly important for these urban markets are Small and Medium-sized Enterprises (SMEs), which create a great deal of employment in Kenya. However, agricultural production is marked by inequality: in most years, 50 percent of surplus maize is produced by 3 percent of maize farmers (Sitko *et al.*, 2017). Nevertheless, Kenyan small-scale producers are still more successful than their counterparts in other African countries, with their share of national maize production actually increasing. This success is partly the result of less elite rent-extracting, as Kenya’s agricultural sector is relatively more diversified and thus has more of a power balance between competing producer groups. Also, its recently deregulated fertiliser market is accessible to small farmers, which boosts their contribution to the national food supply (Sitko *et al.*, 2017). Urban access, however, is not equally shared as transport and licencing costs are relatively higher for smaller producers. Because of their limited surplus production and market access, **smaller producers are caught in cycles of underinvestment and underproduction**, which fuels poverty and food insecurity - especially in the lean season.

### 2.2.2 Environmental factors and drivers

Kenya has limited natural resources as, overall, “*Kenya’s agricultural resource base is best characterized by the **limited availability of productive land***” (World Bank, 2015, p. 7). Most of Kenya is arid (52.9 percent) and very arid (19.8 percent) land, with only 18 percent of Kenya’s land having medium to high agricultural potential.

Kenya has a high-temperature climate and highly variable precipitation, while being dependent on rainfed production (World Bank, 2015). Kenya’s annual temperature has become about 1.5 °C warmer since 1990 (FAO, 2020), fuelled by climate change and recently by particularly strong El Niño and La Niña periods. Climate change contributed to creating the ideal climatic conditions for the 2020 locust infestation (Carbon Brief, 2020). Drought and floods are the most common environmental risks to agricultural production in Kenya. **Drought is by far the most pressing environmental risk for farmers and pastoralists** alike. Between 1980 and 2012, Kenya experienced 13 years of widespread drought, or one year in three on average, with increased frequency and severity since 2000. These periods of droughts lead to rises in food insecurity and poverty. Rapid population growth decreases mobility and traditional coping mechanisms (World Bank, 2015). With a rising urban population, that is sensitive to rising food prices, **drought impacts urban food security as well**. Covering less land and having a slighter severity than droughts, floods occur roughly once every four years on average, mostly in western Kenya, but also in the semi-arid and arid lands.

Climate change can propel desertification further (IPCC, 2019) and is expected to decrease agricultural production and increase the volatility of outputs (Bindraban & Rabbinge, 2012). **Climate change has already intensified droughts in Kenya** (Funk *et al.*, 2016) – likely including the recent 2016-17 drought put three million more Kenyans in need of food aid (Uhe *et al.*, 2018). Further climate change is expected to negatively affect Kenya’s food production, particularly maize, as some areas, like central Kenya, could become unsuitable for maize production (Ochieng *et al.*, 2016; USAID, 2018). This would directly cause food insecurity, and indirectly less healthy diets, which can have major consequences for health (Springmann *et al.*, 2016). Given the importance of maize in Kenya’s diets (providing one-third of caloric intake; USAID, 2018), its vulnerability to climate change, and the limited investment possibilities of

small-scale farmers for adaptation, **Kenya needs to diversify its staples with more climate-resilient crops**, such as sorghum, which will likely receive a production boost under climate change (Teferi *et al.*, 2020), or cassava, with fewer yield decreases than cereals (Adhikari *et al.*, 2015). Food policy, however, is an instrument in Kenya's power settlement; and because of Kenya's diverse agro-ecology, agricultural value chains are connected with ethno-regional relationships (Sitko *et al.*, 2017). Changing support from maize to sorghum could mean shifting Kenya's ethnic power balance, which would likely lead to protest or compensation demands from the disadvantaged groups.

Lacking sustainable production techniques can lead to a general degradation of soil and other agro-ecological conditions, thus depressing harvests. To date, there are no reliable maps detailing soil quality trends but there is a consensus that **soil degradation is a problem** in Kenya (IPCC, 2019; Rampa & Knaepen, 2019). From the maps available, Kenya has areas of both persistent severe decline and strong increase in productivity (Cherlet *et al.*, 2018). Relatively more support goes to already highly-productive areas, which increases the inequality of agricultural improvement possibilities even more. Land degradation already drives "farm invasions" (Gettleman, 2017), but Kenya's devolved governance system might hamper a national response to ameliorate the resulting inequalities in agronomic conditions and income opportunities, as agricultural responsibilities are devolved to counties, which could exacerbate ethnic-regional tensions<sup>2</sup>.

## 2.3 Food system institutions and actors

### 2.3.1 Institutions

This section identifies the main policies, programmes, market arrangements or characteristics and informal institutions that are relevant to understanding the features of the Kenyan food system and its political economy dynamics.

Policies, laws and interventions relevant to the agri-food sector

In Kenya's constitution of 2010, Article 43 explicitly guarantees the "...*right to be free from hunger, and to have adequate food of acceptable quality*", providing a food and nutrition security mandate to the government (Republic of Kenya, 2019). Agricultural governance in Kenya is broad and complex, with a multitude of public, parastatal, non-governmental and private sectors (D'Alessandro *et al.*, 2015). The state's role has changed over time, but "*Agricultural policies in recent years are best characterized by **strong Government of Kenya (GoK) presence and control of produce and input prices for producers and a sustained focus on stimulating productivity***" (D'Alessandro *et al.*, 2015, p. 23).

Institutionally, **Kenya implemented a devolved governance system in 2010**. The national government remains responsible for overall coordination and policy formulation but **increased responsibilities are delegated to the 47 county governments**, including key agriculture responsibilities. In 2018, the central government invested a low 2.8 percent of its total budget in agriculture (ReSAKKS, 2020), but counties can independently allocate their budget to agriculture besides the normal budget transfers from central government (Owino, 2019). Again in 2018, counties spent on average 6.3 percent of their total budget on agriculture and food and nutrition security, much more than the central government. While counties receive around 20 percent of the central government's revenue (Africa Check, 2019), they raise their own revenues as well. Some of these revenues comes from property, entertainment or other taxes, such as business permits. Food transport between counties is often taxed at each county border, raising the costs of food distribution (Kenya Market Trust 2016, <https://bit.ly/2B1oCdH> ; KEPSA 2015, <https://bit.ly/2OaNyN6>).

<sup>2</sup> It is to be noted, however, that the new Constitution created an Equalization Fund to be used by marginalized counties in critical investments that would spur economic growth and hopefully decrease inequality across the country.

At first, the devolution was implemented abruptly, thus leaving little time for adequate preparation, lacking effective intergovernmental coordination mechanisms, and with **conflicting mandates between national and county governments**. Budget cuts in extension services following the devolution created further problems for farmers (Rampa & Knaepen, 2019).

However, devolution does not mean the lack of a national food policy. A signatory of the African Union's (AU) **Comprehensive African Agricultural Development Programme (CAADP)**, Kenya transposed the CAADP into the Agricultural Sector Development Strategy (2010-20). This overall strategy streamlines the agricultural ministries and other stakeholders, while identifying priority value chains for orienting investment (Rampa & Knaepen, 2019). Yet it did not alleviate the poor sector coordination that hampered agri-investments, which prompted the development of the **Agriculture Sector Transformation and Growth Strategy (ASTGS; 2019-29)** based on a multi-stakeholder consultation process. The ASTGS bases itself on constitutional Article 43, Kenya's Big Four agenda, CAADP and the Malabo Declaration, the AU's Agenda 2063, and the UN SDGs (Republic of Kenya, 2019). The strategy is linked with Kenya's Big Four agenda for 2018-22, in which Food Security and Nutrition/Agriculture feature prominently. The strategy aims for **both large-scale commercial farming and increasing smallholder productivity**. For instance, the state remains active in the national cereal sector, particularly maize, which receives input subsidies, is purchased above market rates, and is regularly protected through tariffs on imported maize (Rampa & Knaepen, 2019; Sitko *et al.*, 2017).

The ASTGS seeks to modernize agriculture by 2029, centred around increasing farmers' income, output and value adding, and household food security, particularly in the Arid and semi-arid lands regions. The current **government's change in narrative** (relating to the above mentioned '*strong GoK presence*') **envisages a stronger role for the private sector**: about €4 billion of investments are envisioned, with up to 80 percent coming from public-private partnerships, and the remaining 20 percent from GoK and its development partners (Republic of Kenya, 2019). A particularly important related area of modernization is the reform of the government's fertiliser subsidy scheme, as input subsidies alone consumed up to 20 percent of the agricultural public budget between 2009-14 (Sitko *et al.*, 2017), but which is in the process of being replaced by a private-led system distributing e-vouchers.

Currently, despite the change in the overall narrative, the Kenyan government is particularly involved in the maize value chain, one of Kenya's ~100 value chains. However, some of the other **value chains have better social, economic, and environmental advantages than maize** (Rampa & Knaepen, 2019), for example, value chains differ in their income and dietary diversity potential, combined with their agro-ecological competitiveness. The ASTGS identifies maize as one of the value chains with the highest potential for agricultural transformation (Republic of Kenya, 2019).

Within these broader frameworks, **more detailed thematic policies operate**, including environmental and nutrition ones. The National Land Policy and the Climate Smart Agriculture Strategy (2017-26) provide guidance for transitioning Kenya's agriculture towards environmental sustainability. Kenya is well endowed with nutrition policies through the multi-sectoral Food and Nutrition Security Policy (2011), the National Food and Nutrition Security Policy Implementation Framework (2017-22), and a National Nutrition Action Plan (2012-17). The mandatory fortification of cereal flours and vegetable oils are an example of these nutrition policies. Kenya's food safety is administered through its National Food Safety Policy, while the National Seed Policy guides the seed industry. The Crop Act of 2013 targets growth and development for agricultural crops, while the Price Control Act gives the government the authority to determine the price of essential commodities such as maize (Rampa & Knaepen, 2019).

**An ecosystem of private and philanthropic business services and initiatives** sprouted with the objective of supporting the transition to more sustainable food systems. The Kenya Climate Innovation Center, for example, provides incubation, capacity building services and financing to Kenyan entrepreneurs and new ventures that are developing innovative solutions for energy, water and agribusinesses to address climate change challenges. The Global Alliance for Improved Nutrition (GAIN), another example, has its “Marketplace for Nutritious Foods” programme that focuses on supporting SMEs in the nutritious food value chain to develop profitable business models and bring nutritious and safe foods to market sustainably.

#### **Local, national and international market arrangements and characteristics**

The Kenyan government focuses on supporting, in addition to livestock and dairy, a **“Big Five” of agricultural crops** and their marketing arrangements: maize, rice, potatoes, tea, and coffee, based on their food security or commercial contributions. Specifically, the **government is actively involved in the maize sector**, thus referred to by many as a “political crop”. The government buys maize directly during the harvest season to keep stocks for periods of food shortages or to influence prices, particularly for electoral reasons (Kirimi *et al.*, 2011). One of the main reasons for maize’s popularity are the decades-long input subsidies, such as granting or providing below-market rate fertilisers. In times of shortage, the government subsidizes maize imports in order to lower consumer prices (Rampa & Knaepen, 2019).

Kenya has **two distinct national distribution systems** for agri-food products: one based on small-scale production and informal networks, and one based on contract-farming and supermarkets. Most farmers are small-scale, with mostly rainfed produce, and have limited storage and processing facilities, hence cash-strapped farmers sell their surplus around the peak of seasonal production at the lowest prices. These farmers rely on the markets for their diets in the lean season, when food prices are high, which feeds a cycle of food insecurity and economic deprivation. In the harvest season, these farmers sell their surplus to a cascading network of middlemen and informal traders. These are at the centre of a complex series of exchanges and economic intermediaries that link producers to rural wholesalers, urban wholesalers, local traders, supermarkets, shop owners and street sellers. In such fragmented markets, a single piece of food can travel many hundred miles before reaching the final consumer (Rampa & Knaepen, 2019). These middlemen are often ignored by policymakers. However, better understanding the political economy of the informal distribution system and improving its governance can ameliorate the efficiency of value chains, and should thus be part of the efforts to improve sustainability of the food system (as further discussed below).

While most of the food in urban and rural Kenya is still likely to be traded informally, it experienced a **surge in the number and market share of supermarkets**, mimicking the supply chain transformations in other parts of the world (Gómez & Ricketts, 2013; Reardon *et al.*, 2015). Differently from other countries, though, the rise of medium-scale farmers – and the subsequent decline of small-scale farmers – is less steep than in other countries. Nevertheless, medium-scale farmers occupy more land than large ones in Kenya, and are those that supply to the growing supermarkets (Jayne *et al.*, 2016; Neven *et al.*, 2009). **Processing, like distribution, can be highly concentrated** as well. Milk processing in the formal value chain, for example, is dominated by just three companies. Here, linkages between the elite and state are evident too, as one of the three largest milk processing companies – the largest one in East Africa – is owned by the current President’s family.

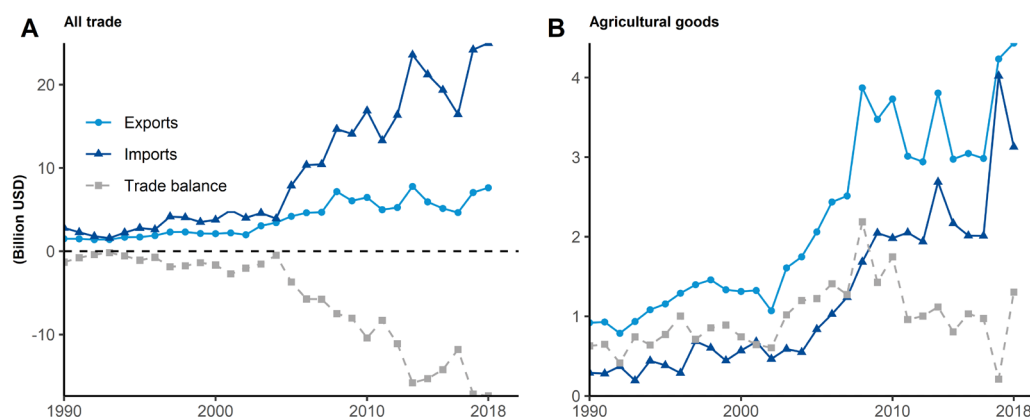
**International market arrangements are also important**; and in certain sectors they are more important than the national ones, thus strongly influencing the food system in Kenya (as detailed below

when discussing the 'external drivers'). Kenya has had a sustained negative trade balance overall for the last 28 years, but its agricultural trade balance is positive (Figure 5), which shows the strategic importance of agriculture for Kenya's exports.

Kenya is one of the largest tea exporters globally<sup>3</sup>. Nevertheless, coffee, horti- and floriculture exports are **major export successes** as well, **facilitated by a relationship between elites and state** (Tyce, 2020). This has resulted in foreign investors teaming up with local elites, and an overall incentive environment that favours large and medium-sized over small producers, contributing to a cycle of underinvestment and underproduction for the latter. In Nakuru County, for example, the floriculture and horticulture export sector is owned by international commercial agribusinesses, and the produce is mainly sold to European, and increasingly to Asian, markets. Besides government support for foreign investment, several factors led to the establishment and growth of floriculture, including irrigation, the availability of large farms for commercial production, the soils and climate conducive to horticultural production, and the relative proximity to Jomo Kenyatta International Airport (Rampa & Knaepen, 2019). While on aggregate Kenya trades more with East Africa than with Europe, the latter is the prime export destination for Kenya's agricultural goods, particularly the Netherlands, the United Kingdom and Germany. As a beneficiary of the Cotonou Agreement, Kenyan goods receive **preferential access to European Union markets** which was one of the key drivers behind horti- and floricultures' success, as well as one of the reasons behind the public support to these sectors.

**Regional agreements** are in effect as well: Kenya adheres to three Regional Economic Communities in Eastern Africa (the East African Community (EAC), the Intergovernmental Authority on Development,

Figure 5 Kenya: all trade and agricultural trade, 1990-2018



Data by Open Trade Statistics / Visualisation by Koen Dekeyser

and the Common Market for Eastern and Southern Africa) that are establishing common policy and regulatory frameworks providing for the integration of regional markets. However, East African trade in food is subject to several non-tariff barriers including ad hoc import and exports bans, which at times depress trade with neighbouring countries. Because of these barriers, certain goods are easier

<sup>3</sup> Kenyan tea production is mostly small-scale as the GoK included small-scale producers in the tea value chain following independence. The inclusion and market share of small producers contrasts with Kenya's horti- and floriculture, which are more dominated by large-scale producers.

to export to Europe than to neighbouring countries. Kenya is also a member of the future African Continental Free Trade Area, the implementation of which has been delayed by COVID-19.

The relationship between export-oriented agri-elites, small farmers, and the state seems to have been shifting recently more in favour of smaller farmers and counties. Conflict between these export-oriented agri-elites and small farmers has so far been relatively low. While land conflict is not absent, **strong land laws have led to less friction than in other countries between local communities and foreign investors** (Dekeyser, 2019). On the other hand, a supposedly less favourable investment climate – attributed to the strong land laws and the interference of local politics – has caused some divestments from the horticulture sector in favour of Ethiopia (Tyce, 2020), a dynamic also present in the floriculture sector.

### 2.3.2 Informal institutions

Politics in Kenya is heavily influenced by **ethnicity**, which is a central element, albeit informally, in Kenya's political balance of power (Ajulu, 2002; Shilaho, 2018). The colonial and post-colonial land distribution was partly based on ethnicity and favoured some tribes more than others. As a result, land access and agriculture are highly politicized, with competitive tribalism influencing food policy and the choice of the agricultural value chains that the state elites support. The legacy of land distribution comes more to the fore in periods of drought, when pastoralist groups seek resources for their herds. Patriarchy and other informal rules limit women's ownership of land, which spills over in financial access as land is often taken as collateral. Because of the many gender-constrained informal rules, female access to finance is low (WEF, 2019).

While reliable data is lacking, the informal economy may provide more than eight out of ten jobs and contributes about a third of GDP in Kenya (Githinji, 2018). Kenya's food system has similar dynamics with most production and distribution at least partly informal. Depending on the value chain, the **formal and informal operators may serve totally different markets, cooperate in various ways, or compete**. For instance, in the dairy sector, one of the most important in Kenya, the informal and formal value chains compete for both urban consumers and inadequate raw milk supplies, especially during dry seasons. This sector has been characterized by tensions between formal and informal operators for some time, with the government under pressure to ban informal sales of raw milk in urban areas that compete with the formal supply of (at least partly) processed milk (Bingi & Tondel, 2015). These tensions have often been attributed to the lobbying efforts of large industrial processors that would like to exclude the informal players with tighter and enforced regulations. The seed sector has similar dynamics, with a thriving informal sector competing with a formal one that is pushing for stricter quality control. The formal sector has better prospects for accessing formal finance for business and research development, but many informal channels of credit providers exist for the informal sector as well.

**In the food distribution system, the formation of cartels** has been reported. "Market cartels" police the entrance to the large Nairobi food markets and levy an informal (illegal) fee on those selling there, depending on the mode of transport, weight and quantity of the produce. The cartels are enabled by corrupt government officials (The Standard, 2015). The resulting cash flow might eventually be used to gain political clout. The strong position of cartels is evident in other parts of Kenya's food system. Cartels of middlemen, for example, have been reported as cheating potato farmers by forcing them to use bags larger than those prescribed by formal regulations (requiring potatoes to be packed in larger bags and paying farmers almost the same price as for the prescribed 50kg bags; Muchui, 2019).



In other cases, **informal institutions are very important for food security and income generation**. Kenya, for instance, is dotted with informal side-road food markets. While this form of selling provides many livelihoods and helps food access for the poor, it is frequently ignored or repressed by policymakers despite its crucial role, especially in the urban food economy. Even in cases when formalization would be beneficial, such as in combating cartels or improving food safety, the related incentives should be better considered, as growing from informal to formal comes with a host of costs, such as more licences, taxes and standardisation (Rampa & Knaepen, 2019).

### 2.3.3 Actors, agency and incentives

This section identifies the main multi-level actors and stakeholders, and their incentives, which are important for understanding the key political economy dynamics of Kenya's food system, including public and private sector actors, investors, civil society organizations, development banks, donors, etc.

#### **Key local public sector actors**

Counties are more ethnically homogeneous, and thus ethnicity plays less of a role in their balance of power. In Kenya's devolved government system, **county governments** are increasingly seen as the main actors of agricultural policy. Decisions that strongly influence local food systems – such as regulations for trading, markets or zoning – are decided at the county level. The counties steer their Agricultural Division, which oversees the extension officers and is responsible for the development of the agricultural sector in the area. Besides the county governments, national public agencies, such as the Kenya Plant Health Inspectorate Service, are active on the ground as well (Rampa & Knaepen, 2019).

However, other actors – the national ministry, private associations, and market agents – jostle for power in a crowded actor landscape. The agricultural sector has a long-standing tripartite relationship between state, agribusiness, and smallholders (Oya, 2012). **Politically-linked Kenyan families have inserted themselves into the agricultural sector since the nation's independence**, with preferential access to land and state support (Anseeuw & Alden, 2010; Tyce, 2020). In general, the **state – local or national – is still important for a sector's success**. Even in the case of Kenya's horticulture, for instance, usually presented as “a private-sector success story” with limited role for the public sector, the Kenyan state played a very significant part. It not only removed bottlenecks around market access, infrastructure and inputs, but also played a sort of “producer role” through state and political elites that (co-) owned horticultural businesses enjoying a level of support similar to state-owned enterprises (Tyce, 2020).

Finally, **public research institutions** conduct research on, and often influence the strategic directions of, various parts of the food system, including Jomo Kenyatta University of Agriculture and Technology (JKUAT), Egerton University, and Baraka Agricultural College (Rampa & Knaepen, 2019). Since the 1980s, Jomo Kenyatta University of Agriculture and Technology is famous for educating the future agricultural professional elite, and through them keeps its linkages with Kenya's agricultural public and private decision makers. Through these linkages, the university, for instance, has attracted numerous grants from the public and private sector to conduct research in support of large and export-oriented agriculture<sup>4</sup>.

### Key local private sector actors

Kenya's food economy is quite unique not only due to the engagement of small-scale farmers in global supply chains, but also due to the level of professionalism and social organization in the local and national supply chains. The key local private actors in Kenya's food system are arguably the small-, medium-, and large-scale farmers and the many people engaged in the (in)formal distribution system. Most agricultural producers in Kenya are small-scale, with the average farm size declining from 4.1 ha in 1970 to 2.1 ha in 2010. The **primary agenda of such farming is subsistence, reproduction, and limited commercialization**. Because of rainfed agriculture and limited storage capacity, these farmers have a weak position of power in the market, and encounter the most unfavourable prices during harvest season. These farmers are weakly organized among themselves (except for cooperatives of certain value chains) and in relation to traders due to the farmers' high level of fragmentation (Rampa & Knaepen, 2019).

While most farms (74 percent of the total in 2006) are smaller than one ha, medium and large farms have grown (Jayne *et al.*, 2014). Therefore, Kenya's agricultural landscape is characterized by small-, medium-, and large-scale farming, depending on the region. The **medium and large farmers' main agenda** goes beyond livelihood provision as it focuses on **expanding profits and reducing risks**. Their size provides more market power, which translates into better negotiated market prices compared with small producers. Sometimes, alliances are formed between traders and large farms, or the large farms set-up their own concentrated distribution linkages (Rampa & Knaepen, 2019). More recently, SMEs in Kenya have increasingly been involved in business ventures that promote healthy diets, with significant potential for making nutritious food a good business opportunity in the near future (GAIN, n.d.).

Currently, the government is having difficulty in marrying the interests of the large and small-scale producers. The **political elite connect to, or are, medium or large farmers themselves** (Jayne *et al.*, 2014), creating a system of incentives to their advantage, as is evident in the recurrent introduction of input subsidies favouring larger farmers. As a result, many small-scale farms deteriorate, with high population growth, no land-use policy, or zoning laws. Decreasing plot sizes, due to population growth or farm concentration, impact the environmental sustainability of farming. As farmers depend on smaller areas to secure livelihoods and food security, they push productivity by reducing fallows and using more fertiliser to boost soil fertility. Furthermore, smaller plots may increase the livelihood impacts of drought and floods.

Food distribution in Kenya can be informal or formal, domestic or export-oriented. Each distribution chain has different requirements regarding infrastructure (e.g. roads, markets, airports or ports) and level of organization. In Kenya, **most food distribution is informal** and for the domestic market. In regions with high land prices, informal markets may provide the "livelihood-of-last-resort" rather than farming, as the entry barriers are smaller. The agenda of these informal sellers is, just as for the small-scale farmers, primarily livelihood provision (Dekeyser, 2019). The middlemen supplying these markets generally have a better negotiating position than the fragmented farmers (Rampa & Knaepen, 2019). Despite their overall 'bad reputation' relating to cases of cartels (as explained above), middlemen have an unexploited potential to better connect fragmented smallholders to consumers, in more transparent and efficient ways. Better regulation and support of their business would create **better incentives for these traders to significantly contribute to more efficient and sustainable value chains**, for the benefit of the whole food system. Finally, the concentrated distribution system

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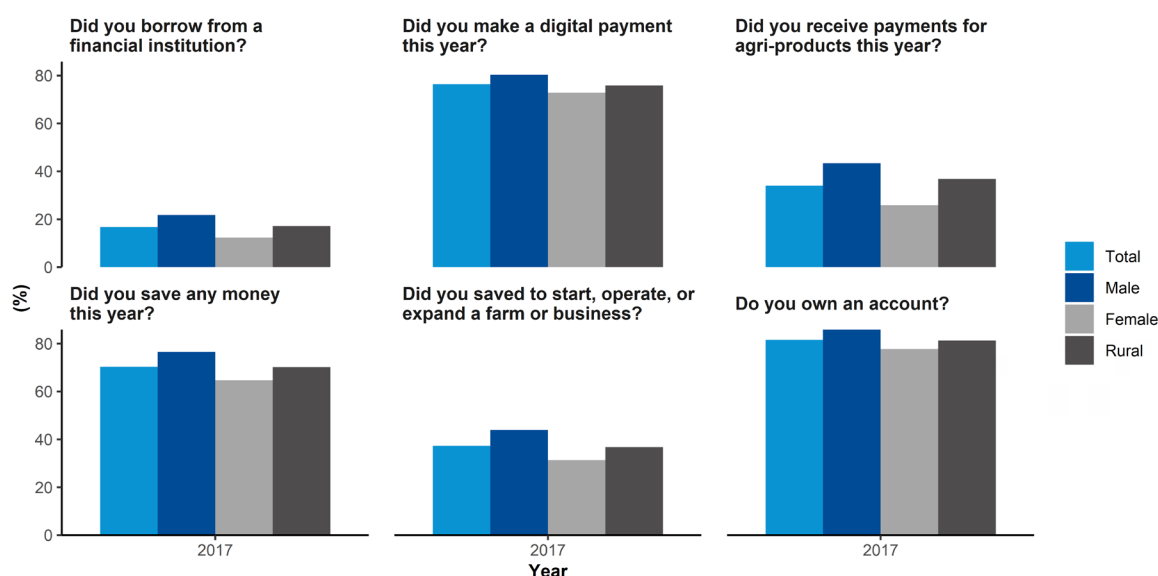
<sup>4</sup> FAO and Jomo Kenyatta University of Agriculture and Technology work with small and medium-sized enterprises towards the adoption of sustainable nutrition-sensitive business models.

of supermarkets provides a market-setting power, not only influencing price premiums but also in demanding food safety and quality control. They have their own system of registered traders (Rampa & Knaepen, 2019).

The processing of staples in Kenya – maize particularly – is often done through a network of local posho mills, which are supplied by small producers on an ad hoc basis. Because of the many small posho millers, the political influence of large millers is relatively smaller than in other countries, and are less able to advocate for milling subsidies (Sitko *et al.*, 2017). Increasingly, many food sub-sectors are moving up the value chain, sometimes up to an ultra-processed level, with larger processing companies being supplied by medium-sized and large farms. The **strong agency of entrepreneurs and investors engaged in processing** shows the large potential of the Kenyan food economy whenever the opportunity presents itself, especially through increasing demand. This, for example, was the case of the dairy sector (Kenya is estimated to have some of the highest milk consumption in Africa): recent reforms led the transition from heavily state-managed industry to private-sector-driven industry, especially in processing. In the same way, large amounts of private investment flowed to processing in intensive cattle and feed systems.

### **Financial intermediaries**

Overall, Kenyans are relatively well connected to the financial sector. More than 80 percent of those aged 15 and over have a financial account, and up to 76 percent made a digital payment in 2017. Savings are high as well, with 70 percent saving some money in 2017. Agricultural finance – saving for a farm or receiving money for farm products – is at a lower rate than the sector's livelihoods, which might indicate that many farmers do not sell to the market or save for their agri-business. In each of the selected financial indicators, males have higher rates of engagement than females or those living in rural areas (Figure 6). However, the differences are lower than for other dynamics of the food system, such as land access, which might indicate that women face relatively fewer obstacles in access the financial sector. This seems related to the accessibility of digital services: a World Bank study found that access to mobile money services delivered big benefits, especially for women (World Bank, 2017). Kenya has a relatively well-developed financial market, ranging from well-established formal banks, community SACCOs, to mobile phone-based money transfer services, such as M-Pesa. As such, there is a wide range of different channels for accessing credit. However, availability does not mean access as, in general, the lack of credit, especially for small players, remains an important feature of Kenya's food system and is one of the largest obstacles to the growth of the food economy<sup>5</sup>. To increase the volume of loans to agriculture, the Kenyan government instituted an interest cap of 4 percent above the Central Banks' base rate in 2016. This cap instead depressed lending to the agriculture sector, since no bank felt that the 13 percent interest rate reflected the high risks and lack of collateral (African Business, 2020), especially associated with smallholders and agricultural SMEs (given their higher reliance on variable rains and particularly low investment returns). Subsequently, private investments in agriculture dropped further (Figure 6), while according to interviews under the AgrInvest-Food Systems project the informal market for hugely expensive loans thrived even more. In 2019, this cap was abandoned. **Financial intermediaries**, on the one hand, **still struggle to invest in Kenyan agriculture**, as only 3.4 percent of the total investments of formal intermediaries went to agriculture in 2018, far below its share of GDP. Farmers, on the other hand, worry about a return to the prohibitive interest rates of 24-32 percent (African Business, 2020).

**Figure 6** Selected Kenyan financial indicators, 2017


Data by The Global Findex, World Bank (2017) / Visualisation by Koen Dekeyser

Plenty of banks – such as I&M Bank, Equity, Sidian, and the Co-operative Bank noted the low investment levels in agriculture compared with its share of GDP and **announced their intention to increase their investments in the sector**. Equity Bank, for example, ambitiously aims to increase the share of agricultural investments from its current 4 percent to 30 percent by 2030, with help from the Rabobank Foundation. I&M Bank aims to double its current 3.5 percent exposure, while Sidian Bank declares that agriculture is a key priority<sup>5</sup>. More investments in agriculture could be made, in principle, by improving the incentive system and easing the conditions for collateral – by also accepting, for example, land leases, offtake agreements or vehicles as collateral (thus also redistributing risks among different stakeholders) – or adapting repayment schemes to farming cycles. Currently, banks might be too risk averse, with limited products targeting farmers, demanding a 1:1 collateral and with a stifling bureaucracy for loan applications.

However, there is **scepticism as to whether these banks can reach their ambitious targets** as there is uncertainty regarding a) the number of farmers that are bankable, given the potential high risk and low return on investment for small-scale farmers; b) the risk management of agricultural investments, particularly relating to adverse weather striking many farmers simultaneously; c) the ability to scale up agricultural loan applications efficiently; d) the overall risk exposure of several banks themselves; and e) the need for financial ecosystem services that help farmers to become more investment ready.

Private and public investment, however low, does reach agricultural SMEs and smallholders. For example, the **Agricultural Finance Corporation** is a government development finance institution mandated to provide credit for developing agriculture. The corporation was credited with being one of the only institutions providing affordable loans to smallholders, and looks at blended finance – which uses public or philanthropic funds to entice private investments – to increase agricultural investments

<sup>5</sup> Personal interviews, Kenyan stakeholders, 24 February-07 March 2020.

<sup>6</sup> Personal interviews, Kenyan banks, 24 February-07 March 2020.

(AFC, 2019). Other, more **innovative finance solutions for agriculture** crop up as well: MobiGrow, for example, provides chickens, feed, and a market in one package. A trader collects the chickens once grown, and the farmer receives the fees minus the inputs.

A recurrent issue in financing SMEs relates to their bankability, meaning the acceptance of said SMEs for bank loans, given their current business plans. To ameliorate this, **several business support companies**, such as IntelliCap, provide “business ecosystem services” that help SMEs to bring a viable business plan to financiers. However, paperwork, non-progressive taxes, import duties on agri-tech, and different business requirements concerning SMEs per county due to devolution stifle the creation of successful business plans.

More specific finance providers are **microfinance institutions**, such as the ASA Limited Group, the Kenya Women Microfinance Bank, the Grameen Bank, Musoni and many others (Rampa & Knaepen, 2019). **International development organizations** or institutions already provide grants or loans to food system actors. There are several large blended finance instruments operating in Kenya. The European Union’s Agrifi fund works on sustainable agriculture and has already invested almost €13 million in Kenya. Similarly, the IDH Farmfit Fund provides €100 million worldwide to increase the income of food system actors that work sustainably. New investors are arriving as well, with GAIN launching its Nutritious Food Financing Facility (N3F) in 2020 to support investment opportunities in nutritious food value chains (GAIN, 2020a).

In 2019, Kenya received, all economic sectors combined, the **second most blended transactions worldwide**, signalling its importance as a destination for blended finance (Convergence Finance, 2019). Many finance actors in Kenya are looking to collaborate, or are already working, through blended finance instruments, including those relating to the SDGs. Several new fora to coordinate blending finance instruments have been set up in Kenya, particularly the SDG Partnership Platform that launched a specific “SDG 2 financing window” in February 2020. While there is a substantial appetite for leveraging blended finance to achieve SDG 2, however, **even philanthropic funds engaged in blended finance in Kenya seem to be facing difficulties**, both with the incentives and risks involved in smallholder financing as well as with aligning the working modalities of public and private financial instruments (given their often very different procedures and objectives).

### **Cooperatives**

Kenya has a long history of cooperatives and had 22,000 cooperative societies with almost 11 million members in 2018. For the agricultural sector, which had more than 14,000 cooperatives in 2011, cooperatives can be broadly categorized into agricultural-specific cooperatives that provide (in most cases for a specific value chain, and historically mostly cash-crops) services such as collective input-buying or marketing; and finance-related cooperatives, such as the “savings and credit cooperatives” (SACCOs). The SACCOs provide saving and loan opportunities to smaller farmers with a much greater flexibility in paperwork and collateral than banks, as groups of households apply for loans, rather than individual farmers. As such, **social cohesion and peer oversight can de-risk investments** by acting as incentives for compliance for all those involved (Rampa & Knaepen, 2019). Their payment cycle can be farmer-friendly, such as only repaying input loans when the harvest is sold.

The most popular form of community organization in Kenya – both urban and rural – is through **self-help groups** (SHG), which are voluntary, often informal, community associations where common daily issues are solved through mutual support and peer oversight. In the agriculture sector, SHGs are estimated to be much more numerous than the more formal cooperatives. In particular, these SHG groups are important for improving the agricultural knowledge of small farmers and gaining access

to market niches, while other SHGs facilitate community-level rotating savings and credit schemes for small farmers (Rampa & Knaepen, 2019).

Interestingly, the latest national cabinet reshuffle in Kenya included moving the responsibility for cooperatives development from the Ministry of Industry and Trade to the Ministry of Agriculture, Livestock and Fisheries (MOALF). This is an attempt to make the cooperative movement better serve the needs of the agricultural sector, and smallholders in particular.

### 2.3.4 Foreign investors and other international actors

Certainly, **inward foreign direct investment to Kenya exploded since 2010** (Figure 1). The United Kingdom, the Netherlands, Belgium, China and South Africa are the main investors in Kenya (Santandertrade, 2019). While Kenyans are also investing in land and food distribution in neighbouring countries, Kenya receives major foreign investments in agriculture, such as for large **export-oriented horticulture and floriculture** (Kaag & Zoomers, 2014), mainly from the Netherlands, the UK, or India. It remains to be seen to what extent the current incentive system, provided by the general enabling environment and the credit markets in particular, could be improved to facilitate a rebalancing of such investments towards the local food system, as initiatives such as the ASTGS or the SDG Partnership Platform would seem to favour.

In addition to a wide range of local non-governmental organizations (NGO), Kenya also hosts a large number of **international NGOs** that work in the food system area, including, for example: a) Farm Concern International, which focuses on value chain development, capacity enhancement, and provides technical support to farmer organizations; b) GAIN, which works on nutrition and nutrition sensitive environments; c) Hivos, which builds civil society capacity and advocates for more sustainable food systems; and d) Slow Food, which defends agrobiodiversity, sustainable farm practices and consumption of locally produced food. Finally, other international actors that often hold considerable power and influence are technical and financial actors active in the food sector, such as bilateral **donors and international organizations** (e.g. FAO; Rampa & Knaepen, 2019).

The agency of all these foreign actors is shaped by the evolution of the food and agriculture sector in Kenya but also by their own self-interest. How the two play out to influence Kenya's food system is different for different cases and different international actors, but **some of them can have a strong impact on the incentives structure at play**, as shown in the following section.

## 2.4 External drivers

Here we identify various “external” factors that drive food system outcomes in Kenya, starting with coronavirus, and including global and regional market factors, multilateral initiatives and agreements, global challenges and global actors.

In 2020, a combination of massive locust swarms and the **COVID-19** pandemic is likely to increase food insecurity in Kenya. The Kenyan locust swarms are the highest in 70 years, and threatens food security (FAO, 2020). The locusts and COVID-19, might hit Kenya particularly hard, as malnourishment has been creeping up since as early as 2012 (World Bank, 2020). Regarding COVID-19, given the unusual high number of Kenyan small farmers engaged in global value chains and Kenya's successful export-oriented agricultural companies, the **downturn in global trade and consumer spending on high-value**

**goods** – such as flowers – places these farmers and companies in peril. Kenya's fresh produce exports to the European Union, for instance, had already halved by the end of March. Furthermore, COVID-19 impacts labour-intensive value chains more than mechanized ones, as labourers might become infected and social distancing is more difficult to guarantee. This is the case for most of Kenya's export-oriented crops – such as tea, coffee, and horticulture.

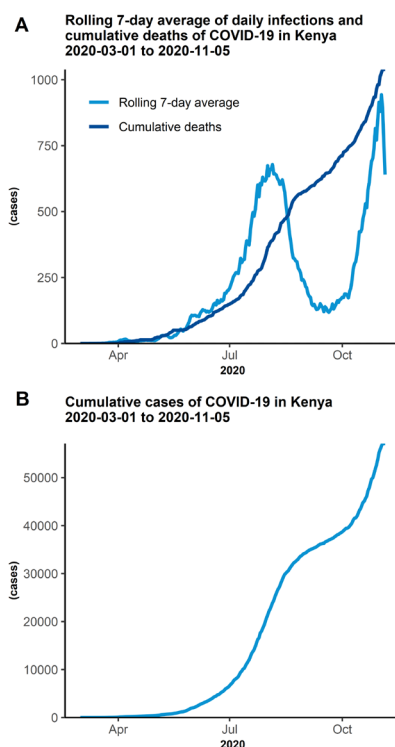
**COVID-19 and the ensuing lockdown measures impact local food systems**, particularly informal wet markets. Given the dusk-to-dawn curfew, vegetable and fruit transporters and vendors are recording losses as transportation from farms becomes difficult, markets close earlier, there are fewer consumers, and tourists stay away. Moreover, COVID-19 also reinforces inequalities within the food system. Given the transport restrictions, markets are less accessible which particularly hampers access to fresh and nutritious food. New initiatives, such as nutritious food boxes ordered online and delivered to the household, target the urban middle- and upper-classes. These initiatives are economically inaccessible for poor urban dwellers or unavailable for rural citizens. The Kenyan government tried to stabilize the food system for instance by ensuring sufficient availability of maize through a three million kg import. Some struggling businesses received reduced tax rates and loan term flexibility is being encouraged, while the government boosted cash transfers to more than one million vulnerable people (GAIN, 2020b).

Additional **damage to food security might come from the decreased economic activity**. The interventions necessary to ameliorate COVID-19's impact could further strain Kenya's public finances. At the same time, remittances from developed countries are down as migrants there are out of work (Bisong & Knoll, 2020). Following the global downturn in economic activity, commodity prices for energy products such as oil have plummeted. Kenya is not a major mineral exporter, so the decline in export earnings is not expected to be high as in Angola or Nigeria. COVID-19 will also impact the financial sector through more loan defaulting and international capital rates rising, while both the government and private sector searches for additional capital. Additionally, it is unclear how fiscal stimulus packages can reach the informal sector, which provides most livelihoods. While export restrictions are not on the same level as during the 2007-08 food price crisis, several cereal exporting countries have curtailed their agricultural exports, such as Ukraine. As Kenya is a net cereal importer – especially rice and wheat – these export restrictions have already affected (at the time of writing) 15 percent of Kenya's imported calories (IFPRI, 2020).

Against a background of population growth, urbanization, and economic development, Kenya's society and food system have undergone dramatic changes in the last few decades. Partly supported by Kenya's food policy, the food system is **transitioning from a traditional food system to a modern one, shown by export-oriented production, distribution concentration, and overnutrition** for an increasing number of citizens, especially in the middle- and upper-classes. This transition is embedded in Kenya's development plan – Vision 2030 – which aims for middle-income status through industrial growth by mimicking Western and Asian development trajectories. Yet better economic, social, and environmental outcomes can be achieved when policy aims to balance these different objectives instead of prioritizing the primacy of economic growth. For the Kenyan food system, this could include reorienting investment, subsidies and extending services for sustainable production and diversification, support for nutrition-sensitive value chains, assisting instead of neglecting informal livelihoods, and inclusive governance. Locally-appropriate healthy and sustainable diets could benefit human health, the environment, and the economy simultaneously, compared with the 'lose-lose' diets of Western food systems, which are resource-intensive and drive overweight (Willett *et al.*, 2019). Already, this dietary change is happening in Kenya.

The policy space for steering Kenya's food system is restricted by its own relatively poor performance and dependence on the global food system and general trade system. There is considerable 'path dependency' in the food systems, with knowledge systems, financial markets, investments and

**Figure 7** COVID-19 indicators for Kenya, March-October 2020



Data: Guidotti et al. (2020), World Bank (2020), Thomas et al. (2020), and John Hopkins University (2020)  
Visualisation: Koen Dekeyser

EAC has relatively high protection against agricultural imports, including non-tariff barriers (Tondel, 2017). Kenya also imports agricultural machinery and agri-inputs from the European Union, such as seeds and pesticides, but little food (Vargas, 2020). Trade with Europe leads to a formalization and standardization of export chains. Furthermore, Europeans themselves invest in the Kenyan agriculture sector, with **FDI and business interests sometimes spilling over into development partners' plans**. For instance, donors have been very active in the dairy sector given its developmental potential but also due to the commercial interests of the European private sector, that in recent years has set up processing or services operations in Kenya and undertaken equity investment (e.g. into the largest Kenyan milk processing company; Bingi & Tondel, 2015).

European trade is so important to Kenya that, in the ongoing trade negotiations between the European Union and EAC, Kenya signalled that it would sign a separate deal with the European Union rather than lose its preferential market access – due to the continued delay of the EAC in signing a deal as a block. By prioritizing its European Union trade relationship over the EAC, **Kenya shows it prefers its current global integration** in food trade to regional integration (Tondel, 2017), even if East Africa is still important for Kenya's food system through imports of maize and pulses (especially from Tanzania and Ethiopia respectively), and exports of dairy (especially to Rwanda and Uganda).

global value chains oriented towards a few crops; transport networks prioritize the global markets; and the advertisement of processed foods. As a result, **monocropping, more unhealthy diets, and export-orientation are implicitly and explicitly encouraged in Kenya**, including through the overall incentive system provided by global markets. Sometimes, these initiatives are financed by development partners. As the influence of these more modern systems grows, lock-in effects make changes harder. At a time when Western societies are grappling with the high environmental and health costs of their food systems, Kenya's food policy could anticipate certain disadvantages of their current food system trajectory and take steps to mediate them.

**Europe contributes to shaping Kenya's food system**, especially formal value chains, through its importance as the key export destination for Kenya's agricultural goods. Total exports to the European Union are smaller than to East Africa (21 percent compared with 25 percent of the EAC) but those to the European Union are all agricultural goods, while only 9 percent of Kenyan agricultural exports go to the EAC. This is largely due to Kenya enjoying preferential market access to the European Union (that has particularly benefited horticulture, fisheries, tea, coffee, and sugar; Republic of Kenya, 2020), while the

<sup>7</sup> Kenya is increasingly doing business with the Middle East and Asia, so this scenario could change in the future.



Preferential trade relations with Europe and regional neighbours influence Kenya's food system more than the World Trade Organization (WTO), given that such preferences cover the large majority of Kenya's agricultural exports and imports. The influence of the WTO, however, is part of the above-mentioned general orientation of Kenya as an open economy. Under its membership of the WTO, Kenya has not substantially increased its access to international agricultural markets, due to those preferences under other trade arrangements such as with the European Union and the remaining high non-tariff barriers in other markets. However, through the implementation of the WTO agreements, other countries have improved their market access into Kenya, often with subsidized food (Kriti-Nganga *et al.*, 2018).

Finally, Kenya's food system is highly vulnerable to the effects of climate change. As part of the Paris Agreement, which Kenya ratified in 2016, the Kenyan government submitted a National Adaptation Plan that included measures for agricultural adaptation. **Given that the Paris Agreement is in its early implementation stages, it will become more important moving forward.** Successful implementation also depends on funding, however, and current public and private funding fails to sufficiently support adaptation measures, particularly in Africa (Tietjen *et al.*, 2019).

### 3 Pathways for improving the food system and value chains of focus

The previous section mapped Kenya’s food system, outlining in broad terms its social, environmental, economic outcomes, sustainability challenges and political economy features, as well as the main drivers, institutions and actors shaping the food system and contributing to those outcomes and challenges.

This section puts forward a proposal for value chains (and territories) of focus for the AgrInvest-Food Systems project. Interventions in these Value chains could alter the outcomes analysed in Section 2 and improve Kenya’s food system by targeting those sustainability challenges. Section 3.1 briefly presents the improvement pathways emerging from our analysis of the key food system outcomes, challenges and drivers, and the subsequent suggestions in terms of value chains and territories with the desirable features. Section 3.2 describes the potential of the two identified value chains to contribute to such pathways and sustainability improvements (discussing the key bottlenecks and opportunities relating to these value chains).

#### 3.1 Improvement pathways: value chains and territories to strengthen food system sustainability

Table 1 summarizes the food system mapping, with its associated challenges and opportunities, and outlines the subsequent **pathways for improving the food system that emerge from our analysis**. These changes to be made to potentially improve specific food system outcomes, and address the sustainability challenges, identified in Section 2 are conceptually quite straightforward. However, unlike with a single value chain and its analysis, it is difficult to attribute an outcome to every food system or challenge a single specific key driver, hence a very specific solution targeting that driver. A food system approach provides the “bigger picture” by looking at interlinkages (across themes and levels) and feedback loops between food system drivers and outcomes. The improvement pathways we suggest are therefore quite broad, some of them targeting certain outcomes and sustainability challenges (shaded in grey) while others target certain drivers (shaded in white). But on the other hand, considering most pathways (or all of them) simultaneously will in principle allow a more explicit identification of the trade-offs from the proposed interventions, and can maximize synergies across multiple goals, increasing coherence between different policies and investments.

**Table 1** Kenya’s food system outcomes and drivers, related challenges, opportunities, and improvement pathways

Food System outcomes and drivers	Food System challenges and opportunities	Improvement pathways and subsequent suggested features of Value chains to be supported
Social sustainability • Food and nutrition security:  • Gender balance:	Prevalence of undernourishment rose from 2012 to 29.4% in 2017, erasing almost two decades of progress. At the same time, the prevalence of obesity tripled to roughly three million Kenyans.	Need for more nutritious food (healthier and diversified diets), including for bigger cities like Nairobi where ultra-processed/ undiversified diets are more common (and more so given COVID: healthier diets can diminish the impact of pandemics via stronger immune systems).
	Food system outcomes tend to be worse for women (e.g. inaccessibility of land ownership for women and related low access to credit).	Need for women’s empowerment at different levels.

**Table 1** Kenya's food system outcomes and drivers, related challenges, opportunities, and improvement pathways

Environmental sustainability	• Land use and forest cover: Agricultural activities occupy slightly more than half of Kenya's land. Forest land has decreased by 3,000 km <sup>2</sup> in the last 30 years.	Need for yield improvements and no land expansion.
	• Biodiversity and soil health: Serious habitat loss and land degradation.	Need to protect agro-biodiversity, diversify planted crops, promote agroforestry to increase tree cover, reduce the negative impact of chemical fertiliser/pesticides.
	• Water management: Agriculture utilizes most water withdrawals.	Need for low water use and promote water harvesting.
	• CO <sub>2</sub> emissions: Food system emits most of Kenya's CO <sub>2</sub> emissions.	Need to invest in relatively low emission food system activities.
Economic sustainability	• Jobs and incomes: Most Kenyans work in agriculture, which is dominated by smallholder farmers with stagnant incomes.	Need to support Value chains that can improve smallholder's income.
	• Diversified production: Agricultural exports dominate formal agriculture and are not very diversified (centred around tea, coffee, horti- and floriculture).	Need for production diversification.
	• Credit availability: Credit flows to agriculture are tiny and declining.	Need for de-risking, high (local/national) market demand and good business cases, and address sectors where the lack of finance is particularly serious.
Socio-economic factors	Prevailing business model (reliance on rain, lack of storage facilities, low processing levels, coupled with other market failures) causes "hunger months".	Need for higher levels of processing (including small-scale processing) to maintain food availability all year.
	Very unequal opportunities (divergence of income growth and investments) between actors in international and sophisticated (often export-oriented) value chains and actors in the traditional, largely informal, food system segment (also given the "supermarketization" of the distributions system).	Need to rebalance support towards traditional/informal food economy (e.g. to improve quantity/quality produced) and local/national market demand, also considering the relationship between economic elites and parts of the state (sometimes includes pressure to marginalize informal players if they compete with formal Value chains).
Environmental factors	Kenya has a high-temperature climate and highly variable precipitation, with climate change already intensifying droughts and expected in the future to negatively affect production (of maize particularly).	Need for on-farm diversification to reduce climate risk, and to diversify staples, with more climate-resilient crops (especially given the importance of maize in Kenya's diets: 1/3 of caloric intake), including intercropping; need to invest in climate adaptation activities more broadly and in farmer-led irrigation.

While the overarching goal of the AgrInvest-Food Systems project is to help stakeholders understand and manage the complex choices around the whole food system, on the other hand it specifically targets sustainable investment in food value chains. Therefore, as the food system approach (Dekeyser *et al.*, 2020) helps us to better understand the consequences of value chain interventions beyond the Value chain (and in terms of the impact on the Value chain of eternal drivers), **the third column of Table 1 also represents the features of Value chains that, if supported, would strengthen the different elements of sustainability**. These pathways for improving Kenya's food system thus also constitute the basis for the suggestion we put forward in which value chains and territories should be supported by AgrInvest-Food Systems in order to strengthen the outcomes and sustainability of Kenya's food system, while taking into account its key drivers.

The result of the combined assessments of the improvement pathways, a political economic analysis, field-based and online interviews and consultations carried out over 2020 under the Agrinvest-Food Systems project, **point to indigenous vegetables and aquaculture as value chains** for AgrInvest-Food Systems focus. Strengthening these Value chains would offer a strong **opportunity to simultaneously**:

- create investment opportunities for private actors in these underserved Value chains, and increase domestic production, subsequently lessening dependence on imports (reducing the necessary foreign reserves, which are already under constraint due to COVID-19, to satisfy food supply);
- contribute to healthier and diversified diets, women empowerment, agro-biodiversity protection, better income and market opportunities for smallholders and SMEs, production diversification and climate-resilience;
- build upon increasing national demand, high potential for processing and synergies with other value chains (including key staples like maize), as well as increasing traction and multi-stakeholder initiatives;
- target sectors that are currently neglected by policies, research and partnerships, and hopefully rebalance national and international support for the traditional/informal food economy; and without posing serious threats, in principle, in terms of agricultural intensive land expansion, CO<sub>2</sub> emissions and natural resources depletion (via chemical contamination).

A territorial focus is also suggested, in parallel to a value chain focus, both to narrow down the complexity involved in Kenya's food system and to increase the chances of successfully contributing to the expected sustainability improvements. The results of the political economy analysis carried out under the AgrInvest Food Systems Project suggest **directing the AgrInvest-Food Systems Project's efforts towards the territories from the National Capital to Lake Victoria, with Nairobi, Nakuru, and Kisumu as the principal urban centres** (and the flexibility to work with other counties surrounding the Lake, such as Busia and Vihiga as major producers of indigenous vegetables for instance). **This is justified by various elements**:

- these are among the parts of Kenya with the **highest volumes of production** of indigenous vegetables and aquaculture, and with the potential to further increase the production levels, given they are located on Lake Victoria or within the 18 percent of the country's land classified as having "medium to high agricultural potential";
- not only the agro-ecological features and water availability of these zones, but their **broad economic and infrastructure conditions**, including an already supportive business environment for successful food industries (e.g. dairy and horticulture in Nakuru county), could be exploited to serve the competitiveness of Indigenous vegetables and aquaculture and allow for significantly expanded production, potentially serving the more arid parts of Kenya as well;

- all three proposed counties house large populations that would directly benefit from the economic opportunities and the broader local food system improvements resulting from enhancing these two value chains: Nairobi County is the most populous in Kenya (4.4 million, mostly Nairobi city), Nakuru County (ranks third; 2.1 million), and Kisumu County (ranks 13th; 1.2 million), totalling 7.7 million people; these figures specifically represent a **very large potential consumer market** for Indigenous vegetables and aquaculture products, which is also a crucial requirement for attracting more investment into the Value chains (Nairobi city alone is by far the most important domestic food market in Kenya, with 12 percent of the total population and higher income availability, including a willingness to pay a premium for safer/quality/processed fish and vegetables);
- these territories constitute a **continuum of market access and broader spatial development opportunities** (Byiers *et al.*, 2016), from rural areas (where the majority of small producers live) to peri and urban areas (with most consumers and market outlets and a wide range of services and food processing activities): they are very well connected by the A104 Road, one of the most important highways in Kenya (linking Nairobi with the border with Uganda), and are along the Northern Corridor, one of the most important transport routes in East Africa (from the Port of Mombasa to landlocked Uganda, Rwanda, Burundi and the DRC), both of which are already in good conditions and currently under further improvement;
- large parts of the proposed counties also face **challenges of over-exploitation of certain natural resources** (forests, water, soils, fish stocks, and other biodiversity) partly due to intensive chemical-based monocropping using a large-scale agricultural model, and little crop diversification; so it will be important to test the possibility of combining social and economic development with environmental sustainability through Indigenous vegetables and aquaculture;
- the proposed areas **host important multi-stakeholder efforts in support of more sustainable food systems** that AgrInvest-Food Systems could build upon, such as the Nairobi food system strategy and platform (that includes efforts to source more nutritious food via shorter Value chains and neighbouring counties) and many other initiatives by county governments, NGOs, businesses and international partners;
- substantial support from national authorities and international donors has historically gone, and is still going, to the Arid and semi-arid lands regions of Kenya given their higher levels of food insecurity; while a consensus seems to be emerging recently, including within the GoK, that **other parts of Kenya should receive more international support**, especially to exploit, also through better task division among partners, the characteristics of each specific territory for the benefit of the overall economy and population in Kenya;
- despite such a territorial focus, some of the policy and investment measures that AgrInvest-Food Systems will facilitate to strengthen the indigenous vegetables and aquaculture value chains will be national in nature and would hopefully **benefit the whole food system in Kenya**; and it is also hoped that the project's results and lessons on local-level initiatives would benefit other counties in Kenya.

### 3.2 Opportunities and challenges for the value chains of focus: sustainability, commercial potential and political traction

This section offers a broad analysis of indigenous vegetables and aquaculture in Kenya as the value chains to be prioritized by AgrInvest-Food Systems given their significant potential to improve the outcomes and sustainability of Kenya's food system. As the respective size and depth of the analysis below might suggest, the **two sub-sectors may be at a different level of readiness for the type of support that AgrInvest-Food Systems intends to promote**. The Indigenous Vegetable value chains (section 3.1) – better researched in the territories and counties of AgrInvest-Food Systems focus– offer a more enabling environment for multi-stakeholder efforts aimed at attracting public and private investments aligned to the SDGs (including efforts led

by AgrInvest-Food Systems partners like ECDPM over the past two years). Aquaculture (section 3.2) is proposed as the “second level priority” for the project, as more information on sustainability and political economy dynamics is required, and more preparatory work needs to be done to advance multi-stakeholder dialogue towards commercial feasibility and political traction in the territories of focus. This was confirmed during the interviews and consultations that started in Kenya as part of AgrInvest-Food Systems in February 2020.

### 3.2.1 Indigenous vegetables

This section discusses the Value chains of indigenous African vegetables, also called “orphan crops”, “high-value traditional crops” or “Neglected and Underutilized Species”. An increasing body of literature describes the multiple sustainability benefits of indigenous vegetables, and thus their potential to contribute to several SDGs: they are generally highly nutritious, they commonly have low requirements in terms of natural resources and farming inputs, and they can contribute to increasing (agro)biodiversity and climate resilience. Their diversity also allows income to be generated for the rural poor, especially for women who often cultivate, process and market indigenous vegetables (Baldermann *et al.* 2016; Chivenge *et al.* 2015; Rudebjer *et al.* 2014). Furthermore, indigenous vegetables are suitable for intercropping with staple crops, thereby enhancing crop productivity and nutrient-use efficiency and, at the same time, providing the basis for a better balanced diet (Ebert, 2014). Not only are they widespread in Africa and Kenya in particular; some of them, like amaranth, are becoming increasingly popular on global healthy food markets as “superfoods” due to their nutritional properties<sup>8</sup>.

In this section we focus on four indigenous vegetables *Amaranthus* (terere in kiswahili), Cowpea (kunde), Nightshade (managu), and Spiderplant (saget). They were selected for their importance in Kenya, taking a food system approach i.e. for economic, social and environmental sustainability and their wide diffusion at production, distribution and consumption level. They are widely present in different regions of Kenya, basically everywhere in the non-arid areas (arid being East, North, partly Coastal region): Western, Central (including Nairobi), Nyanza, Rift Valley (excluding the arid parts i.e. Turkana and Baringo counties), and to lesser extent in the non-arid Coastal region. Abukusta (2010) has conducted a very useful prioritization exercise (“Priority African Indigenous vegetables with Nutritional and Economic Potential”) on the most important Indigenous vegetables in Kenya via surveys about their diffusion and laboratory analyses, in other words on their nutritional and economic potential: household surveys, market surveys, the presence of processed food derived from these indigenous vegetables, in addition to their nutritional potential. The same prioritization of amaranthus, black nightshade, cowpea and spider plant, was confirmed, among others, by the SASS project over 2018-19, based on their diffusion as well as their commercial and sustainability potential<sup>9</sup>.

Many of the considerations in this section for the strength and weaknesses of these four Indigenous Vegetable Value chains apply to other Indigenous vegetables or high value traditional crops, and the AgrInvest-Food Systems project’s interventions do not intend to exclude other Value chains to be supported. For example, the Bambara groundnut (*Vigna subterranean* L. Verdc) is a grain legume cultivated for its subterranean pods, mainly by subsistence farmers in semi-arid areas of sub-Saharan Africa. In Kenya it is less common in terms of production, distribution and consumption compared with the top four (grown mainly in the Western, Nyanza and Coastal regions, with a recent introduction into Central Kenya) but has similar sustainability benefits. It is considered a complete food because its seed contains about 63 percent carbohydrate, 19 percent protein and 6.5 percent fat. It is richer than groundnuts in essential amino acids. The Bambara groundnut has a gross energy value that is greater than that of other common pulses, such

<sup>8</sup> For more details on the properties of amaranth, see the “Amazing Amaranth Project” of the World Vegetable Center (<https://avrdc.org/amaranth-amazes-in-africa/>)

<sup>9</sup> The Sustainable Agri-food Systems Strategies (SASS) project aims to contribute to the ongoing debates and initiatives on increasing the sustainability of food systems, by examining the role of neglected and underutilized species or indigenous vegetables. More information is available at <https://ecdpm.org/dossiers/sustainable-agrifood-systems-strategies/>

as lentils and pigeon peas. The crop also has weed-suppressing characteristics, especially against striga which is widespread in western Kenya.

Despite the very high potential of Indigenous vegetables for economic, social and environmental sustainability and food security (3.1.1) as well as increasing political feasibility and traction to support these Value chains (3.1.2), the production, consumption and value addition levels for these indigenous vegetables in Kenya are on aggregate low, due to several Value chains bottlenecks. Some of these are related to political economy dynamics that create a sort of overall bias in favour of other crops. Pathways to solutions however are already under way (3.1.3).

### **Box 3. The case of Amaranthus**

Amaranth exists as a grain and as a leafy vegetable. First, compared with staple cereal crops, the grain amaranth is early maturing (less than three months), can be grown several times a year and tolerates drought, heat stress, high soil acidity and salinity. Amaranth seeds contain 8-17 percent of edible oil, useful for both domestic cooking and industrial purposes. The oil contains a special component known as squalene, found only in in dogfish liver, whale fish liver oil and shark liver oil. Additionally, it is claimed that several more diseases are prevented, managed or healed by this grain. Grain amaranth has potential for increased production due to the low cost of inputs and its adaptation to a wide range of agro-ecological zones. Second, amaranthus, as a leafy vegetable, has been integrated into local communities' culture as food over many generations. Leafy vegetable amaranth contains superior levels of carotene, vitamin C, protein, iron, calcium, magnesium, fibre and antioxidants compared with exotic vegetables such as cabbage.

In Kenya, the traditional amaranth has been used as a vegetable but was long regarded as a food for the poor. In the recent times, both the traditional leafy vegetable amaranth and grain amaranth have become increasingly attractive food groups for upper income groups, particularly in urban and peri-urban markets, and for vulnerable groups with special nutritional needs (e.g. HIV/AIDS infected people). However, the high nutritional and medicinal value of amaranth remains insufficiently known among consumers. Recent statistics show that leafy vegetable amaranth is grown under 1,679 ha with a production volume of 17,445 MT valued at KES 524 million while the grain amaranth is grown under 682 ha, with a production volume of 3,068 MT valued at KES 202 million (HCDA 2012). The leading leafy vegetable amaranth producing counties in Kenya are Kilifi, Kisii, Murang'a and Lamu while the leading grain amaranth producing counties are Nyamira, Migori, Busia and Nandi.

### **Relevance to sustainability objectives**

This subsection shows that Indigenous Vegetable Value chains already contribute to positive and *sustainable food system outcomes, from the environmental, social and economic perspective, but the potential is much bigger*. While it is difficult to quantify these benefits due to a lack of Kenya-wide data, the Indigenous vegetables are widespread in several parts of Kenya in the majority of family farms that are the majority of Kenyan farms. This, together with the existing literature and our recent interviews, confirm the current and potential role of Indigenous vegetables for food system sustainability.

### **Social sustainability and further potential**

Indigenous vegetables currently contribute to social sustainability mostly through providing access to healthy and nutritious foods that are affordable for the poor and empowering vulnerable groups, especially women.

**Indigenous vegetables are very nutritious and provide micronutrients as well as a diversified diet** to many Kenyans (beyond staples). This is very important in a country like Kenya that is considered a food insecure country with a high prevalence of undernutrition (i.e. diets do not provide enough nutrients) and low dietary diversity (e.g. maize provides one-third of caloric intake). Although Kenyans consume vegetables relatively frequently on average, most often it's only a few varieties and not the species that provide most of the required nutrients: cabbage and kale are the most consumed, nutritionally poor compared with indigenous vegetables. Spiderplant is rich in vitamins A and C; nightshade is high in iron, amaranthus is high in calcium; and cowpeas contain high levels of amino acids and proteins (Cena, 2018). Not only are Indigenous vegetables nutritious per se, but a diet rich in traditional leafy vegetables promotes the intake of compounds beneficial for human health that are present in other foods e.g. that have great anti-inflammatory and antioxidant characteristics.

Indigenous vegetables **empower women** since the production, handling and marketing of indigenous vegetables are mostly done by women, with profits generally considered high by those involved. Recent studies show that in almost 80 percent of the households surveyed, it was women who kept the income from sales of the leafy greens (van Etten *et al.* 2018). This offers women a more regular or stable income, increasing women's freedom to make economic choices

Finally, another social dimension is that the **traditional knowledge** attached to Indigenous vegetables can lead not only to acknowledgement of and respect for people's cultural identity, but can also contribute to new or better uses or improved processing technologies for the indigenous products themselves.

Promoting stronger Indigenous Vegetable Value chain would create **further potential** for improving social sustainability within the Kenyan food system, both through processing and storage as well as additional diversification dynamics. Indigenous vegetables offer high processing opportunities, that would both **extend the capacity to store and preserve the products for longer** (dried and fermented compared with fresh), as well as enhance the nutritional content of the derived products, e.g. of maize-meals obtained by mixing dried Indigenous Vegetable and maize flours (already on the Kenyan market: *kunde* in maize flour). For example, the inclusion of amaranth in breads and gluten-free products has been researched: in bread, a mixture with 15 percent amaranth flour adds proteins (while not affecting the taste or form of the bread, Perez-Rea and Antezana-Gómez, 2018). Drying of Indigenous vegetables, not widespread and yet already undertaken by some Kenyan companies and millers, boosts the capacity of the stomach to absorb minerals (according to results obtained at Jomo Kenyatta University of Agriculture and Technology). Fermentation of Indigenous vegetables, not yet practised at commercial level, would be able to boost the antioxidant characteristics of Indigenous vegetables and improve their safety (decrease pathogens)<sup>10</sup>. More broadly, increasing the role of Indigenous vegetables in the food system would support diversification of consumption, considering the interactions between Indigenous vegetables and the key staple maize and that it is normal for Kenyan consumers to mix the two on their plates.

### **Environmental sustainability**

Indigenous vegetables currently contribute to environmental sustainability, including climate resilience, in various ways. Indigenous vegetables are **well adapted to harsh climatic conditions**, can produce seeds better in tropical environments and are characterized by **lower natural resource requirements** compared with more commercial, exotic vegetables, and intensively farmed crops. For instance, the Bambara groundnut is tolerant of poor quality soils and can yield a crop in conditions where the common groundnut cannot; Amaranthus is C4-

<sup>10</sup>Misci, C., Taskin, E., Bandini, F., Dall'Asta, M., Bertuzzi, T., Imathiu, S., Sila, D., Cocconcelli, P. S., Puglisi, E. 2020 Fermentation as a tool for an increased food security for African leafy vegetables: Cucurbita sp. fermentation (forthcoming)



photosynthetic species therefore it can save more water than the common C3-based crops such as rice, wheat, and potato (Griffiths, Weller, Toy, & Dennis, 2013);.

Most Indigenous vegetables have an in-built ability to withstand and tolerate many biotic and abiotic stresses (Abukutsa 2010) such as drought or local pests, so compared with conventional, commercial, horticulture, Indigenous vegetables need less chemical input, both fertiliser and pesticide, which are often harmful to air, soils, water and biodiversity; and they respond very well to organic fertilisers.

Indigenous vegetables are an important part of Kenyan agrobiodiversity and are better adapted to local disease infestation, so they are easier to grow in comparison to their exotic counterparts. Indigenous vegetables grow faster and can be harvested more times per year compared with many other crops, hence **supporting climate resilience** against droughts, erratic rainfall and other unpredictable weather conditions that are increasing in Africa due to climate change. Preserving and promoting them thus maintain crop diversity at the individual farm level and reduces the individual risk for farmers of crop failure due to climatic events and/or the incidence of pests and diseases. Moreover, thanks to their genetic diversity, Indigenous vegetables also reduce the aggregate risk for the Kenyan food system of future crop failure due to changing climatic conditions, hence they strengthen the overall environmental stress and climate resilience

Moreover, most of the vegetables occupy little space on the plot and are often intercropped and rotated with other crops (many Indigenous vegetables fix atmospheric nitrogen and are therefore suitable for intercropping systems with cereals and root crops), so their (expanded) **production does not necessarily have negative consequences in terms of land use or soil over-exploitation**; on the contrary, it can enhance other crop productivity and nutrient-use efficiency. Indigenous vegetables also tend to constitute shorter value chains compared with many staples and with more commercial horticulture, hence they have smaller negative environmental impacts due to transport and other logistical services.

Finally, the positive ecological and environmental interactions of Indigenous vegetables with the rest of the food system, such as suitability for intercropping and nitrogen fixation (including with staple crops such as maize and beans), hence healthier soils (soil organic matter improvement), also indicate **further strong potential for improving environmental sustainability** in Kenya via the expansion of Indigenous vegetables.

### **Economic sustainability and commercial potential**

Currently the Indigenous Vegetable value chains in Kenya are relatively sustainable from an economic point of view, as they support the jobs and incomes for a certain share of the population over time in several counties, with a clearly rising demand for these vegetables. Their commercial potential is increasing with growing markets at local/national and partly regional/international levels, hence improving the prospects for return on investment in the value chain. However relatively low production and consumption volumes and many bottlenecks in the Value chain currently limit the role of Indigenous vegetables in the food system.

As explained above, Indigenous Vegetable are **suitable to be grown in low-input farming systems** in harsh environments like many parts of Kenya. They have a short growth period with most of them being ready for harvesting within 3-4 weeks, hence can be produced more times per year compared with many other crops. This is a potential incentive for farmers who do not grow Indigenous vegetables yet to adopt these crops, also as a risk diversification strategy. Moreover, indigenous vegetables tend to be complementary, both at the level of production and consumption, to some of the most widespread crops and staples in Kenya such as maize and beans: on the plot through intercropping, and in the plate as cooked Indigenous vegetables are usually served with ugali.

Relative to their “competitors”, i.e. conventional horticulture for local markets (common cabbage, kale and especially sukuma wiki), **indigenous vegetables tend to be more profitable** as they attract higher farmgate prices and have lower costs due to less chemical input (both fertiliser and pesticide). Evidence from a number of projects confirms this profitability and the economic benefits of Indigenous vegetables for smallholder farmers and women in particular.

In general, **Indigenous Vegetable demand and market access are both growing significantly**. Indigenous Vegetable are increasingly finding their way into many different points of sale in Kenya, i.e. many sources where consumers go and purchase their food: small shops, informal open-air markets, small neighbourhood groceries, town markets, ever expanding supermarkets, street vendors and informal redistributive networks (e.g. based on gifts and opportunistic selling, linked to consistent internal migration within Kenya). Market surveys show that the demand for indigenous vegetables is not fully met in Kenyan urban and peri-urban markets. There are even potential regional and international markets<sup>11</sup>. For instance, people in the diaspora in Europe and the United States are buying dried indigenous vegetables shipped from Kenya and have expressed an interest in purchasing a wider variety of indigenous vegetables (Abukutsa-Onyango, 2010). The most significant amount of indigenous vegetables is offered in food kiosks and open-air markets throughout Kenya, and in bigger cities, including Nairobi, indigenous vegetables are also increasingly sold in supermarkets, and to hotels and restaurants to be promoted as “authentic, traditional dishes”. For instance, Amaica, a small but significant restaurant chain in Nairobi, buys its cowpea leaves and spiderplants from groups of women growers. Amaica distributes the vegetables to its eateries in Nairobi, including its new outlet at Jomo Kenyatta International Airport (see the picture below). Other branches will soon be opened outside the capital.



Photo 1. Kunde dishes served as “traditional food” at JKUAT Airport restaurant

However, such vegetables are mostly eaten at home and only their surplus is sold to street vendors and middlemen; so although demand for them is increasing (especially among the growing middle class in urban areas), supply remains limited. A number of factors (to be further discussed in the last section) explain the weakness on the production side of the Value chains, including reliance on rain (two rainy seasons) and a lack of irrigation, limited productivity, policy neglect, inconsistent quality; and on the market access and marketing side, including insufficient detailed information for farmers about markets, safety concerns of consumers, and uncertainty about contracts for buyers and processors. Indeed, rainfed farming of Indigenous vegetables mostly involves women who often sell their surplus

Interviews carried out under the Agrinvest-Food Systems project in February 2020, with various stakeholders including farmers, SMEs, consumer organizations and supermarkets in Nairobi, also confirmed that demand for Indigenous vegetables is booming in urban markets; but **current weaknesses along the Value chain keep production and consumption volumes low and access to markets difficult**.

The majority of smallholder farmers and families living in Kenyan (non-arid) rural and peri-urban areas produce small quantities of one or more of these Indigenous vegetables (amaranthus, black nightshade, cowpea and spiderplants).

<sup>11</sup> One of these market surveys was conducted, for instance, as part of the project “Systemic approach to overcoming constraints of production and marketing of indigenous vegetables in Western Kenya”: <https://www.nwo.nl/en/research-and-results/research-projects/i/14/12214.html>

to farmgate buyers in small quantities and have limited experience of direct access to local markets. Farmers recognize that direct access to markets is costly, due to transport, tax collection, and time factors. So this remains, with a few exceptions, a **largely informal and unorganized Value chain that cannot sustain the jobs, incomes and profits of a large number of people and businesses over time**, which would be required for financial markets to be interested (for return on investment in the Indigenous Vegetable value chain).

**Notable exceptions** include public investment in Indigenous Vegetable research and value chain development by Kenyan organizations (universities like JKUAT; the Busia and Vihiga county governments) and international organizations and donors (Bioversity, Germany, EC), as well as private investment and successful business cases led by seed companies (eg Simlaw Seeds), local farmer organizations (eg SINGI), processors (e.g. MACE Foods), and Value chain aggregators (FCI's business arm) that create jobs, incomes and profits sustainably in various parts of Kenya.

These concrete cases and the booming aggregate demand for Indigenous vegetables in the national market indicate a strong commercial potential for Indigenous Vegetable Value chains, hence good return on investment prospects, together with a number of additional elements.

Some of the indigenous vegetables, including amaranthus and cowpeas, offer a **double production and market opportunity: the grains and the leaves**. Even though in Kenya this is currently mostly unexploited (with leaves used much more than grains), farmers can produce, consume and sell the leaves as cheap sources of quality protein as well as the grain (or seeds) from the same plant, both for consumption and processing into seed oils. This dual purpose can be transformed into a double production to be sold on the market, which is an important incentive for increasing production of Indigenous vegetables.

Despite current limited production volumes and weaknesses at the individual farm level, it would not be difficult through better organization of the Value chain (especially via better aggregation, storage and transport) to upscale production to meet the growing national demand, considering that in many counties in Kenya most families already plant Indigenous vegetables and the **different agro-ecological zones** (within and between counties) with their different climates and rain patterns could collectively ensure the supply of Indigenous vegetables all year round.

**Processing Indigenous vegetables** (drying and fermentation of leaves, oil from grain Indigenous vegetables, product development such as maize flour blending, breads and chapatis, pasta, etc.) represents another important part of the commercial potential of the Indigenous Vegetable Value chains, as it is crucial to extend the shelf life of these nutritious foods (given Indigenous vegetable's perishability), to increase value within the chain and to create new market opportunities. While consumer acceptance of processed Indigenous vegetables is not yet widespread (most consumers prefer the fresh vegetables), there are already successful business cases (e.g. MACE Foods drying and packaging Indigenous vegetables; Equatorial Naturals fortifying ugali flour with terere, as in picture



Photo 2. Ugali flour with terere, Nairobi supermarket

below; etc.), and further Indigenous vegetable-based products could be developed and targeted at different market segments, distinguishing them by both income group and point-of-sale (supermarkets versus more/less informal town markets, Kenyan diaspora versus local consumers, etc.). Urban dwellers and the middle and upper-class already increasingly demand dried indigenous vegetables because their preparation time is shorter than for fresh vegetables, and in certain rural communities, especially Western Kenya, the fermentation and drying of Indigenous vegetables is a well-accepted traditional practice.

### **Political feasibility and traction**

In general, policymakers, public authorities, private investors, civil society and development partners in Kenya have not prioritized the Indigenous Vegetable value chains. However, the **political feasibility and traction to support Indigenous vegetables is clearly picking up**, given the increasing market demand and general awareness about food quality (also backed by growing scientific information about Indigenous Vegetable benefits), the recent initiatives by local governments, NGOs and international partners, as well as other political economy dynamics.

As seen above, the demand for Indigenous vegetables is booming in major cities and other parts of Kenya, and given that ultimately 'money talks', and that supply will follow increased demand, it is very likely that policymakers and other stakeholders will have an incentive to enable the growth of these Value chains. In particular, in the last few years, **consumers' health concerns have regularly been making the newspaper headlines** in Kenya which strongly influences politicians' priorities and has also led to increasing consumer willingness to buy healthy food like Indigenous vegetables (with the prospect of an increased supply potentially keeping the prices stable and thereby addressing legitimate concerns about affordability for resource-poor consumers). Local (KALRO and JKUAT) and international (African Orphan Crop Consortium, HORTINLEA and SASS) research about the nutritional value of Indigenous vegetables, and related awareness campaigns on national media, have contributed to this growing focus on Indigenous vegetables. Preliminary reports also indicate that demand for Indigenous vegetables has been soaring during the COVID-19 pandemic, with cowpeas, nightshade and spiderplants being preferred to other vegetables like spinach and cabbage thanks to their lower prices, longer shelf life and better nutritional content (Kenya News Agency, 2020)<sup>12</sup>.

**Important recent initiatives indicating the rising political feasibility and traction** of strengthening Indigenous Vegetable Value chains by local governments, NGOs and international partners, include the cases of certain county administrations. With the assistance of Bioversity International, the Busia government adopted the biodiversity policy that includes the promotion of Indigenous vegetables (including via extension officers), and the Vihiga county set aside KES 40 million to support Indigenous vegetables. The authorities in Trans Nzoia county also allocated funds to support farmers to buy quality seeds of Indigenous vegetables, and the Nakuru County Development Plan 2017 included Indigenous vegetables as priority crops, with the current administration willing to launch a Public Procurement programme to source Indigenous vegetables for local schools and hospitals. Local NGOs like Seed Savers Network (supported by Hivos) documented and characterized local Indigenous Vegetable seed varieties, contributing to the preservation of genetic plant resources in Kenya, and preparing for the promotion and commercialization of these varieties. Organizations like Slow Food Kenya, Organic Consumers Alliance and the Kenya Organic Agriculture Network are also contributing to traction by linking Indigenous vegetables to the organic movement and to sustainability-oriented restaurants (Chefs Alliance) and tourism (Slow Safaris) industry in Kenya.

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<sup>12</sup> <https://www.kenyanews.go.ke/demand-for-indigenous-vegetables-soar-as-residents-grapple-with-covid-19-economic-shocks/>

At the national level, moreover, despite the general neglect in the past in terms of public finance and other means of implementation, the national government and policy processes also point to a **regulatory environment that is ready to enable more concrete support for Indigenous vegetables**. “High-value traditional crops” are recognized as a policy priority by the national Crops Act (2013) and the Ministry of Agriculture, Livestock and Fisheries has recently indicated a process for “maize flour-traditional crops blending” guidelines, which could strongly boost demand for processed Indigenous vegetables including by the very influential maize milling industry. The new Agricultural Sector Growth and Transformation Strategy (ASTGS) moreover indicates among the future research focuses for Kenya “the commercialization and development of indigenous crops and livestock which may be better adapted to the areas which are at risk to climatic issues” (Republic of Kenya 2019).

Moreover, considering that political economy dynamics can often interfere with public and private support for specific Value chains, **no opposition to the above-mentioned traction and feasibility is expected from established business or farming interests** in Kenya as Indigenous vegetables do not pose a commercial threat to established economic or other interest groups.

**Finally, recent interviews and consultations conducted under the AgrInvest Food Systems Project in 2020 confirmed** both private sector interest (all levels, from farmers to SMEs to banks) and growing public sector appetite for Indigenous Vegetable strengthening (e.g. in the search for a government-led strategy towards “other staples than maize” given its uncertain future due to climate change, as was clearly stated during interviews, e.g. with the Agricultural Finance Corporation).

#### **Value chain bottlenecks, possible solutions, and likely champions**

Despite the strong potential of Indigenous vegetables to improve food system sustainability and the rising political traction to support them, several Value chain bottlenecks limit their production, consumption and value addition in Kenya.

At the **production level**, obstacles to growth start with limited seed availability. Although the large parastatal Kenya Seed Company has selected and registered seeds for the main indigenous vegetables, seeds are not easily available at agrovet shops in adequate amounts. Laws restrict the sale of farmer-saved seeds that have not undergone the costly certification process; and there is no incentive for private seed companies or retailers to enter the Indigenous Vegetable market given the higher profitability of hybrid seeds and ‘conventional’ crop seeds. This is part of a broader **“food system-bias” in favour of some staples and export-oriented horticulture** and against Indigenous vegetables, with different types of incentives encouraging small, medium-sized and large farmers to grow maize for the local market and the likes of French beans for foreign markets. It can be assumed that the economic power of these agricultural sub-sectors, dominated by large agribusiness (and influenced by the government in the case of maize), and the revenues they generate for both companies and the government, drive decisions about agriculture support policies and investments (SASS 2019). Moreover, many Indigenous vegetables like amaranthus, black nightshade and cowpeas would require irrigation for upscaled production volumes, which is a structural infrastructure bottleneck in Kenya, addressed only in specific cases such as to support export-oriented horticulture and floriculture<sup>13</sup>; therefore, most smallholder farmers only produce Indigenous vegetables during the two rainy seasons.

<sup>13</sup> More recently, however, the MOALF has also been investing in farmer-led irrigation as infrastructural requirements for big irrigation projects tend to be riddled with corruption. The MOALF supports farmers with water harvesting infrastructure such as water pans and irrigation kits.

At the **distribution level**, indigenous vegetable Value chains are constrained by difficult market access conditions, to a certain extent by unstable demand in rural areas (compared with other crops like maize and export-oriented horticulture), and perishability (they must be sold fresh and cannot be easily stored and transported to distant markets without deteriorating). This also determines a strong price volatility over time and variability across market locations in Kenya, also influenced by the seasonality of Indigenous vegetables, which act as an additional distribution disincentive limiting both production and consumption. Moreover, even in cases of more stable and clearly upward demand, as in the urban middle and upper-classes, the distribution system needs products to comply with formal quality standards. Fast-growing supermarket chains in large and small urban areas require consistency of quality and certification, leading to high rejection rates for smallholders' produce and relatively high prices of Indigenous vegetables.

**Consumption** volumes are generally kept low in Kenya partly due to the relatively higher prices of indigenous vegetables (fresh produce in low supply) compared with staples like maize (and kale) that are easier to store and transport (and enjoy more established and effective distribution networks). Hence, they are more difficult for the majority of poor people to afford. Indigenous Vegetable consumption growth is also constrained by food safety issues (real or perceived) and the related lack of trust and traceability systems around the origin of production (e.g. Indigenous vegetables from Western Kenya are generally known to be safe and tasty, while those produced in the Naivasha Basin are stigmatized since it is known to be a hotspot for export-oriented, heavily chemical-based, horticulture). Moreover, there is still, to a certain extent, a problem of 'lower status' frequently attributed to traditional foods by consumers, especially the youth who prefer more 'modern' diets. Cultural resistance to processed Indigenous vegetables is still relatively strong, as most consumers prefer the fresh version, even if in urban areas (and the diaspora) the middle and upper-middle working classes increasingly choose dried Indigenous vegetables or derived products, especially due to their reduced cooking time.

In addition to such partial consumer resistance, and despite the clear advantages in terms of all-year-round availability and to some extent the nutritional profile, Indigenous Vegetable **processing** suffers from all the bottlenecks in the downstream parts of the Value chain, together with the fact that processed vegetables are more expensive than fresh ones, hence they tend to be out of reach for poorer households. Therefore, value added products are still quite rare on the market, with the informality of the Indigenous Vegetable business acting as an additional disincentive to processing as contracts between farmer-buyer-processors are particularly difficult to enforce.

Additional political economy insights point to **combinations of these bottlenecks in different parts of the Value chain and feedback loops between their respective impacts**, all contributing to the current economic incentive structure that is not supportive of Indigenous Vegetable growth. The largest group of Indigenous Vegetable producers, i.e. smallholder farmers, are mostly scattered in the rural areas, unorganized and poorly assisted by extension services rarely promoting Indigenous vegetables. Hence they are poorly supported by weak alliances among themselves and ultimately driven by the agendas of the rest of the actors in the Value chain, especially input providers and middlemen. This justifies their reluctance to diversify and grow more Indigenous vegetables, which would in principle allow them to connect more effectively to consumers (and processors) in urban areas. This is compounded by unstable Indigenous Vegetable demand and difficult market access that, coupled with perishability, make it less attractive for both farmers and middlemen to market Indigenous vegetables (compared with other crops like maize or kale or export horticulture); and also not worth investing in changing such bias to produce and trade more of these vegetables. The potential processors' need for raw vegetables at low prices but of consistent quality represent the opposite agenda that most smallholders pursue, which also makes the Indigenous Vegetable value addition a difficult business. The consumers' arena of influence

within the food system can be large: they can drive producers' and distributors' choices via market demand; but this would require much stronger alliances between consumers and the other local actors. Lastly, the high costs of formalization (licences, registration fees, taxes, and contract enforcement) contribute to keeping the Indigenous Vegetable chain informal. Informality contributes to limiting the transparency of information along the Value chain, and further enhances the uncertainty of the demand for Indigenous vegetables, especially on the more formal (and lucrative) markets in Kenya which in turn limits the incentive to produce, process and distribute more of these vegetables.

A final, crucial, constraint on the development of the Indigenous Vegetable Value chain is the **limited access of all Value chain actors to affordable finance** to improve their business. This is associated with the high levels of perceived risk and transaction costs that a financial intermediary would face in this Value chain, largely determined by all of the above bottlenecks, together with the limited availability of collateral and insufficient business skills among smallholders and small-scale entrepreneurs (the majority of the Indigenous Vegetable Value chain players).

**Potential solutions to all these constraints**, in general, should contribute to changing the current political economy incentive structure that works against an upscaling of the Indigenous Vegetable Value chain (and to a large extent a food system bias in favour of staples, especially maize, and export-oriented horticulture). The production side of the Value chain for instance should be improved through better extension services for indigenous vegetables; relaxing rules that are too restrictive for smallholders to allow the multiplication and marketing of a wide variety of Indigenous Vegetable seeds; public investment in storage and aggregation centres specifically for Indigenous vegetables so farmers can aggregate and store their fresh produce, hence obtaining better prices and lower rejection rates. The distribution and consumption of Indigenous vegetables should be improved through: better governance of the distribution system, e.g. providing incentives to middlemen to increase the supply of Indigenous vegetables to the different types of local markets; regular market research to clarify the characteristics of Indigenous Vegetable demand throughout the year in particularly interesting market segments (e.g. the bottom of the consumer pyramid; the Nairobi markets; the tourism sector); sensitization campaigns to create awareness about Indigenous Vegetable benefits and overcome consumer trust issues. Better incentives on the processing side would include: a better regulatory framework and the diffusion of small-scale technologies for the drying and fermentation of Indigenous vegetables; awareness campaigns to address cultural inertia against some Indigenous Vegetable processed products. All such solutions would also constitute an improved enabling environment for investing in the Indigenous Vegetable Value chain by contributing to de-risking it, and could thus facilitate, together with the development of financial products tailored to the needs of Indigenous Vegetable farmers and processors, more affordable finance to the various Value chain players.

Some of these potential solutions, or a combination of them, have been **proposed or are already being pursued as part of the successful business cases and other recent initiatives** in support of Indigenous vegetables indicated above by county governments, NGOs and international partners. Just to name a few, **MACE Foods**, an SME based in Eldoret, has made the drying, packaging and sale of Indigenous vegetables a thriving business, contributing to: formalizing the local Indigenous Vegetable Value chain (especially via a vertically integrated marketing chain with a focus on



Photo 3. MACE's dried cowpeas, nightshade and spiderplant, Nakuru supermarket

product quality); improving market access, stability of income, and access to quality seed for smallholders via contract farming with MACE Foods; increasing availability of dried Indigenous vegetables the whole year round in Kenyan supermarkets in Nakuru and Nairobi; helping the Kenya Bureau of Standards launch a national standard for four dried Indigenous vegetables (largely based on the characteristics of MACE's products; picture below); and convincing the Trans Nzoia county administration to buy Indigenous Vegetable seeds to distribute to farmers. Another example is Smart Logistics Solution, a Kenyan agri-business connecting smallholders to markets and integrating nutrition into its business model, including by offering organic products to consumers, among which canned indigenous African grains and pulses such as lablab beans, which are highly nutritious and drought resistant<sup>14</sup>.

The collaboration between Bioversity International, the **Busia County** government, and local NGOs such as SINGI, has developed markets and value chains for Indigenous vegetables by using them in school-feeding programmes, resulting in better crop diversity in both diets and production systems. Drawing also on the experience of such two successful cases, and based on the international research project Sustainable Agri-food Systems Strategies, an even broader multi-stakeholder effort is ongoing in Nakuru county to discuss and address many of the above-mentioned Indigenous Vegetable Value chain obstacles. An embryonic form of the “**Nakuru Indigenous Vegetable Multi-Stakeholder platform**” was launched in February 2020 to regularly bring together all the Indigenous Vegetable actors, build trust, coordinate action on Indigenous Vegetable production, processing, distribution, consumption and monitor the development impact. The multi-stakeholder platform will oversee a package of interventions to improve market access (with a focus on public procurement), value addition, and seed systems for Indigenous vegetables, and is also meant to improve the transparency of information along the Value chain and clarify market opportunities for investors, as a solution to improve the local enabling environment needed for finance to flow to the Indigenous Vegetable Value chain.

The AgrInvest-Food Systems project will further map this type of existing and **potential drivers of change in specific parts of the Indigenous Vegetable Value chain that could become AgrInvest-Food Systems partners** (from both the public and private sectors), as the local “champions” to be supported in their possible leadership role within multi-stakeholder arrangements to solve the various bottlenecks in the Value chain.

### 3.2.2 Aquaculture

Kenya's **fisheries sector plays an important role in the country's economic and social development**, albeit well below its potential (Republic of Kenya, 2019). It includes aquaculture (farmed fish) and the capture fisheries, with the latter playing a much larger role to date in Kenyan fish production systems, although aquaculture has been recently making a substantial contribution as well (Figure 8).

This section deals with aquaculture, given its great potential for the SDG Agenda and its relative neglect until now in terms of the policy and investment processes in Kenya. In particular, **inland aquaculture** is discussed here, given the proposed territorial focus for the AgrInvest-Food Systems project (the areas in Kenya with high suitability for aquaculture are mostly located centrally and to the west, in addition to the coastal area: Opiyo *et al.*, 2018); and that more than 90 percent of total annual fish production in Kenya has traditionally come from Lake Victoria (FAO). The most farmed fish in Kenya is the Nile tilapia (75 percent) and the African catfish (18 percent; Opiyo *et al.*, 2018).

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<sup>14</sup> The lablab bean (locally referred to as Njahi) is a multipurpose crop grown as a pulse, vegetable and forage. Until recent years, this was a neglected pulse which is now attracting a lot of attention due to its tolerance of drought.



**Sustainably managed aquaculture can contribute to several SDGs**, mainly SDG 1 (No poverty, by increasing incomes), SDG 2 (Zero hunger, given the excellent nutritional profile of fish), SDG 14 (Life below water, by reducing overfishing), and SDG 8 (Inclusive economic growth, given the potential for small-scale aquaculture operations) (FAO, 2017).

#### **Relevance to sustainability objectives**

This subsection, based on the existing literature and our recent interviews, shows that aquaculture already contributes to positive and sustainable food system outcomes, from the environmental, social and economic perspective, but the potential is much bigger.

#### **Social sustainability and further potential**

Aquaculture in Kenya, 95 percent of which is estimated to be on a small scale (Munguti *et al.*, 2014), currently **contributes to social sustainability as it sustains the livelihoods of many rural poor** in several parts of Kenya (WUR 2017). The potential to further support social sustainability within the food system, however, is much more substantial, especially in terms of nutritional outcomes.

Fish production to support food security and nutritional needs has been underappreciated in Kenya. Fish is a **rich source of micronutrients, vitamins, minerals, fatty acids and high-quality protein**. Common carp, for instance, has more zinc, calcium and iron than poultry and most plant sources (Republic of Kenya, 2019). Kenyans, however, consume less than 5 kg per person per year of fish, below the world's average of 20 kg (Opiyo *et al.*, 2018), and despite its potential being "great" (FAO, 2016), or "enormous" (Munguti *et al.*, 2014), aquaculture produces less than 1 percent of Kenya's protein needs. In this context, and against a background of population growth and dwindling ocean fisheries, strengthening the aquaculture value chain could be a game-changer as a healthy source of protein in the country.

Aquaculture also has significant **potential for gender empowerment** in Kenya, but it currently suffers from gendered obstacles that hamper the full involvement of women. For example, while most traders are reportedly women, they face societal barriers in owning land, which is an important asset in aquaculture. Research around the whole of Lake Victoria found only 16 percent of fishing cages owned by women in 2017 (Njiru *et al.*, 2019). Often, women do the work but the husbands claim the payment.

#### **Environmental sustainability**

In Kenya, the **current use of chemicals** and drugs for intensive tilapia and catfish production that can be detrimental to aquatic life (when poorly disposed of) **is believed to be very low** (WUR 2017). However, with the growth of aquaculture, increased use of chemicals and intensive farming could lead to high nutrient loads and pollution in the water from fertilisers and feed.

Expanded cage farming in Lake Victoria – one of the largest inland fisheries in Africa – can contribute to excessive nutrient load in water and is a new emerging threat to fish biodiversity as they impact the breeding grounds of endemic fish species (Sayer *et al.*, 2018). Sewage water, moreover, feeds into the lake and pollutes the fisheries. In summary, the **environmental management of aquaculture operations is still underdeveloped**.

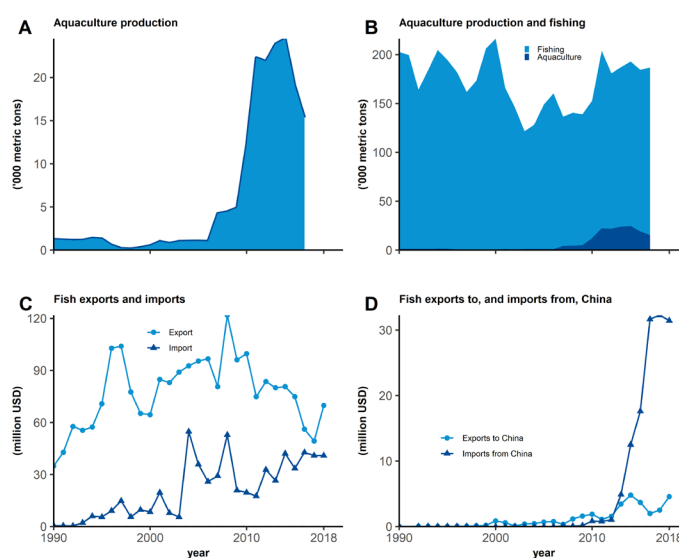
**More sustainable aquaculture might include:** mangrove and wetland conservation, effective effluent management and water quality control, soil and water conservation, responsible sourcing of broodstock and juvenile fish, control of escapes and minimizing biodiversity and wildlife impacts, establishing well-defined property and usage rights, regulatory compliance and effective enforcement, community involvement,

effective biosecurity and disease control systems, minimal antibiotic and pharmaceutical use, microbial sanitation, maintaining global standards for hygiene, accountable record-keeping and traceability (World Bank, 2014).

### **Economic sustainability and commercial potential**

Currently, the aquaculture value chain in Kenya is relatively sustainable from an economic point of view as **it creates increasing jobs and incomes**. Estimates suggest that the fisheries sector has created direct incomes for ~0.5 million Kenyans and earned KES 7 billion for exports, with aquaculture

**Figure 8** Selected aquaculture statistics for Kenya, 1990-2018



Data by World Bank (2020) and Open Trade Statistics / Visualisation by Koen Dekeyser

accounting for more than 50 percent of direct employment despite providing less than 25 percent of total fish production (Republic of Kenya, 2019). Incomes for fish farmers are relatively good, with a high value product considering the limited land size needed. The marketing chain is short, thus reducing the share of product value going to intermediaries, with farmed fish prices being lower on average than those of captured fisheries, hence beating the competition (WUR, 2017).

However, **low production and consumption levels are currently limiting the economic role** within the food system of this value chain, which has a great potential for growth. Aquaculture production in Kenya peaked in 2014, with nearly 25 000 tonnes, but then declined, despite an increase in demand and in the country's per capita consumption of fish. Production was 15 000 tonnes in 2016, with only 0.014 percent of the part of the country that is potentially suitable for aquaculture used for that purpose (Munguti *et al.*, 2014).

It is likely that, given Kenya's growing population and overfished coastal areas, **further fish consumption increases come from either aquaculture or imports**. In 2018, Kenya had a positive trade balance of almost \$29 million in fish products, mainly due to high-value fish exports to the European Union. While there is a positive trade balance, Kenya has a consumption deficit of 800,000 tonnes which it fills with

imports (Andae, 2018). The cost of fish production in Kenya is still relatively high and imported fish is significantly cheaper. Fish imports from China for instance have risen thirtyfold between 2012 and 2018 (Figure 8), prompting complaints from Kenyan producers (Mutheu, 2018). Since the majority of Kenyan consumers are low-income, local fish farmers have been forced to explore other markets, mostly high-end hotels that can afford to pay a premium for high quality products (The Fish Site, 2020).

At the time of writing, there were reports of a collapse in consumer demand for Chinese imported fish **following the COVID-19 pandemic** due to fears of transmission. While Kenyan fishermen enjoyed higher prices, domestic production in the short term is unable to satisfy that supply-demand gap (Reuters, 2020), with transport networks probably unable to respond to increased demand for Kenyan-produced fish. Consumer demand can change as well, with certain sectors – such as tourism or schools – closed, and an economic slowdown due to COVID-19 can depress the incomes of households and decrease an already low fish consumption.

On the other hand, and also depending on the evolution of the pandemic, the **longer-term commercial potential of Kenyan aquaculture** to produce fish sustainably to satisfy a structurally growing domestic consumption remains important. This improves the prospective for return on investment in the value chain, and includes: medium- to large-scale investors recently embracing hatcheries (with innovations also taking place, like recirculatory aquaculture); several aqua parks providing affordable aquaculture products and services, including to youth (so they can lease cages and ponds on land); and urban and peri-urban aquaculture (very small today but deemed by some interviewed stakeholders as “the next big thing”).



Photo 4. Omena fish porridge mixed with amaranth and pumpkin, Nairobi supermarket

Finally, **processing and product diversification** within aquaculture can be a significant driver for the future of this sector. Despite currently taking place nearly exclusively for Nile perch for export, processing holds great potential for future value addition in this chain also for the domestic market. There is already some dynamism among Kenyan SMEs in developing by-products from farmed fish, including to increase the nutritional profile of the products (for instance, fish porridge with amaranth as in the picture below). Given the current policies of the GoK and counties in favour of food fortification, and considering that Indigenous vegetables like amaranth are the other Value chains proposed here, this is a particularly interesting opportunity to explore also for the AgrInvest-Food Systems project.

#### Political feasibility and traction

In general, policymakers, public authorities, private investors, civil society and development partners in Kenya have not prioritized aquaculture. However, the **political feasibility and traction to support this value chain are clearly picking up**, given the increasing market demand and the recent initiatives by the national and county governments, NGOs and international partners, as well as other political economy dynamics.

In 2007 the GoK started to support fish farming as a source of food and means to create employment and income in rural areas for the first time, with the **Economic Stimulus Programme** (2009-2012) providing subsidies for the construction of fishponds, and the purchase of fingerlings and fish feed (IFOAM). This resulted in the fourfold to sixfold growth of freshwater aquaculture production between

2006 and 2014 (Republic of Kenya 2019). Further support came with the launch of the GoK's 2008-11 Fish Farming Enterprise Productivity Program, aimed at 28,000 fish ponds in 160 constituencies (FAO, 2016). The programme's success is visible in the more than double size of fish pond areas between 2008 and 2009 (Opiyo *et al.*, 2018).

This public support for the value chain was partly slowed down by Kenya's devolution as certain counties, which became responsible for aquaculture, pulled back. This created a **distinction between counties high in aquaculture activities, and the rest** (public involvement in aquaculture business development projects is still active in 12 counties). In comparison with maize, seen as a "political" crop, no active involvement of the leading elites is noted in the aquaculture value chain. Finally, in the latest reorganization of government functions, aquaculture is now one of the four core functions of the Fisheries State Department within the MOALF. The Kenya Fish Marketing Authority, created in 2016, is another important organization under the MOALF.

In terms of **private sector traction**, the aquaculture sector recently organized itself in the Commercial Aquaculture Society of Kenya, while fish export is organized by the Kenya Fish Processors and Exporters Association. These associations can translate the sector's specific needs to the different levels of government, and reflect the increasing interest in aquaculture among entrepreneurs and investors.

Recent **international partners' initiatives** to support aquaculture also indicate growing traction. These include the Aquaculture Business Development Programme with a USD 130 million financing loan from the International Fund for Agricultural Development in May 2020 to the Kenyan government, targeting over 35,500 households to raise fish consumption to 10 kg per capita by 2030 (Food Business Africa, 2020). The programme includes support to: county-level extension service provision and the establishment of Mini-fish Processing Plants and Aquaculture Business Hubs; smallholder aquaculture farmers to acquire inputs and the rehabilitation/construction of production units; capacity building for aquaculture value-chain players; and creating structured markets and institutions for the value chain.

Finally, also the **recent interviews and consultations** conducted under the AgrInvest-Food Systems Project **confirmed** both private sector interest (banks and development finance institutions) and growing public sector appetite, including by making the most of synergies between aquaculture and agriculture. Through integrated farming, such as producing fish in rice paddies, synergies can be created in existing agricultural operations.

### **Value chain bottlenecks, solutions, and possible champions**

Aquaculture suffers from a very **weak regulatory environment**. Especially around common resources, such as Lake Victoria, this leads to environmental degradation: "*Cage fish farming urgently requires formal guidance and appropriate legislation if it is to be socially, economically and environmentally sustainable*" (Sayer *et al.*, 2018, p. 143). Without proper management, it may turn into a disaster (Njiru *et al.*, 2019). Attempts by the State Department For Fisheries, Aquaculture And The Blue Economy to regulate cage farming in Lake Victoria was successfully adhered to by the big producers, but not by the small ones. Without proper regulation, cage farming might continue to expand and could lead to conflict (Njiru *et al.*, 2019).

Kenya's aquaculture sector is hampered by **high costs** (no subsidies on major inputs and expensive transportation), **lack of investment** (production systems are quite capital intensive) **and limited knowledge**, resulting in more extensive but less intensive systems. Its input systems hamper further expansion, as fish feed and quality fingerlings in Kenya are particularly expensive. **Further challenges** include a "*lack of a comprehensive aquaculture policy, poor extension services, lack of robust need-based*

*research coupled with low funding, lack of investment by the private sector, and unfocused promotion of aquaculture through many institutions” (Munguti et al., 2014, p. 8). Particularly technical knowledge and process management are lacking in aquaculture (Elmer & West, 2018). SMEs are too big for micro-financing and too small for commercial lending (FAO & GAIN, 2018). All this is compounded, according to the interviews conducted for the AgrInvest-Food Systems project, by the lack of cold storage facilities that often forces fishermen to sell within a short time at “non-fair” prices (partly manipulated by the middleman).*

“There are diversified opportunities for the aquaculture value chain actors to access finance depending on their nature and needs, from Banks, microfinance institutions, Savings and Credit Cooperative Societies (SACCOs) or impact investment funds” (IFAD, 2017: 23). However, **credit lines to aquaculture are very limited** as the sector is regarded as high risk – in part due to the sector’s immaturity (FAO, 2014) – despite its commercial potential. A 2014 FAO study into Kenya’s aquaculture summed up the sectors’ finance needs as: a) tailored credit offered to suit aquaculture farmers and to lower interest rates; b) cooperatives should be formed and members should purchase shares to access credit (FAO, 2014). Currently, the Fisheries State Department is engaging financial institutions to provide innovative financial packages to aquaculture producers, like those existing for agricultural producers, which take into account their growing cycles (FAO, 2014) Compared with agriculture, aquaculture requires more resources for its set-up, such as technologies. The Agricultural Finance Corporation started providing loans adapted to the specificities of the Kenyan aquaculture sector. Indeed, the sector is organized into various groups, which enables small producers to be grouped for credit applications, but these groups can be strengthened as regards their business acumen (FAO 2014). Other instruments under development are aquaculture insurance schemes, or special loan arrangements in support of nutritious value chains. Initially, public procurement contracts can guarantee demand that then help groups to access private loans.

A more detailed mapping of stakeholders is needed but **possible champions** (partly already contributing to these possible solutions) **include**: the dedicated small-scale and large-scale fish farmers; groups like FoodTechAfrica, Farm Africa/KMAP, the Aquaculture Association of Kenya; MOALF, Kenya Fish Marketing Authority, and the State Department of Fisheries; the counties committed to strengthen this value chain; and research institutes such as the Kenya Marine and Fisheries Research Institute and the National Aquaculture Development and Training Centre (in charge of practical research and development projects and capacity building for fish farmers). Besides the more traditional channels, e-commerce advertised through social media is emerging as a new channel of distribution for fish as well (Nairobi News, 2018).

## 4 Concluding remarks

This study mapped Kenya's food system, outlining in broad terms its social, environmental, economic outcomes and drivers, as well as its key actors, political economy features and sustainability challenges and opportunities. The analysis **provides information to guide the interventions under the FAO AgrInvest-Food Systems project**, which aims to help stakeholders understand and manage the complex choices around food system sustainability and resilience, and more specifically assists in promoting sustainable investments in food value chains through a politically informed food system approach.

With a view both to narrowing down the complexity involved in Kenya's food system and increasing the chances of successfully contributing to its improvement, this analysis proposes the adoption of **a value chain and a territorial focus for AgrInvest-Food Systems, based on the possible pathways for strengthening sustainability** that emerged from this analysis. **Indigenous vegetables and aquaculture** were identified as **strengthening these value chains, which could provide opportunities to simultaneously**: contribute to healthier and diversified diets, women's empowerment, agro-biodiversity protection, better smallholder's income opportunities, production diversification and climate-resilience; build upon increasing national demand, high potential for processing and synergies with other value chains, as well as growing traction and multi-stakeholder initiatives; while targeting sectors that are currently neglected by policies, research and partnerships.

The study suggests putting at the centre of the AgrInvest Food Systems project **the territories from the National Capital to Lake Victoria** (with Nairobi, Nakuru, and Kisumu as principal urban centres) **both as major production areas and markets to be targeted** by such value chain improvements, for various reasons, including: their current levels of production of indigenous vegetables and aquaculture, and the potential to produce much more; the large population that would directly benefit from the related economic and food system improvements; these territories constitute a well-connected continuum of market access and broader spatial development opportunities, and currently host significant multi-stakeholder efforts.

Such a proposal with a value chain and territorial focus hopes to capture these emerging opportunities and to **address, indeed, some of the worrying trends within Kenya's food system** identified through our analysis. Not only has undernourishment been rising for a number of years, but overweight and unhealthy diets are increasing, with signs of unsustainable natural resources depletion as well. Investments and policies could therefore be reoriented to **support nutrition-sensitive value chains** such as indigenous vegetables and aquaculture, for more sustainable production and diversification, assisting instead of neglecting informal livelihoods, and inclusive governance. The trajectory of Kenya's food system could also be improved to benefit human health, the environment, and the economy simultaneously, by rebalancing national and international support for **the food economy to better serve the national and local markets**, as proposed here for territories from the National Capital to Lake Victoria, and not only global value chains. Dependence on the global food system and Kenya's general export-orientation are leading knowledge systems, financial markets, policies and investments to implicitly and explicitly encourage monocropping, more unhealthy diets, and business concentration, with likely negative environmental, social and economic consequences for the majority of the population.

This attention to exploring opportunities to **strengthen short value chains for fresh and nutritious products is particularly relevant considering the current pandemic**. Many of these products have

become more expensive and harder to source due to the lockdown measures, market restrictions and food safety implications linked with COVID-19, at global and national level. Ensuring that these types of value chains effectively connect rural and urban areas can contribute to healthier local diets and stronger immune systems, and to making food supply chains more resilient to external shocks.

While for the two value chains of focus this study has already outlined the main sustainability, commercial and political traction opportunities and challenges, and the main investment bottlenecks, **the AgrInvest-Food Systems project** will further investigate the factors that are currently limiting investments specifically in indigenous vegetables and aquaculture. Significant resources currently flow into the Kenyan food system, primarily to acquire assets or equity shares, from smallholders using their savings, small and medium-sized companies attempting to increase their profits, and large agribusinesses conquering new markets. In general, however, the perceived high risk in the agriculture and food sector, supply side constraints, and institutional weaknesses, hinder investments at the scale that would be necessary to transform the food economy and, in particular, limit credit for small players that would be essential to allow thousands of informal actors to become successful entrepreneurs. The project will address these crosscutting issues and in particular the inability of financial institutions and private investors to assess profitable opportunities in the indigenous vegetable and aquaculture value chains, thus identifying options for future investments that improve social and environmental sustainability, together with economic rates of return, within the food system.

**The existing and potential “drivers of change”** in the proposed territories and value chains **will be further mapped to establish potential partnerships with the project**. These potential local ‘champions’ could be assisted enabling them to perform leadership roles within multi-stakeholder arrangements to solve the Value chain bottlenecks identified. These local champions will also be connected to broader multi-stakeholder dynamics and initiatives working towards more sustainable food systems in Kenya, to achieve impact at scale, avoid duplication of efforts and **synergize** the initiatives on indigenous vegetables and aquaculture **with broader ongoing food system diversification efforts**. Example of such broader initiatives include the FAO’s “Nadhali” project in Nairobi and Kisumu, linking for instance – in a territorial development sense – these two large cities and their overall food system strategies and multi-stakeholder platforms (including their efforts to source more nutritious food like indigenous vegetables via shorter value chains) with their respective neighbouring counties like Nakuru and Vihiga.

Such synergies between large production areas, mostly rural, with urban growing markets, facilitated by the commitment of the county governments, private sector and other actors involved, constitute an important building block for the future activities of the AgrInvest-Food Systems project, targeting value chain improvements **along a possible future “indigenous vegetables and aquaculture corridor”** from the National Capital to Lake Victoria. This would allow the project, aimed at supporting local and national development strategies, to contribute to the **ongoing bottom-up efforts to promote a transition**: from an economic growth model largely based on export-oriented agriculture and large farms to a more sustainable development approach, based on an innovative food economy with smallholder agriculture, differentiated production and diets, improved distribution systems and value addition as well as with Kenyan markets at its core.

Whether this can happen will depend on the associated social and environmental challenges and especially on the economic costs and opportunities, hence the incentives (including the ability to attract investments), that key food system stakeholders will face in the future. The next steps of the AgrInvest-Food Systems project will therefore include<sup>15</sup>:

- further analysis of the constraints on private investment, resilience and sustainability within the above-mentioned “indigenous vegetables and aquaculture corridor”, and detailed mapping of the relevant stakeholders and initiatives;
- support to establish or strengthen inclusive multi-stakeholder frameworks to coordinate policies and investments to remove such constraints;
- recommendations on how to leverage SDG-compliant private investments by defining together with local stakeholders: what constitutes better resilience and economic, social and environmental sustainability in the specific value chains and territories; and the necessary policy measures and (blending) financial instruments required to promote greater sustainable private investment there efforts to integrate the impact and broader local responses to the current pandemic into these
- analyses and activities.

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<sup>15</sup> More information and updates of the AgriInvest-Food Systems project at <http://www.fao.org/in-action/agriinvest-food-systems>



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**AgrInvest-Food Systems Project**

# **Political economy analysis of the Kenyan food systems**

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**Key political economy factors and promising value  
chains to improve food system sustainability**

This publication is realized under the AgrInvest-Food Systems project. It analyses Kenya's national food system through a food systems and political economy approach. Furthermore, the study identifies various bottlenecks that are currently impeding more investments in agri-food systems in Kenya, as well as two promising value chains that could be supported with public and private investments aligned with the Sustainable Development Goals (SDGs).

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