Chapter 19

A WAY FORWARD: POLICY-DRIVEN TRANSFORMATION

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This book has adopted a food systems framework as a new way of conceptualizing and designing food policies and research. Looking beyond agriculture and value chains makes it possible not only to turn food systems into a driver of economic transformation but also to better include health, productivity, resilience, inclusivity, and sustainability as integral parts of system transformation.

Such a fresh approach is urgently needed in light of limited development progress over the past years in Kenya and other countries. The share of manufacturing—traditionally a driver of economic transformation—in total output remains low; maize yields have been stagnating for the past 20 years; and poverty and food insecurity are on the rise again (Nafula et al. 2020; FAOSTAT 2022). In addition to structural challenges, growing challenges and vulnerabilities such as the threat of pandemics, commodity price crises, climate change, and conflicts, call for a new development and food policy paradigm (Breisinger et al. 2022; UNICEF 2022). At the same time, such a fresh approach can also help in harnessing the new opportunities that come with digitalization and with (policy) lessons from other countries that can be adapted to the Kenyan context.

The remainder of this concluding chapter offers several broader lessons for food systems research and then provides five sets of policy recommendations (one for each of the five dimensions: productivity, resilience, sustainability, health, and inclusivity) for Kenya. It concludes with a call to revisit existing development paradigms in order to truly transform food systems and development.

Lessons for food system transformation

One of the broader lessons emerging from this book is that **countries should be more selective when designing development projects and focus more strongly on strengthening national institutions.** All contexts are different, and every country will have to find its own pathway to food system transformation. One-size-fit-all policies overlook the complexity and nuance of national food systems, whereas, as a general principle, coordinated development and implementation of sound policy are at the core of food system transformation.

Kenya has in place an institutional framework that provides an enabling environment for food system transformation, bringing together key actors in the food system. One key actor is the Ministry of Agriculture, Livestock, Fisheries, and Cooperatives and specifically the Agriculture Transformation Office, tasked with coordinating the Agricultural Sector Transformation and Growth Strategy through performance management, spearheading intergovernmental actions, and guiding data and digitalization efforts (Kenya, Ministry of Agriculture, Livestock, Fisheries, and Cooperatives 2022).

Meanwhile, to support Kenya's agriculture and food sectors, the international community is organized into the Development Partner Group for Agriculture and Rural Development. These and other platforms are important for more coordinated collaboration between the government and development partners, especially given that an estimated 83 percent of funding for agriculture comes from the latter and only 17 percent from the former (Kenya Parliamentary Budget Office 2021). Over time, funding a higher share of agricultural spending from domestic sources is likely to build more ownership and sustainability. A more selective role of the government when designing development projects and a stronger focus on strengthening governmental institutions is also likely to improve longer-term development outcomes.

Research can play an important role in food system transformation. In Kenya, more efforts need to be made to better link national research institutes and universities with international research entities. Too often, research efforts are conducted in parallel, and results are not well communicated to policymakers and decision-makers. This can lead to missed opportunities and even confusion. For example, two different panel surveys exist for maize, one conducted by the Kenya Agricultural and Livestock Research Organization (KALRO) and the other by the International Maize and Wheat Improvement Center (CIMMYT). The data from KALRO suggest some improvements in maize yields in Kenya; results from the other survey suggest stagnation (see Chapters 7 and 8). More efforts are needed to increase the coordination and

coherence among international research institutes and between international and national research institutes.

Collaboration between national and international researchers can lead to more relevant, rigorous, and coherent research. Peer-reviewed journal publications influence the direction of academic work and help shape policy objectives and design. Authors based in Northern countries write an estimated 75 percent of publications in peer-reviewed development journals (Amarante and Zurbrigg 2020). Not all, but some, of the Northern-based research in top development journals is characterized by rigorous methodology and/or theory but lacks context and relevance to study areas and national policies. Collaboration with in-country researchers is needed to overcome these barriers. Linking national and international researchers should take the form not of capacity building but rather of *capacity sharing* with national researchers, to enhance the contextual relevance and depth of research and contribute expertise in publishing in top development journals. This book is an example of bringing researchers together to create rigorous and relevant research in a cohesive form for national policymakers.

A second broader lesson is the importance of **encouraging a stronger focus on coherent policy design and effective implementation.** Sound policy development requires coherence in policy within food systems, across related areas of the economy and in conjunction with international policy, as called for in the 2014 Malabo Declaration (AUC 2014). Coherence of policies relies on addressing the complex web of interactions within food systems. Because changes in one area of a food system affect other areas, each specific policy must build synergies with other policies to reach the overall food system objectives. For example, policies affecting food supply chains must take into account the resulting effects on the food environment and consumer behavior. Further, policies in other sectors should align with food sector development, such that related policies do not undercut food system goals. Policies across international organizations and the national government should also be coherent, with national governments taking the lead in setting objectives (Chevallier 2022).

Without effective implementation, even well-designed policies will fail to meet their goals. Effective implementation requires government bodies to have the capacity to meet policy objectives and the needs of food system actors. This will require increases in efficiency at the national level and quality control of services offered by counties. Further, private–public partnerships can be leveraged to assist public institutions to reach the scale needed for food system transformation. For example, the draft bill of the Kenyan Agricultural Sector Extension Policy places private–public partnerships at its core to revive

the extension system (Kenya, Ministry of Agriculture, Livestock, Fisheries, and Cooperatives 2022). However, concerns about inclusion and trust should be noted, as policy implementation must reach actors across different value chains—not just "priority value chains"—and all groups, particularly women and other marginalized actors. Especially when leveraging private–public partnerships, building trust within the food system is necessary to ensure actors buy into policy implementation.

A third broader lesson is the need to **harness the power of knowledge by strengthening the science–policy interface (SPI).** Policy development and implementation should rely on evidence shared through a robust SPI. An effective SPI must meet at least three criteria. First, it must leverage research to support the development and implementation of coherent, data-driven policies to achieve food system outcomes. Second, such research should be transparent, independent, and rigorous. Third, research agendas must be aligned with policy to produce relevant findings (Singh et al. 2021). Drawing on experience from previous agricultural value chain transformations, which relied heavily on strong SPIs, an additional criterion must be met: research must be on the ground and in touch with food system actors' needs. This means opening flexible communication channels between researchers, food system actors, and policymakers (Roseboom and Rutten 1998). Incentives for researchers may also need to be based on the practical, rather than academic, relevance of their research (Abraham et al. 2019). The Kenyan SPI can leverage national research institutes and universities and international research institutes by aligning research objectives to national policy and developing synergies through collaboration between the various institutes. Bridging the science–policy gap will also require more timely provision of research-based evidence when decision-makers need it and in a form that is digestible for them.

As an example of how to address these issues, the CGIAR Research Initiative on National Policies and Strategies[1] is currently in the process of co-creating an SPI in the form of a Community of Policy Practice in Kenya and other countries. These Communities of Policy Practice can also play an important role in bringing national and international policy researchers together.

1 www.cgiar.org/initiative/27-national-policies-and-strategies-for-food-land-and-water-systems-transformation/

Policy recommendations for food system transformation in Kenya

Kenya is well placed to foster transformation in the food system. At the UN Food Systems Summit in 2021, Kenya provided a blueprint for transformation of food systems, with a strong focus on climate resilience, investments in key sectors, and enhancing the role of women and youth in food systems. Kenya is already the regional leader in digital agriculture innovation, with 30 percent of all disruptive agricultural technologies in sub-Saharan Africa based in Kenya (Kim et al. 2020). It has implemented enabling policy frameworks and business environments in recent years (Kenya, Ministry of East African Community and Regional Development 2020) and is endowed with immense agricultural potential and diversity. Further, a youthful and enterprising population—if enabled—can drive innovation and help secure nutritious, productive, resilient, sustainable, and inclusive food systems (FAO 2019). As in other countries that have undergone radical transformation (albeit in agricultural value chains rather than entire food systems), enlightened, aligned, and ambitious public policy is the key ingredient for success (Abraham et al. 2019).

In the following, we summarize the key policy recommendations emerging from this book, organized along the main food system dimensions of health, productivity, resilience, inclusivity, and sustainability.

Health: Invest more in nutrition education and create smart regulation for food safety without overburdening businesses

Transforming Kenya's current food system for better nutrition and health will require a paradigm shift that puts consumer diets at the center of policymaking. As agriculture is by far the dominant sector in Kenya's food system, such a shift will entail striking a balance between traditional objectives like agricultural productivity growth, export stimulation, and farmer support, on the one hand, and the new responsibility for better nutrition and health for all Kenyans, on the other.

As Chapter 4 analyzes, malnutrition in Kenya is primarily a poverty problem. In addition to policies that lead to rising incomes, reducing relative food prices through demand-side policies (for example, targeted consumer subsidies) or supply-side policies (for example, targeted farm input subsidies or development of improved farm technologies) may be effective at narrowing the consumption gaps for nutritious foods. Weak consumer preferences and high price sensitivity may be an indication of a lack of consumer knowledge of the nutritional value

of pulses, nuts, and seeds. Nutrition education, for example, in schools and through public information campaigns, may aid in changing consumer behavior.

As Chapter 3 shows, there is broad scope for improving animal health, feed standards, and breeds. For example, the government needs to strengthen the veterinary laboratory system to provide technical support for disease surveillance, diagnosis, and quality control. There is also a need for joint engagement of the State Department of Livestock and the Zoonotic Disease Unit under the Ministry of Health in controlling zoonotic diseases within the One Health Concept. It is also important to establish mechanisms for public and private partnership for controlling cross-county and transboundary infectious diseases and to coordinate with the Kenya Wildlife Service for the control of diseases at the livestock–wildlife interface.

Food safety is an important area for policy action. Chapter 5 outlines important actions to improve food safety, such as monitoring of water sources used for irrigation, and to remediate problems; providing water, sanitation, and hygiene infrastructure at markets and abattoirs; building capacity and incentivizing food safety among small-scale, informal businesses; implementing regular and comprehensive surveillance of high-risk foods; leveraging private sector capacity for self-monitoring under a coregulatory approach; and including food safety in infant and young child feeding recommendations for caregivers.

Productivity: Play a supporting role for the private sector to accelerate the transformation of input markets, food processing and service sectors, and mechanization efforts

As Chapter 2 shows, Kenya's food system is, as a whole, still in an early stage of transformation, with most growth and job creation occurring close to the farm. Successful transformation in Kenya requires even larger contributions from agro-processing and food services, with more value addition and jobs in the food system eventually generated off the farm. The value chains that are found to be the most effective in reducing poverty, creating jobs, and improving diets are also the ones that make up a large share of Kenya's current agriculture sector. This includes value chains producing animal products and traditional export crops. The value chains that are found to be least effective, such as cereals and root crops, often dominate agricultural landholding and account for a large share of public investments. Acceleration of structural changes within the food system through reorientation of the government's investment portfolio could enhance the contribution of the food system to broad development outcomes.

Chapters 2 and 8 argue that there is also a need for nonagricultural growth and economic transformation to absorb farmers in nonagricultural labor

markets. For this, a set of policies is needed that includes measures to support the emerging commercial farmers who are expected to foster labor productivity growth, wage labor income, and integration in retail value chains toward domestic and export markets. Also relevant are policies and investments to shape the development of the industrial structure of the food and agriculture sector and the links at different levels of the value chain (Neven et al. 2009 on horticulture and supermarkets in Kenya; Lowder, Skoet, and Raney 2016). A third relevant policy area covers policies and institutions to facilitate the movement of labor out of agriculture and into nonagricultural sectors in this process. This further requires the private sector-led creation of rural and urban jobs in industry and services to move along hand-in-hand with agriculture and other forms of social protection such as social safety nets.

As an example of the discussion around supporting industrial development, Chapter 9 on mechanization argues that the development of local industry to manufacture machinery, implements, and equipment remains a feasible option—and it is happening, as in the case of Ndume Ltd., located in Gilgil, Kenya. A promising starting point is support to the development of a spare parts industry. Outside Kenya, while experiences in promoting local assembly have been mixed, some plants, like Ethiopia's Nazareth Tractor Assembly Plant, have remained operational for many years, providing almost half of tractors entering the country between 2005 and 2010 (Takeshima, Diao, and Aboagye 2020). Applied research in mechanization needs to enable the fast-tracking of progress made, through establishing more stable macroeconomic environments, liberalized markets, tighter fiscal regimes, and stronger institutional frameworks.

In addition to promoting industries, improving marketing systems is important in driving transformation. Chapter 3 highlights that unstructured marketing systems have a negative impact on industry, leading to its underperformance, using livestock as an example. There is a need to strengthen the capacities of producers and marketing groups in the production, processing, and storage of livestock products. As stated in Kenya's livestock policy, it is important to facilitate the dissemination of livestock marketing information to all value chain actors and to establish mechanisms for strengthening and harmonizing market information systems and developing linkages with local and international markets. Chapter 8 shows that, while agricultural input markets in Kenya are largely liberalized, the supply of the inputs is sometimes unreliable and the distribution networks are inefficient—hence supply is not in sync with demand, either temporally or spatially. Digitalization may play an important role in improving market information and efficiency, as discussed in Chapter 18.

Increasing agricultural productivity sustainably remains a priority. Chapter 9 argues that the government can strengthen support to farmers' training on machine operation, maintenance, and repair, to enhance efficiency and reduce the costs of service provision, as has been experienced in Ghana. These trainings can be provided in technical and vocational education and training institutes, universities, and research institutes, in particular the Agricultural Mechanization Training Institute.

In doing so, it is important to incorporate the knowledge of existing private sector hiring service providers, who often have experiences and expertise specific to their local business environment. In addition, machine hiring services should be promoted, including through value chain financing. Property rights and law need to be reviewed to enable more land rental activity, which has been shown in other countries to improve resource allocation and productivity. Integrating formal and informal seed systems, promoting better input management practices, and reducing input costs are critical areas for fostering agricultural growth. Reducing input costs will require investments in road infrastructure and nontariff barriers (for example, roadblocks).

Resilience: Develop policies to foster agricultural diversification and de-risk credit and insurance

An important element in building resilience to crisis is diversification. As Chapter 10 discusses, building a sustainable, resilient food system in a country such as Kenya requires a fundamentally different model of agriculture based on diversifying farms and farming landscapes, optimizing biodiversity, and stimulating interactions between different sectors for a sustainable healthy diet for all. Together, a varied and balanced diet, a wide range of crops and foodstuffs, and a diverse system of production and distribution make for a more resilient, stable, and healthier food system (EC 2020).

The ongoing global commodity price crisis highlights how Kenya relies on imports to meet its food, fertilizer, and energy needs—and there is considerable instability in fertilizer world prices. Therefore, Chapter 8 (on inputs) argues for expanding and diversifying private sector trade. A diversification of diets with a higher content of domestically grown crops and livestock could not only reduce imports but also improve diet quality and increase domestic producers' income (Chapter 4). Likewise a stronger focus on domestic energy sources (for example, expansion of geothermal energy) can provide more energy independence and a boost to domestic industrialization.

Diversification and greater use of domestically grown cereals can be also promoted through flour blending, argues Chapter 16. For this to happen, a

range of potential interventions exist, at various nodes of the food system. These include addressing limited access to quality seeds of target crops, reorienting the current extension system to include and serve these crops, building capacity of aggregation systems and farmer producer organizations for collective action, locating processors near high-production areas of target crops, and promoting the crops to create demand through consumer campaigns and targeting public procurement for blended flour (for example, in schools and hospitals, with the military, and through food aid).

On building resilience at the farmer's level, Chapter 11 (on insurance) highlights how climate insurance is an increasingly important financial instrument to improve agricultural risk management for smallholder farmers, herders, and other value chains actors in the face of the present climate crisis.

Inclusion: Invest in capacity building for youth (particularly in agribusiness), for producers (that is, extension systems), and for women along the value chain, and set up clear contract enforcement mechanisms that protect small farmers

Providing better opportunities for women and youth in food system transformation will make food systems not only more inclusive but also likely more productive, argue Chapters 13 and 14 (on gender and youth). Chapter 13 (gender) argues that *women* play a critical role as both primary food producers and primary household caretakers, and are hence key stakeholders in sustainable and resilient food systems. To strengthen the role of women in food systems, existing challenges such as low land ownership and minimal participation in decision-making and food governance, existing disadvantages in owning/acquiring food production resources, and weaker networks all need to be addressed.

To give *youth* a better chance, structures of support for youth in agribusiness need to be improved to take advantage of the knowledge young farmers and agripreneurs have (Chapter 14). It will be crucial to lend a hand to equip these youth with appropriate agribusiness skills, knowledge, and information and to enhance their access to affordable and youth-friendly growth capital that can enable them to scale up promising agribusiness ventures. The relaunch of the 4K clubs will provide momentum to scale school-based agricultural education in Kenya to inculcate a positive mindset regarding agriculture among young students and to nurture, prepare, and build future leaders in the agriculture sector. In addition, the chapter argues that building youth-led professional networks, facilitating the formation of a national youth in agriculture association, improving the evidence base for youth engagement in food systems, and

supporting youth engagement in the policymaking process are all important elements of successful food system transformation.

Better inclusion of resource-poor farmers in the food system is also important, argues Chapter 15. The authors provide a rationale for subsidies for resource-poor farmers. However, they also highlight the existing challenges that come with fertilizer subsidies in Kenya. While some county governments provide fertilizer subsidies, information about targeting, quantity, pricing, types, and mode of delivery is not publicly available. Lack of access to such information may hinder proper planning by fertilizer market players. This suggests room for improving the targeting of fertilizer subsidies and establishing a better monitoring and evaluation system for doing so.

Good targeting also plays a key role in insurance. For this, it is important to differentiate between different types of farmers and herders, distinguishing at the very least between the poorest farmers, typically landless laborers; the vulnerable non-poor, typically subsistence-oriented farmers; and more commercially oriented smallholder farmers. Each of these groups will require different insurance or social protection solutions (Chapter 11). This will also involve putting social and gender equity at the forefront of impact assessments, to ascertain that, among the most vulnerable segments of the population, insurance programs reach, benefit, and empower women and men alike.

Better access to credit is also a key factor in broadening access to food system activities. Chapter 12 shows that developing policies to hedge smallholders against systemic shocks, such as drought, is one way of enhancing access to credit. The use of formal insurance markets is a viable policy since it transfers the risk outside the household and hence protects its collateral. Bundling insurance with credit also minimizes the risk of default by smallholder borrowers, which reduces lenders' financial risks that threaten their business stability—a common phenomenon when rural agricultural production systems experience systemic shocks such as drought.

To better include smallholders in markets, Chapter 15 finds that contract farming can be a good strategy for individual smallholder growers to access attractive markets and benefit from export opportunities. For this to be successful, there is a need to invest in training on sustainable production, harvesting, and other postharvest management techniques, and on the prevention of theft and illegal cartels that force farmers to harvest fruits early. Creating an enabling environment for mainstreaming contract farming to strengthen agricultural value chains also requires appropriate legal frameworks to facilitate contracting that entails clarity of terms, fairness, responsibility, and transparency. This will build trust in completing transactions between the different parties.

Sustainability: Invest in targeted transportation infrastructure and digital networks and create smart regulations to support off-farm service providers and also adequately protect actors (for example, smart data regulations for the digital ecosystem)

Chapter 18 shows that Kenya has made significant strides in the digital space in terms of improving mobile/internet infrastructure and supportive policies. Kenya's exemplary efforts in addressing the human capital constraints that impede the creation and use of digital innovations in most African countries, through building robust incubation and accelerator centers, are also an important lesson. Promoting digital solutions can be transformative across the whole food system. For example, digital mechanisms can verify the quality of seeds and fertilizers, facilitate the provision of services (for example, the renting of machinery), and enable the marketing of food. However, the authors note that Kenya's progress is still not sufficiently transformative and sustainable, especially in agriculture-focused digital innovations. Replicating some of Kenya's most transformative digital innovations, mainly those that facilitate financial transactions (for example, M-Pesa and M-Shwari), in smallholder agriculture would be an immediate next step. Future efforts should also be accompanied by systematic assessments of both successes and failures at different stages of piloting and scaling of digital solutions.

Open questions and future research directions

Transforming food systems will also require revisiting some of the longstanding development paradigms and debates about agricultural and spatial development. Viewing these paradigms through the lens of the food system framework is useful because the framework can help in assessing the trade-offs between the different outcomes (health, productivity, resilience, inclusivity, and sustainability) (De Brauw et al. 2019). This section discusses some of the most relevant questions for Kenya based on the insights from this book and beyond, before we conclude the book with future research directions.

Should policies and investments be targeted more toward smallholder farmers or promote more larger-scale farming? On the one hand, targeting smallholders promotes inclusion. On the other hand, targeting larger farmers is more likely to improve productivity and even the financial sustainability of development programs. On this question for Kenya, results from Chapter 7 provide inconclusive evidence. The chapter also shows that the policy goal has often been to close the productivity gap between efficient and inefficient sub-counties, suggesting a policy bias toward smallholders. This policy model was imported

to Africa because of the critical acclaim given to the Asian Green Revolution driven by small-scale farms—which is most farms in Africa at present (Hazell 2009). But Chapter 7 argues that, based on significant evidence from the most recent literature, farms between 20 and 70 ha are substantially more productive than farms under 5 ha (Muyanga and Jayne 2019). Results like these are a major challenge to the hypothesis that efficient smallholders are agents of change. Rather than an indication of efficiency, the small size of farms in Kenya could be part of a poverty trap whereby frictions in land markets prevent households from exiting agriculture to the extent that would be efficient (see, for example, Chen 2017; Gottlieb and Grobovšek 2019; and discussion in Gollin, Hansen, and Wingender 2021).

Are some farms becoming too small and should farmers be incentivized to move up or out of agriculture? (Fan 2014). Gollin and colleagues (2021) argue that, with well-functioning markets, it would be expected that the least effective farmers would move out of agriculture into other occupations, either selling or renting their land to farmers who are more skillful. Chapter 7 argues that the fact that this is not happening could imply that Kenya has institutional frictions or rigidities that prevent unproductive farmers from exiting the market (see discussion and references in Gollin, Hansen, and Wingender 2021). The outcome is aggregate inefficiency resulting from the misallocation of labor, land, capital, and managerial effort that creates a consequential drag on aggregate productivity.

Should the government and international partners invest more in Kenya's arid and semiarid lands (ASALs) or more in the more prosperous and fertile regions? Policy involving the ASALs touches on all the food system outcomes. Kenya's ASALs are on the frontline of the climate crisis and need heavy investment to promote climate-smart food systems and build resilience to increasingly volatile conditions. Further, ASALs are often marginalized in national and international development programs in favor of the more prosperous fertile regions, bringing up issues of inclusion. As Chapter 16 argues, strengthening production in the ASALs could also lessen the food system's dependence on maize and provide resilience to maize production shocks. However, investments here carry higher costs because of remoteness, conflict, and harsh conditions. Returns on investments may also be lower because of lack of market access and less favorable production conditions. Policy needs to adequately address these challenges, and research on ASALs should be increased to better inform policymakers.

Should the government simultaneously promote climate-smart agriculture and the increased use of chemical inputs? Chemical fertilizers vastly improve production, and the national government has been promoting their use for decades. But

chemical fertilizers can also contaminate local water sources, and are subject to international price swings. At the heart of this question is a trade-off between increased production and sustainability and resilience. The government runs programs subsidizing chemical fertilizers alongside climate-smart agriculture programs (for example, the Kenya Climate Smart Agriculture Project). The recent drastic increase in natural gas and fertilizer prices is exposing the vulnerability of agricultural input markets to global market swings and making climate-smart agriculture a more appealing long-term alternative. However, policymakers and researchers need to consider how to incorporate climate-smart agriculture into existing policy frameworks to understand how to realize its benefits as a long-term alternative.

Other open questions that policymakers should consider and that require more research are: How can sustainability be built into food system development policies? How can public–private partnerships be leveraged while maintaining trust among food system actors and promoting sustainable business models? What regulations and institutions are needed to ensure that digitization efforts can be carried out while maintaining data privacy? How can national and international research agendas be aligned with evidence gaps in key policy areas? How can county governments be better empowered to foster food system transformation at the local level?

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