CHAPTER 3

Food System Diagnostics and Policy Implications: The Malawi Case

Greenwell Matchaya and Paul Guthiga

Introduction

Food systems are at the heart of Africa's economic growth and development plan, Agenda 2063: The Africa We Want. Without ending hunger and improving the food and nutrition status of Africa's population, the agenda's first aspiration for a "prosperous Africa based on inclusive growth and sustainable development" cannot be effectively reached. To realize this aspiration, African countries need to progressively implement the seven Comprehensive Africa Agriculture Development Program (CAADP) Malabo commitments while having strategies to address wider food system challenges (AU 2023). The concept of a food system has various definitions, but for the purposes of this chapter, a food system is considered as a network of actors or players and their activities along the entire food value chain from inputs to production, distribution, and consumption. This aligns with the definition espoused by the Scientific Group of the UN Food Systems Summit (UNFSS), that food systems are constitutive of food actors and their interlinked activities from production all the way to consumption or utilization (von Braun et al. 2020).

Food systems in Africa are currently under pressure due to climate change, conflict, low productivity, rising population, changing diets with rapid urbanization, and external shocks, among other factors. The continent is not on track to achieving the Malabo target on zero hunger by 2025. Currently, the number of people facing food insecurity and the number of undernourished remain high. While some positive progress was made in reducing the number of food-insecure people in the period between 2000 and 2014, the trend has since reversed; for example, between 2016 and 2019, the prevalence of food insecurity was stabilizing in Africa, although the proportion remained the highest in the world. By 2019, the number of moderately or severely food-insecure people in the continent was 658 million. This increased to 750.9 million and further up to 794.7 million in 2020 and 2021. The prevalence of undernourishment in Africa remains high at 20.2 percent compared to the world average of 9.8 percent in 2021 (FAO et al. 2022).

Understanding the complexity of food systems and designing and implementing effective policies and programs in a coordinated way can help achieve at least 12 of the 17 Sustainable Development Goals (UNEP 2016). The complexity of food systems combined with their multifaceted impacts on human and environmental health has made it difficult for policymakers to target a specific challenge in the food systems (Herforth et al. 2022). To overcome such difficulty, policymakers must rely on food system diagnostics to identify critical leverage points for intervention and guide their policy decisions.

Food system diagnostics are a systematic analysis and assessment of various components and interdependencies within a food system. The process involves identifying the main components within a defined context and assessing their functionality, with specific focus on linkages and interdependences, which are usually complex and dynamic. The assessment goes further to highlight strengths, weaknesses, and challenges in a country's food system. By understanding the complex dynamics of a food system and evaluating the implications of related policies, stakeholders can identify food system policy gaps, determine achievable targets, promote sustainable agricultural practices, and explore existing opportunities for food system transformation (Rockefeller Foundation et al. 2021b). In Africa, the food systems discourse has recently had three important phases:

1. *Prior to 2021 UNFSS*, several countries (including Malawi) undertook country-level dialogues, conducting stakeholder engagements at regional, continental, and global levels.
2. *At the UNFSS itself*, countries made commitments to undertake food system transformation. After the UNFSS, the UN's priority action is for countries to develop and implement national pathways to the year 2030 for food system transformation.
3. *After the UNFSS*, there have been calls for development of robust mechanisms for tracking progress in food system transformation in the continent.

Given this recent historical context, where would food system diagnostics play a critical role in food system transformation? Food system diagnostics could potentially play an essential role in shaping food system transformation strategies at the country level as well as benchmarking food system changes. Diagnostics can help identify critical drivers of food system transformation and identify critical indicators for tracking changes in food system transformation in the country. Several African countries— including Ghana, Malawi, and Rwanda—undertook food system diagnostics to address the country's complex food systems challenges and developed long-term visions to transform their food systems. These were conducted in the period leading up to the UNFSS in 2021

under the Food System Transformative Integrated Policy (FS-TIP) initiative. The initiative developed a toolkit that guides users to conduct a landscaping and diagnostic analysis of a country's food system to generate a thorough, systematic, and comprehensive overview of a national food system. This overview then forms the basis from which policymakers and other stakeholders can map their food system transformation agenda through integrated policies and investment programs.

Though essential for greater accountability toward healthier and more environmentally friendly food systems, there are very few robust food system diagnostics and policy assessments currently being conducted. Lack of data and information on these components and their functions makes it difficult to assess the current state of food systems properly (Sokourenko et al. 2022). Furthermore, opportunities and challenges unique to a particular country or region can be difficult to effectively identify and address. It is often especially challenging to gain an accurate view of the underlying biological and ecological systems, as well as to quantify the various socioeconomic and cultural factors that impact food production, processing, distribution, purchasing, and consumption (Herforth et al. 2020). Moreover, these complexities are further compounded by power dynamics at play, such as the disparity in wealth and access between small-scale producers, large-scale commercial distributors, and both wholesalers and retailers. Therefore, the development of appropriate and adequate diagnostics and assessments is essential not only for assessing the performance and sustainability of food systems but also for ensuring proper accountability toward enhancing the nutritional sustainability and low environmental impact of food systems. The most recent comprehensive food systems diagnostics assessments were conducted under the FS-TIP initiative but were limited to three countries (Ghana, Malawi, and Rwanda). Lessons gained from these assessments can be useful to other countries that intend to carry out such assessments in the future.

Using the case study of food system diagnostics undertaken in Malawi under the FS-TIP initiative, this chapter aims to demonstrate the role of food system diagnostics informing policy options to guide food systems transformation. The specific objectives of the chapter are (1) to illustrate the importance and pivotal role of diagnostics in guiding food systems transformation initiatives, particularly around the policy aspects; (2) to use Malawi as a case study illustrating how diagnostics were crucial to shaping the country's food systems initiatives; and (3) to review the country-level experiences, challenges, and lessons learned during the FS-TIP work in Malawi.

Conceptual Framework for Guiding Food System Diagnostics

Food systems are complex, interconnected networks of actors involving producers, processers, distributors, retailers, consumers, and policymakers. All components of a food system interact to produce food while also considering environmental, economic, and social impacts (Ericksen 2008). Food systems ultimately aim at providing a safe, nutritious, and accessible food supply to everyone. A "food systems approach" has gained increased prominence as it is a key component in addressing global challenges such as food security, nutrition, climate change, biodiversity loss, and social inequalities. According to Rockefeller Foundation and others (2021b), this calls for an integrated approach to ensure the linkages between the different components of the food system are effectively monitored, understood, and leveraged. A food systems approach ensures that there is continuous engagement and collaboration across different stakeholders among food systems actors, without leaving behind those most affected by food insecurity (Bortoletti and Lomax 2019). This enhances the capability of sustainable food system to efficiently respond to local and domestic circumstances and global challenges.

Given the nature of food systems, food system diagnostics require a systems thinking, holistic approach by considering various interconnected components within and across production, processing, distribution, consumption, and waste management as well as their interactions with social (that is, culture and traditions) and climate-environment ecosystems. This uncovers the interdependencies and complexities within the system and thereby helps to identify integrated interventions and promote broad stakeholder engagement. It promotes collaboration and dialogue that leverages each stakeholder's resources and capacities addressing food system challenges, fostering collective action for transformative change. It helps bridge the gap between scientific knowledge, local context, and policy implementation, facilitating evidence-based decision-making and fostering sustainable food system transformations. Diagnostics also help identify vulnerabilities to shocks and stresses such as climate change, natural disasters, or socioeconomic disruptions and enables the development of strategies to build a more resilient and sustainable food system. Diagnostics establish baseline data and indicators to monitor and evaluate the performance of the food system over

time. The process helps track progress, measure the impact of interventions, and identify areas that require further attention or adjustment.

Food system diagnostics involve an iterative process with multiple stakeholders at country level. They encompass both qualitative and quantitative processes that aim to identify priority challenges and game-changing solutions to transform the food system to deliver on desired outcomes. The process starts by assessing country performance to identify the main food systems challenges and potential transformative solutions that are then validated by stakeholders. The identified challenges and solutions are then analyzed in detail and aligned with country stakeholders. This diagnostics process enables country stakeholders to broadly assess their food systems, identify drivers of change, prioritize key challenges, and develop innovative solutions. It also identifies indicators for measuring food system transformation from the lowest level to the highest, referred to as *supra-indicators*.

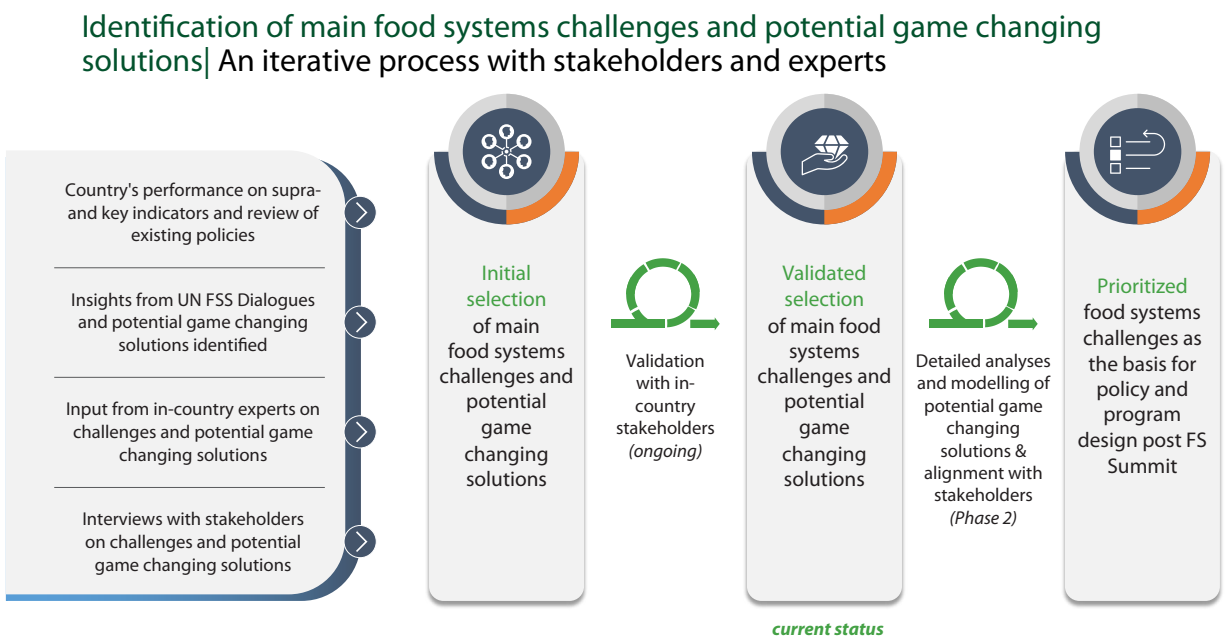
The diagnostics process also benefited from feedback from various local experts and stakeholders across Malawi's food systems, including the Ministry of Agriculture, Ministry of Health, Ministry of Trade, Farmers Union of Malawi, the Agricultural Development and Marketing Board (ADMARC), and others. The FS-TIP initiative also supported a team of local researchers to identify key challenges and draw out recommendations on food system strengthening. The FS-TIP program management office and an advisory committee provided guidance and overall coordination in the food system diagnostics process. Thus, the diagnostic analysis was informed by extensive research and feedback, and the identification of the main food systems challenges and potential game-changing solutions was therefore largely an iterative process with stakeholders and experts.

The processes involved in the diagnostics are summarized in Figure 3.1, and key steps in the analysis are described in the sections that follow.

Methodology of the Food System Transformative Integrated Policy

To undertake the food systems diagnostics and policy implications in Malawi, a series of steps were undertaken by a large coalition of diverse stakeholders. The research process followed a five-part qualitative framework adapted from the Food Systems Dashboard, examined 22 quantitative supra-indicators across the five UNFSS action tracks, and included an exercise in stakeholder and policy landscaping (GAIN 2023). The research from these steps was further complemented by emerging insights from the national, regional, and district Food Systems Summit Dialogues that took place to articulate food systems transformation gaps and potential ways to address them.

FIGURE 3.1—SUMMARY OF THE PROCESS OF DIAGNOSTICS IN MALAWI



Source: Rockefeller Foundation et al. (2021a).

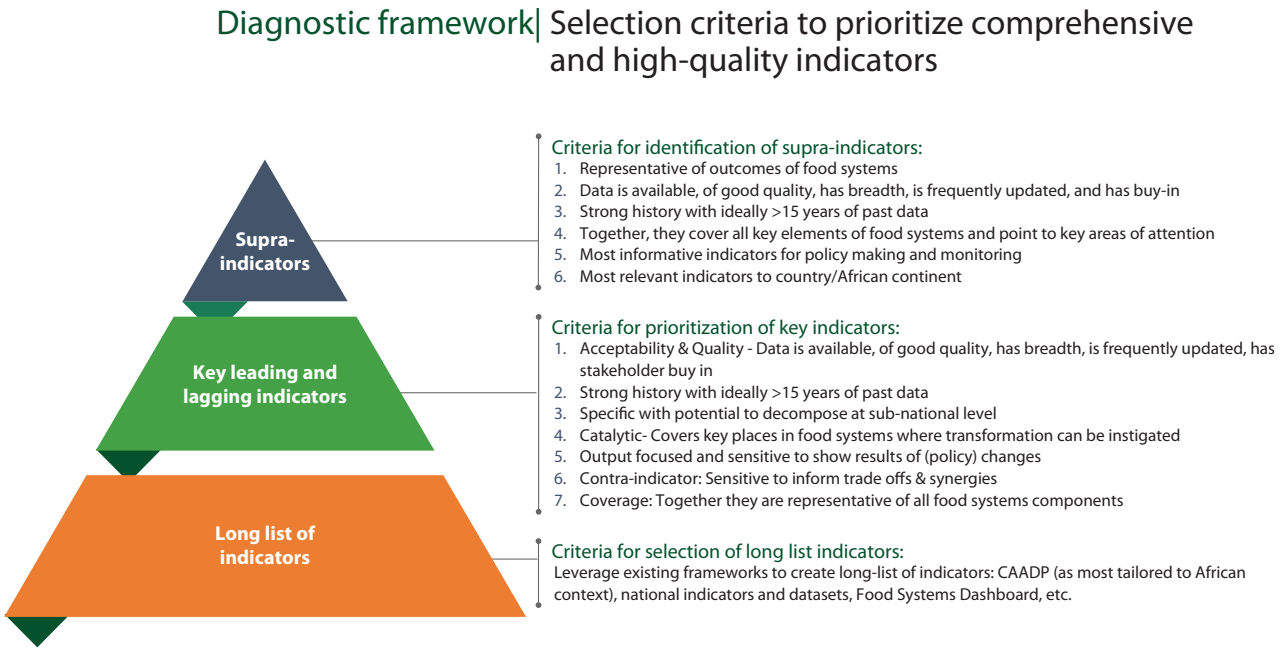
Qualitative and Quantitative Diagnostics

The qualitative aspect of the diagnostics used qualitative discussions with stakeholders on external drivers of the food system, the nature of food supply chains, food and the environment, and consumer characteristics, as well as cross-cutting issues such as gender, youth, and human rights. These qualitative discussions were held throughout the subnational and national stakeholder consultations (see Rockefeller Foundation et al. 2021a).

Under the quantitative component, the food systems diagnostic analysis was structured along three levels on indicators and aligned to the UNFSS action tracks and action areas for their outcome orientation. At the highest level, supra-indicators reflect desired outcomes of food systems transformation that are representative of the UNFSS action tracks. The research involved selecting and analyzing four to five supra-indicators per UNFSS action track that represent outcomes of food systems transformation and key cross-cutting elements such as governance, to enable easy assessment of the country's status and main areas of attention. The second level of indicators, referred to as *leading and lagging indicators*, enable identification of main high-level drivers for good or bad performance on food systems transformation. The leading indicators are drivers of supra-indicators, while the lagging indicators show the effects of supra-indicators on the population, environment, and other factors. The third level, *other indicators*, represent intermediary parameters across all components of the food system. These were analyzed to provide a granular view of outcomes and drivers of food systems transformation. To source indicators, the analysis used existing resources such as CAADP, the Food Systems Dashboard, and national policies (Rockefeller Foundation et al. 2021a). Stakeholder input helped to identify the interdependencies, feedback loops, and trade-offs between indicators by linking supra-indicators to key leading and lagging indicators as well as linking the quantitative results to the qualitative considerations. Figure 3.2 summarizes the selection of indicators process.

The criteria described in Figure 3.2 led to the identification and prioritization of 22 supra-indicators, with 21 identified across the food system tracks and one identified as cross-cutting (Table 3.1). Importantly, while diagnostics can be done at the national level, a complete picture would require gathering, analyzing, and presenting data that can be disaggregated at a much more granular level. For example, disaggregating data on supra-indicators for regions, income groups, genders, and age levels would allow narrowing in on those areas that require the most attention and developing tailored policy interventions. Following the

FIGURE 3.2—THE SELECTION CRITERIA FOR FOOD SYSTEMS INDICATORS FOR EXAMINATION



Source: Rockefeller Foundation et al. (2021a).

identification of indicators, the analysis involved collecting data in collaboration with national experts, leveraging national databases as well as stakeholder consultations and a review of literature, followed by an analysis of data gaps. The Malawi diagnostic analysis built a data- and information-base that is as comprehensive as possible, with a recognition of its limitations in terms of indicator and data availability. The diagnostics identified these gaps and proposed solutions to close them in a prioritized and cost-efficient manner.

Analysis of Policy Gaps

In addition to the qualitative and quantitative analyses, the diagnostic process involved a further analysis of the policies relevant for the delivery of food systems to identify policy areas that would need reinforcement or revisions for food system strengthening. This process examined policies at the international, continental, regional, national, and subnational levels in the context of the key food system elements as well as the five UNFSS action tracks. Policies were mapped to assess coverage and alignment with food systems components of the UNFSS action tracks. The analysis highlighted potential gaps or conflicts between policy areas and identified potential policy implications.

Stakeholder Engagement

For the diagnostic process results to be useful, securing buy-in from key stakeholders within the country is essential. The key government ministries, departments, and agencies must see the need for these assessments and must understand why the systems approach is useful as compared to the previous siloed approaches to the appraisal of food security. In the Malawi case, the researchers and collaborators held many meetings with the minister of agriculture, department heads of many ministries, and other leaders from the agriculture, health, energy, and water sectors to secure buy-in and cocreate steps in the assessment process. These steps ensured local buy-in.

The assessment involved a wide range of food system stakeholders and actors that can largely be grouped into six constituencies: (1) private sector actors such as farmers, food manufacturers, traders, retailers, food services, input suppliers, processors, transporters, retailers, and consumers; (2) public institutions, including policymakers at various levels of government in various ministries, departments, government-owned institutions, and agencies; (3) development partners; (4) civil society organizations; (5) research organizations; and (6) farmer organizations. Food system diagnostics must involve these constituencies for the results to reflect reality and be put to use.

Results

The results presented here include three key areas covered by the food system diagnostics: (1) Malawi's status on the 22 supra-indicators, (2) key food systems challenges emerging from the analysis, and (3) policy gaps and their implications for Malawi. Results from additional analysis carried out under FS-TIP, including high-level syntheses of the food systems elements drawing from the qualitative analysis, are provided in Rockefeller Foundation and others (2021a).

Malawi's Performance on Supra-Indicators

Table 3.1 presents the status of the food system as summarized by the current values of the supra-indicators. Indicators are organized according to the five UNFSS action tracks.

Access to Safe and Nutritious Food for All

Supra-indicators related to the UNFSS action track on ensuring access to safe and nutritious food for all include measures of diet quality and nutrient supply, undernourishment and overnourishment, and food safety. The Food Consumption Score measures diet quality by aggregating household-level data on diversity and frequency of food groups, weighting according to the relative nutritional value. On this indicator, Malawi scores "poorly" (1 percent) and "borderline" (16 percent). Most Malawians do not have an adequately diverse diet, with 70 percent of dietary energy derived from cereals, roots, and tubers (GAIN 2023). This is largely due to overreliance on maize cultivation, which reduces production and availability of nutrient-rich foods (such as fruits and vegetables) and increases their prices.

Nutrient supply is measured by the net supply of key macro- and micronutrients as a share of total consumption requirements for a healthy diet. There is inadequate supply of macro- and micronutrients because maize is the predominant crop grown, with limited farming of nutritious legumes and livestock, thus limiting their availability and increasing the cost of a nutrient-adequate diet (see the supra-indicator on affordability). There are also limited imports to fill dietary gaps and high levels of food loss along the value chain, resulting in part in the population not having access to a diverse diet (GAIN 2023).

TABLE 3.1—CURRENT STATUS OF MALAWI'S FOOD SYSTEM CAPTURED IN SUPRA-INDICATORS

Action tracks	Supra-indicators	Indicative source	Unit	Malawi	Sub-Saharan Africa	World
1. Ensure access to safe	**Diet quality:** Food Consumption Score	WFP CFSVA	%	Poor: 1 Borderline: 16	97.3	86.5
	Nutrient supply: Net supply in country of key macro- and micronutrients as a share of total consumption requirements for a healthy diet	National Survey		Nutrient gaps	43.9	47.0
	Undernourishment: % of population undernourished	World Bank	%	18.8	24.1	8.9
	Overweight and obesity: % of population overweight or obese (adult population)	WHO	%	20.1	41.7	39.1
	Food safety: Food Systems Safety Index	WHO	Index (0–100)	66.7		75.3
2. Shift to sustainable consumption patterns	**Affordability:** Cost of a healthy diet as a percent of household food expenditure	FAO-SOFI	%	219		95
	Sustainability of diets: Per capita GHG emissions of food consumption	WWF	Kg CO2eq./person	1,369		2,603
	Food waste: Food Waste Index	UNEP	Kg/capita/year	146.0	120-170	121
	Food environment: Composite index combining food environment policies	WHO NCD Monitor	Index (0–14)	3		n.a.
3. Boost nature-positive production	**Emissions:** GHG emissions from agriculture	Climate Watch	MtCO2e	7.5		30.1
	Land: Average % forest land being deforested for agriculture use over past 3 years	World Bank, Forest Watch	%	0.55		0.17
	Food loss: % food loss across supply chain	National sources	%	15		5
	Regeneration: Biodiversity and habitat index	BHI	%	50.7		54.5
4. Advance equitable livelihoods	**Income**: Gini coefficient (specific) based on incomes across the food system	National survey	Coefficient (0–1)	0.45	0.442	n.a.
	Income: Gap between farmgate price and wholesale price	CAADP Biennial Review	%	68	n.a.	n.a.
	Gender equity: Women's Empowerment in Agriculture Index	IFPRI	Index (0–1)	0.84	n.a.	n.a.
5. Build resilience to vulnerabilities, shocks and stress	**Economic:** Household Resilience Capacity Index	National survey	Index	0.26	n.a.	n.a.
	Risk distribution: Proportion of men and women engaged in agriculture with access to macro- and microcredit financial services	CAADP Biennial Review	%	12	n.a.	n.a.
	Social: Government social security budget as a % of total requirements to cover vulnerable social groups	CAADP Biennial Review	%	87.0	n.a.	n.a.
	Environmental: ND-GAIN Country Index	ND-GAIN	Index (0–100)	35.2		49.0
	Production diversity: % production from top 5 crops	FAO	%	75	n.a.	n.a.
	Governance: Presence of food systems–related governance bodies and mechanisms	National policies	Index (0-16)	3	n.a.	n.a.

Source: Rockefeller Foundation et al. 2021a.

Note: n.a. = not applicable; ND-GAIN = Notre Dame Global Adaptation Initiative; WFP CFSVA= World Food Program, Comprehensive Food Security & Vulnerability Analysis; WHO= World Health Organization; FAO-SOFI= Food and Agriculture Organization- The State of Food Security and Nutrition in the World; WWF=The World Wide Fund for Nature; Kg CO2eq= kilograms of carbon dioxide equivalent; UNEP= United Nations Environmental Program; NCD = noncommunicable diseases; MtCO2e= Metric Tons of Carbon dioxide equivalent; EPI= Environmental Performance Index; BHI = Biodiversity and habitat index.

Undernourishment has been on the rise from 17 percent in 2014 to 19 percent in 2018 due to food insecurity affecting 52 percent of Malawians. For children, 23 percent of all child deaths are related to undernutrition, with 39 percent of children under 5 years old considered stunted while 4 percent suffer from acute malnutrition. Among younger children, only 60 percent of children younger than 6 months old are exclusively breastfed, and 8 percent of children ages 6–23 months consume a minimum acceptable diet (GAIN 2023). One driver of this undernourishment is the fact that subsidized maize production and tobacco cultivation for export reduce supply, availability, and affordability of more nutritious produce. Potential interventions include providing subsidies for

farming nutritious and/or biofortified food (such as livestock, fruits, and vegetables) along with resilience and soil management support through agricultural programs such as the Affordable Input Program (AIP) to increase availability and affordability of nutritious food. Collaboration between ministries to sponsor targeted behavior change communication to drive desired nutrition, hygiene, and other health practices should be encouraged.

The percentage of the adult population considered overweight or obese is estimated at 20.1 percent. Although Malawi's obesity rates are lower than regional rates, both adult and child obesity are rising steadily by about 8 percent compound annual growth rate from 2010 to 2016 (GAIN 2023). Specifically, 13 percent of children and adolescents, 25 percent of women, and 15 percent of men are overweight or obese, with higher prevalence in urban areas than rural areas. One key driver of overweight and obesity is rising urbanization, with increased sedentary behaviors and less consumption of own-grown food in urban areas. The rising overweight and obesity rates are linked to rising rates of diet-related noncommunicable diseases such as diabetes (which increased from 4.6 percent of adults in 2000 to 6.3 percent in 2014) and high blood pressure (which increased from 26.5 percent of adults in 2000 to 28.7 percent in 2015), contributing to Malawi's overall disease burden.

Although food safety has improved in recent years, there are still substantial gaps to reach global standards, as illustrated by Malawi's low performance on the Food Systems Safety Index (66.7 percent) as compared to the world average (75.3 percent). There is no nationwide strategy for food safety control (Morse et al. 2019), and there is inadequate monitoring of food standards. Malawi has an extensive food regulatory framework of policies and standards, but it is fragmented and lacks harmonization, with oversight of food safety issues shared among six ministries. A food safety act is currently being developed within the Ministry of Health. Food safety challenges are partly attributable to limited collaboration across departments and ministries due to overlaps in departments and mandates. The quality of inspection services is impacted by underresourcing of food inspectors and lack of guidance and consistency (Rockefeller Foundation et al. 2021a). Surveillance of foodborne disease is constrained by underdeveloped infrastructure and limited research on the bacteriological and chemical contamination of food. However, significant steps have been made in surveillance of aflatoxins due to their major impact on both trade and health.

The resulting high levels of food loss, food waste, and increasing disease burden (such as liver cancer associated with aflatoxins) have economic and health costs to the population. In the absence of an integrated approach to food safety regulations, enforcement, and public awareness and mindset, foodborne diseases will continue to lower the quality of life for people in Malawi, affecting overall productivity and well-being.

Sustainable Consumption Patterns

The UNFSS action track on shifting to sustainable consumption patterns is represented by indicators on food affordability, diet sustainability, food waste, and the food environment. The cost of a healthy diet is estimated at 219 percent of average household food expenditure, suggesting that a healthy diet is very costly and out of reach for many Malawians. The drivers include a relatively high share of cereal farming, with 70 percent of Malawians cultivating maize while only 25 percent and 45 percent farm fruits and livestock, respectively, thus impacting supply and affordability of more nutritious food (Rockefeller Foundation et al. 2021a). Foods typically come from own production—which relies on small land parcels and low-yield agriculture practices—or are bought from markets constrained by poor infrastructure. Many farmers' low incomes limit purchasing power and ability to buy products when own production is insufficient. Malawians spend up to 65 percent of income on food, mainly on cheaper cereals, roots, and tubers (the source of 70 percent of dietary energy), which are less nutritious than the costlier animal-source foods (ASF), legumes, fruits, and vegetables. In addition to promoting agricultural diversification for export, there is need to promote diversification for domestic consumption. It is also important to educate communities on the benefits of cultivating and consuming indigenous nutrient-dense foods such as beans and to encourage farming of nutritious and/or biofortified foods (for example, via the AIP subsidy program or tax credits) to increase supply and affordability.

Fresh food waste is a health and urban management problem in Malawi. The UNEP Food Waste Index shows that Malawi wastes more food per capita than the global average despite high levels of food insecurity. The drivers include poor home storage practices leading to rodent and weevil infestation and/or rotting (GAIN 2023). There is also a prevalence of traditional open-air markets, which produce more waste than modern markets. Among modern markets, the few large retail outlets have very high levels of food wastage, especially of fruits and vegetables. However, there is lower food wastage in rural areas than urban areas due to subsistence farming and the prevalence of eating own-grown food

in rural areas. In the city of Blantyre (GAIN 2023), the city council transports the waste from markets to a composting facility where it is turned into rich, organic compost eventually sold to farmers.

As suggested by Malawi's relatively low performance on the composite index combining food environment policies (the Healthy Food Environment Policy Index), there is an opportunity to strengthen Malawi's food environment, as it currently has few policies that encourage consumption of sustainable and healthy diets. Malawi has no restrictions on marketing junk food and nonalcoholic beverages to children. There is also no policy to reduce consumption of salt/sodium and saturated fatty acids. However, it has provisions guiding the marketing of breastmilk substitutes. Interventions could be focused on filling current gaps in food environment policies by reducing tax on healthy foods and increasing tax on unhealthy foods, as well as by restricting the promotion of unhealthy foods to children. Developing consumer guidance mechanisms to help consumers make informed choices could also be worthwhile.

Nature-Positive Production

Current status regarding the UNFSS action track on boosting nature-positive production is measured through indicators on greenhouse gas (GHG) emissions from agriculture, deforestation, food loss, and biodiversity and habitat regeneration. Malawi's agriculture-related GHG emissions are lower than the world averages but have been rising steadily since 2000. Agriculture contributes 40 percent of GHG emissions (Rockefeller Foundation et al. 2021a) in Malawi. Drivers include indiscriminate use of fertilizer due to highly subsidized availability of this input, limited knowledge among farmers and extension workers, and an increase in conventional farming (tillage) that releases carbon into the air. However, GHG emissions are moderated by generally short transport distances for food consumed (World Bank 2017) and low farming of animal products, which tend to have higher environment impact. As Malawi shifts toward commercialized agriculture, it must consider the long-term sustainability within the food system. To boost efficient, nature-positive production, pathways include investments in sustainable ASF as well as increasing the efficiency of fertilizer usage.

Agriculture is the leading cause of deforestation in Malawi—in 2019, 90 percent of deforestation was driven by agriculture (GAIN 2023). Forest cover reduced from 47 percent in 1975 to 25 percent in 2018 (World Bank 2017), the highest deforestation rate in the Southern African Development Community region. Drivers include the growing population that is overdependent on agriculture and seeking to expand small land holdings, as well as floods and droughts that lead to soil depletion and drive farmers to clear more land. Although Malawi has a Forestry Act to guide the proper use of forest land, 95 percent of the population is unaware of the act and the importance of forests (World Bank 2017). One of the key solutions to addressing deforestation is to improve the productivity of existing land to reduce the drivers of deforestation, as well as developing other industries to reduce overdependence on agriculture, increasing awareness about the importance of forests, and training farmers on income-increasing opportunities in conservation agriculture and agroforestry.

Malawi is ranked 37 out of 53 African countries on the Biodiversity and Habitat Index (Rockefeller Foundation et al. 2021a). Drivers of biodiversity and habitat loss include deforestation, lack of awareness of the benefits of biodiversity to farmers, and excessive use of pesticides that kill pollinators. While agriculture remains crucial to Malawians, its sustainability and productivity is integrated with the level of biodiversity in the country. Without registering and preserving biodiversity, Malawi risks a reduction in diversity of food and medicinal plants, and an overall less resilient food system. There is a need for investments in eco-friendly technologies and improved articulation and socialization of biodiversity goals.

Malawi's rate of food loss across the supply chain is higher than the world average, with farmers losing from 15 to 50 percent of their hard-earned yields to pests and decay (GAIN 2023). Drivers include poor food storage and handling, limited testing infrastructure resulting in aflatoxins in key foods, and low-quality agricultural infrastructure such as low electrification and a poor transportation system. High levels of food loss in Malawi raise food insecurity, decrease dietary diversity by discouraging the production of nutrient-rich perishable foods, and waste resources, thereby putting an unnecessary burden on the environment. Possible interventions include sustainable investment in storage, electricity, and logistics infrastructure, as well as better education of farmers, middlemen, and processors on loss prevention practices.

Equitable Livelihoods

The UNFSS action track on advancing equitable livelihoods is represented through indicators on income inequality and gender equity. Malawi's Gini coefficient based on incomes across the food system is estimated at 0.45, indicating higher inequality than the sub-Saharan Africa average of 0.44. The Malawi

Livelihood Baseline Profiles carried out by the Famine Early Warning Network (FEWS-NET 2016) recognizes four income profiles: "very poor," "poor," "middle," and "better off." Throughout the country, 64 percent of rural Malawians are found in the bottom two wealth groups. The drivers include low-productivity and limited value-added agriculture (due to crude agricultural techniques and limited use of improved inputs) that is the main income source for the majority of the population, combined with a lack of income-generating opportunities outside farming in rural areas (GAIN 2023).

Malawi shows a limited gap between farmgate and retail prices, with a price difference 45 percent smaller in Malawi than price differences in other African countries, likely related to government intervention (World Bank 2017) around setting price floors for farmgate maize and price ceilings for retailing. Although ADMARC (the national maize aggregator) works to maintain these price floors and ceilings, private-sector activities—buying maize from ADMARC and reselling at a markup in markets—often leads to price ceilings being exceeded. Maize price volatility is still a challenge in Malawi despite government intervention. This causes fluctuations in food insecurity levels based on the maize season. Potential interventions include deploying maize market interventions at the optimum time and frequency to counteract seasonal price changes.

Gender equity is measured through the Women's Empowerment in Agriculture Index (WEAI) developed by the International Food Policy Research Institute. Malawi's WEAI score is 0.84 on a scale from 0–1, with higher scores indicating greater empowerment and gender parity. Although an average WEAI score for Africa is not available, Malawi's score was classified as medium in a 2014 study of 13 African and non-African countries (Malapit et al. 2014). About 57 percent of Malawian women are agricultural landowners. According to GAIN (2023), share of households with livestock is higher among male-led households (46 percent) than female-led households (38 percent), signifying that male-led households are wealthier than female-led households. Fewer female-led households than male-led households operate a nonfarm enterprise (31 percent vs 42 percent), which is typically more lucrative than farming. Additional challenges include smaller sizes of women-managed farms (GAIN 2023) and women's low levels of financial inclusion, with only 12 percent of women engaged in agriculture having access to macro- and microcredit. Although women have equal property ownership and inheritance rights (UNCTAD 2022), they have limited control over resources and decision-making in households and communities, especially in rural areas. Inclusion and empowerment of women in agriculture and all sectors has the potential to increase agricultural production and reduce poverty (GAIN 2023) and should be a priority backed by high levels of political will and progressive policies.

Resilience

The UNFSS action track on building resilience to vulnerabilities, shocks, and stress is captured through indicators measuring economic, social, and environmental resilience as well as distribution of risk and production diversity. Economic resilience to shocks, as measured by a Household Resilience Capacity Index based on household survey data, is low, especially in rural areas where access to basic services and infrastructure is limited. Drivers include high poverty rates and inadequate high-quality livelihood and employment support services for the poorest households. Overreliance on cash crops (such as tobacco) and drought- and flood-sensitive maize cultivation reduces resilience for farmers. Frequent occurrence of floods and droughts often leads to food crises, with millions of people requiring aid to prevent malnutrition and potentially death. Potential interventions to improve households' resilience include providing more credit and insurance to protect smallholder farmers against extreme weather and pest infestations, ensuring the National Food Reserve Agency always has adequate stock and proactively analyzes and manages food crisis risk, and providing infrastructure that helps build household resilience.

Financial resilience to risks is hampered by low financial inclusion rates among both men and women, as only 12 percent have access to credit. Relatives and neighbors make up a large share of loan sources, and informal savings groups help to bridge the credit gap. High interest rates and inadequate collateral hinder access to credit, particularly in rural areas. Other challenges include low levels of financial literacy with limited access to information. Increased access to financial services would improve Malawians' resilience and enable them to invest more in increasing farm productivity. Potential interventions to improve financial access include investing in de-risking initiatives to facilitate private sector creation of tailored credit and insurance products for smallholder farmers, particularly women. There is a further need to strengthen existing savings groups as well as to encourage banks to streamline loan application and approval processes and to invest in financial literacy programs.

Malawi has an active social protection program, although it is usually externally funded. Social welfare was allocated a total of MWK 65 billion in FY 2019–2020, up from a revised estimate of MWK 43 billion in 2018–2019 (GAIN 2023). However, it is still insufficient to cover the entire vulnerable population, with the government social security budget as a share of total requirements estimated at 87 percent. Digitization of the government's Social Cash Transfers Programme (locally known as *Mtukula Pakhomo*) has been introduced to reduce delays and operational cost. High population growth rate and limited paths out of poverty are putting pressure on limited social welfare budgets. Potential interventions to improve the effectiveness of social welfare include increasing the accessibility of interventions to reach the most vulnerable population as well as updating benefit amounts to manage impacts of seasonal food price volatility.

Environmental vulnerability is assessed through the Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index, which summarizes a country's climate change vulnerability and its readiness to improve resilience. Malawi has high vulnerability (ranked 23rd most vulnerable) and a low change readiness score (ranked 23rd least ready out of 181 countries) (Global Nutrition Report 2022). Drivers of vulnerability include low capacity to acquire and deploy agriculture technology, overreliance on flood- and drought-sensitive maize combined with increasing risk of floods and droughts, and high levels of deforestation that increase the risk of floods, particularly in the southern region. Agricultural intensification needs to be implemented and monitored in conjunction with strategies to reduce climate change vulnerability and build adaptive capacity in food systems. Mitigation approaches could focus on improving monitoring, forecasting, and risk assessment capacities along with timely risk information sharing and educating farmers on modern eco-friendly farming techniques.

Malawi's production diversity is relatively low, with a high share of production from the top five crops. The top five produced crops in the country in 2019 were maize, sweet potatoes, cassava, sugarcane, and mangoes, with about 70 percent of Malawians cultivating maize. Maize-based farming was an integral part of Malawi's agricultural development, which continues to influence agricultural interventions and Malawians' perception of maize as their key food item.

Government subsidies on maize seeds make maize cheaper to grow, and dividing the country into agricultural development zones with guidelines on standard crops for production also reduces on-farm production diversity. High dependency on a limited set of crops can be risky in the face of extreme weather conditions and pest infestation. Potential interventions include encouraging farming of a wide range of nutritious, biofortified, and/or drought-resistant crops via the AIP, tax credits, and other programs.

Governance

In addition to indicators associated with the five UNFSS action tracks, a final supra-indicator assesses food systems governance by examining the presence of governance bodies and mechanisms related to food systems. Malawi demonstrates a willingness to look at food systems in a holistic way and high-level support for food system transformation, but governance structures still need to be put into place. The country has no explicit long-term goals or framework to investigate food systems transformation and no permanent supra-ministerial body for food systems transformation with a strong mandate, dedicated resources, and required capabilities. The agriculture sector implements a joint sector platform for performance appraisal and tracking. Such platforms are critical for improving coordination and ensuring mutual accountability among stakeholders. However, coordination across ministries and departments remains a challenge.

Key Challenges Facing Malawi's Food System

Table 3.2 shows some of Malawi's main food system challenges that arose from food system diagnostics. The challenges focused on three of the five action tracks (diet quality and nutrition security, livelihoods equity, and environmental resilience) and on key challenges of infrastructure and agricultural productivity.

Diet Quality and Nutrition Security

This was identified as a priority area because the diagnostics and country-level engagements indicated that Malawi had recently been working to reduce dependence on maize to grow more resilient crops and reduce food insecurity. The country experiences high rates of undernourishment and child malnutrition, and limited dietary diversity has negative impacts on population health, well-being, and productivity. The key drivers of this situation include challenges with food availability, affordability, and food preparation. Farmers typically sell limited amounts of high-quality nutritious food while retaining staple crops such as maize for their own consumption, and nutrient-adequate diets are unaffordable to many. Food preparation and consumption practices are based on culturally acceptable methods rather than nutrition-sensitive approaches.

TABLE 3.2—MAIN FOOD SYSTEM CHALLENGES AND POTENTIAL GAME CHANGERS

Category	Diet quality and nutrition security	Livelihoods equity	Environmental resilience	Infrastructure capacity	Agricultural productivity
Priority challenges	52% of Malawians are food insecure, and 70% of dietary energy comes from cereals, roots, and tubers, with limited consumption of more nutritious foods such as legumes and animal-source foods	Majority (50–70%) of Malawians live under the poverty line, with female-led households typically poorer. They manage by consuming cheaper, less nutritious meals, contributing to high rate of undernourishment	Almost annual occurrence of floods or droughts combined with overdependence on maize, a drought-sensitive crop grown by 70% of Malawians, resulting in high levels of food insecurity	Limited local processing, storage, and transportation infrastructure, especially for perishable nutrient-rich fruits and vegetables, results in low availability in local markets and high food loss and waste	Current crop yield is as low as about 20% of potential yield, with 75% of crop production coming from smallholder farmers who use crude techniques and have limited credit and insurance access
Potential game-changing interventions	• Strengthen end-to-end planning for nutrition-sensitive production (including inputs for nutrient-rich foods, sustainable fish farming and fishing, and seeds) • Develop strategies for behavior change communication and trade to boost healthy foods consumption	• Invest in agriculture commercialization and extension services for a path out of poverty • Facilitate private sector creation of credit and insurance products for smallholder farmers, particularly women • Link social support and input programs to maximize synergies	• Prioritize drought- and flood-resistant crops and animal breeds • Invest in eco-friendly irrigation, processing, storage and logistics infrastructure to reduce water and food wastage • Increase awareness of importance of forests and train farmers on conservation agriculture	• Strengthen market linkages and infrastructure to facilitate better storage and local trade • Develop and implement strategy to increase PPPs to invest in infrastructural development • Incentivize credit extension for infrastructure.	• Increase commercial farming and put measures in place to reduce disease vulnerability • Invest in community food storage facilities and structured markets to limit food loss and waste • Improve effectiveness of anchor farming and farming cooperatives via training

Source: Authors, based on Rockefeller Foundation et al. (2021a) for Malawi.
Note: PPP = public- private partnership.

Key steps need to be taken to increase demand, affordability, and access to more nutrient-rich foods such as legumes, fish, fruits, and vegetables. The benefits of addressing diet quality and nutritional security are clear: By increasing Malawians' consumption of adequate, healthy diets, Malawi can make progress toward the 2025 goal of reducing stunting to 27 percent, reducing child mortality to 2.5 percent by 2030, and reversing the trend of increasing obesity and overweight rates. Improved nutrition could also contribute to better cognitive development, increasing Malawians' lifelong productivity.

However, achieving this requires facing that there are trade-offs to consider. For instance, fixing price caps on nutritious food could increase their affordability but would reduce farmers' income and discourage production. On the other hand, increasing consumption of ASF (especially beef) to desirable levels would increase diet diversity but may also increase GHG emissions that negatively affect the environment. Again, while increased local consumption of more nutritious foods (such as legumes and ASF) would be good for Malawians' health, it could leave less for export and reduce export income if production remains constant.

There are also some policy opportunities and implications if diet quality and nutrition security priority are to be achieved. Policies focus on maize subsidies and availability, with less attention paid to increasing production and access to other foods such as legumes and fruits, and these would need to refocus to ensure that other nutritious crops also receive emphasis. The challenge of changing the current orientation toward maize-based diets is that it may be difficult to shift Malawians' long-held consumption habits. There is also a need to increase the purchasing power of a growing, agriculture-dependent population to ensure that they can afford other sources of nutrients.

Environmental Resilience

Environmental resilience is a key action track and priority area for Malawi, considering that Malawi's GHG emissions from food consumption and agriculture are on the rise due to increasing deforestation for agricultural purposes. This is exacerbating Malawi's vulnerability to floods and droughts, which ultimately reduces food supply. Malawi needs to strengthen and expand its agriculture transformation programs to increase environmental resilience. Addressing this challenge is beneficial because increasing Malawi's environmental resilience could increase agricultural productivity, stabilize incomes, reduce food insecurity, and minimize loss of life and wealth during extreme weather conditions.

Nevertheless, addressing this priority area has some challenges and trade-offs that need to be considered. For instance, increasing water allocated for irrigation could reduce water available to generate hydropower for food storage, agriculture extension services, and other key sectors; similarly, prioritization of eco-friendly activities could lead to reduction in AIP's distribution of chemical fertilizer, thus reducing fertilizer use and agricultural productivity. Preventing deforestation increases environmental resilience but may limit expansion of small landholdings and food supply.

At the policy level, no systems approach toward improving environmental resilience (such as irrigation and storage schemes) can be done in isolation, and there are some constraints that may hamper implementation. For example, land consolidation programs can facilitate irrigation schemes but need to be equitable and beneficial to be attractive to Malawians. There are also inadequate resources to enforce forest conservation laws. Policy interventions to address these challenges should include efforts to increase resilient and sustainable production, invest in eco-friendly infrastructure, and improve awareness of conservation agriculture and agroforestry.

Infrastructure Capacity

Malawi is one of the fastest urbanizing countries in the world, with an annual urban population growth rate of about 4 percent (World Bank 2023). However, it lacks adequate agriculture infrastructure (such as supply chains, storage, electricity, processing capacity, and transport networks), which limits farmers' capacity to extend produce shelf life and reach local and international markets. This is evident in the high levels of food loss and waste, especially of nutritious but perishable fruits and vegetables.

Addressing this priority area of improved infrastructure has widespread benefits beyond increasing food safety and availability. It would also spur development of the agro-processing industry, creating more jobs and facilitating export of higher value produce for higher income. Addressing this priority area also involves some challenges and trade-offs. For instance, improved infrastructure could lead to increased food supply but also higher production and consumption of unhealthy ultra-processed food. More nonfarm jobs would increase income but could reduce food supply due to reduced farm labor, especially among youth who practice more modern agriculture. At the policy level, limited rural grid electricity development undermines rural development of agro-industry. There is also a limited focus on increasing private-sector investment and public-private partnerships in the food supply chain. A key constraint in resolving Malawi's infrastructure gaps is the limited expertise to raise funds and prioritize investment in capital-intensive infrastructure development. There are also critical human skills shortages in areas of infrastructure development. Strategies to address these challenges can include investments in affordable and sustainable energy as well as public-private partnerships for infrastructural development.

Agricultural Productivity

Another priority identified though diagnostics and consultations in Malawi is increasing agricultural productivity. Agriculture accounts for almost 30 percent of Malawi's GDP, and there are opportunities for higher productivity as current crop yields are low. About 75 percent of crop production comes from smallholder farmers with small farms and low crop yield, thus limiting food supply for sustainable and healthy diets. ASF supply has increased by 55 percent since 2010 but remains below the African and global averages. The limited production is exacerbated by high food waste and loss levels that increase food insecurity.

Increasing Malawi's agricultural productivity is beneficial because it will increase food availability and affordability, leading to increased food security and nutrition. It will also increase farmers' income and reduce need for agriculture deforestation as available farmland could yield enough to meet nutrient need. Nevertheless, addressing this priority area has challenges and trade-offs that need to be considered. Increased mechanized farming and fertilizer usage, for instance, may increase GHG emissions that hasten climate change, thus making Malawi more vulnerable to floods and droughts. Similarly, increased commercial agriculture may increase vulnerability to infestations (such as fall armyworm), while

large scale production of focus crops increases yield but could lower production diversity.

At the policy level, generalized input subsidies do not address unique soil needs, thus limiting yield potential. In addition, the focus on increasing cereal production with little attention to other nutritious foods such as legumes can undermine food system outcomes. Farmer training and timely supply of inputs to ensure proper fertilizer application and harvest are not yet addressed, and the need to prioritize farmers to subsidize for maximum yield while protecting the most vulnerable remains a key challenge. There is also pervasive poor market structure, which limits trade and income opportunities from increased production. Land consolidation can facilitate large-scale farming but would need to be beneficial to landowners, especially since rapid population growth puts pressure on limited land. To resolve these challenges, a concerted approach is needed to increase resources for farmers, including access to inputs, financial services, and training.

Livelihoods Equity

Agriculture supports 85 percent of Malawi's population. Subsistence farming characterized by low productivity and limited value-addition results in farmers having a high-risk profile, which limits credit access and income growth opportunities. Consequently, Malawi is the third-poorest country in the world by GDP per capita. It is easier for cash crop farmers (mainly men) to access credit than for food crop farmers (mainly women) because cash crop farmers earn more and are thus able to afford high credit costs. Women-managed farms are also smaller than those managed by men, which limits their production and contributes to higher poverty among female-led households.

One benefit of addressing this priority area is that unlocking Malawian's income potential is a crucial and sustainable way to empower them to live high-quality lives and reduce the country's poverty burden. It could also reduce the amount of money dedicated to social protection programs, thereby making more funds available for other key projects.

Focusing on this priority area has challenges and trade-offs. Income growth could lead to inflation, which makes food more costly for the poor population, while large-scale production of focus crops increases yield but could lower production diversity. On the other hand, promotion of better-paying nonfarm jobs increases income but could reduce food supply due to reduced farm labor. Systems approaches have limited capacity to improve livelihoods; for example, input subsidies and training have limited effect without market access, while funding shortages often mean that social assistance programs are not implemented. Other constraints include the cost of de-risking farmers to facilitate credit access. It is also difficult to reach the most vulnerable population, and there is generally more interest in suboptimal quick fixes rather than optimal long-term investments. Public investments in financial de-risking initiatives and agricultural commercialization and extension services are among potential strategies to address these challenges.

Policy Mapping and Identification of Gaps

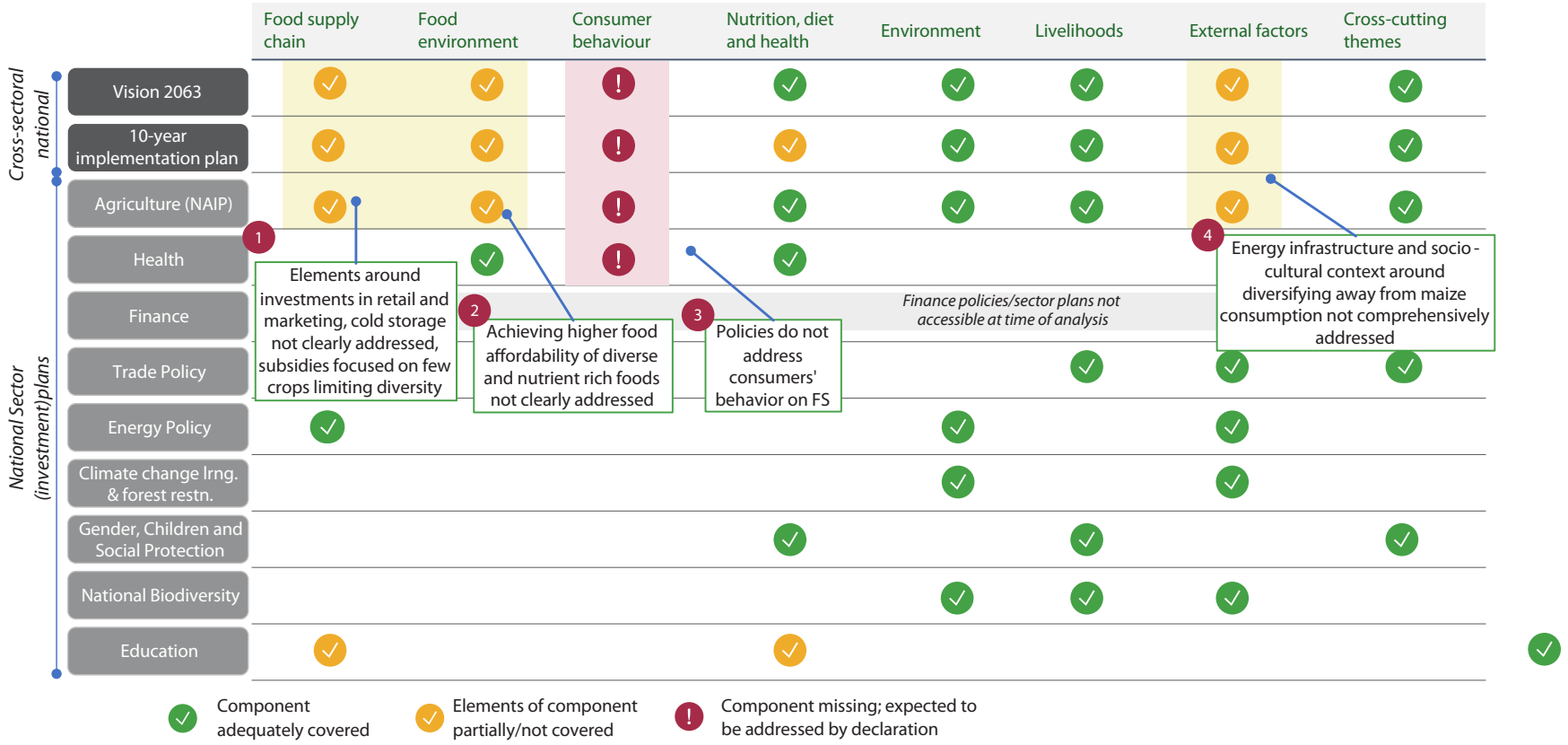
The next component of the food system diagnostic analysis involved conducting policy mapping to assess coverage of major food system components as well as the key challenges outlined above. Policy mapping also took into account cross-cutting themes of gender, youth, and human rights. In order to examine outcomes from the food system, the analysis also included the ability of policies to support nutrition, diet, health, livelihoods, and environmental health.

Figure 3.3 shows the results summarized pictorially. It is clear that national policies in Malawi do not currently support consumer behavior, including food acquisition, preparation, meal practices, and storage. In addition, for several other elements of the food system, the national policies in Malawi are not comprehensive. Tables 3.3 also summarize the current policies related to food system challenges, highlight potential gaps or conflicting policies, and identify potential policy implications.

Malawi's food systems policy landscape is guided by global and regional declarations as well as the national vision and development plans. The national development plans and policies generally have strong coverage of most elements of the food system, focusing heavily on resilience, food security, and nutrition given current poverty levels and increasing frequency of droughts. However, the key challenge lies with ensuring availability of sufficient financing and the right prioritization of programs and actions to deliver the highest multiplier effect.

Within the current policy landscape, there are opportunities for more alignment to deal with potential trade-offs as well as to realize synergies on some of Malawi's key challenges in its food system. There are also opportunities to realize more synergies between programs by streamlining financing, including funding from development partners.

FIGURE 3.3—NATIONAL POLICY GAPS RELEVANT FOR FOOD SYSTEMS IN MALAWI



Source: Rockefeller Foundation et al. (2021a).

Note: National plans broadly cover all components of food systems, with some elements around food supply chains and environments not addressed.

TABLE 3.3—CURRENT POLICIES, GAPS, AND IMPLICATIONS

Key challenges	Current policies related to challenge	Potential gaps or conflicting policies	Potential implications
Diet quality and nutrition security Limited consumption of nutrient rich foods such as legumes, fruits, vegetables, and animal-source foods, resulting in high rate of undernourishment	• NAIP: Input subsidies focused on maize and vegetable seeds • NAIP and Energy: Investment in cold chain for nutrient rich foods • Nutrition and NAIP: Nutrition-sensitive interventions, promoting dietary diversity, micronutrient supplementation • National export strategy: Export of nutrient-rich fruits and vegetables • Education: Promotion of school feeding • Trade: Promotion of commercial agriculture for export of food	• Subsidies with focus on maize enable continuity of current system dynamics • Limited prioritization of investments resulting in incomplete implementation of programs, despite NAIP, • Limited consumer behavior change limiting local consumption and increasing focus on exports	• Tailor input subsidy programs to increase diversity and availability of nutrient-rich foods • Prioritize investments based on return on investment • Ramp up education of nutrition-sensitive consumption and trade • Explore means to reduce cost of nutritious diet and create markets for nutrient rich foods • Increase value-addition/ processing of nutrient-rich foods (based on local demand)
Livelihood equity Majority of population living below poverty line, women-led households typically worse off, resulting in high undernourishment rate and consumption of cheaper, less nutritious meals	Resilience: • Cash transfer programs for lowest income category • Training, employment, and land ownership for women and youth • Gender and social welfare: Access to microfinance • NAIP: Access to market price information	• Blanket cash transfer program that improves poor targeting • Limited systems approach to improve livelihoods (e.g., input subsidies and training have limited effect without access to market) • Funding shortages often mean social assistance programs are not implemented	• Target cash transfer program to those that most need it • Scale up programs such as school feeding to cover entire population • Strengthen existing co-ops and enable development of market linkages, financing access, and so forth
Environmental resilience Frequent exposure to droughts and reliance on maize, a highly drought susceptible crops, resulting in high levels of food insecurity	Resilience: • Encourage crop diversification • Sustainable irrigation development and water supply systems • Early warning and response systems • Climate change learning: • Ensure forest cover of 10% on 80% of cropland	• Provide input subsidies without access to water (storage infrastructure) during drought period • Increased input utilization may risk ability to ensure sustainable production	• Invest in drought- and flood-resistant varieties and crops • Adopt predictive modeling and early warning system to prepare long-term • Explore cloud seeding to reduce rainfall extremes • Explore adoption of agro-forestry • Construct check dams, gully plugs, and terracing to avoid run-off
Infrastructure capacity Underdeveloped supply chain infrastructure with limited private-sector investment, particularly for nutrient rich foods, driving high food loss and waste	• NAIP: Improve domestic infrastructure including feeder roads • NAIP: Rural cold storage facilities • Energy: Rural electrification • NAIP: Post-harvest management • Trade: Improve market linkages	• Facilitate private sector investment/PPPs not addressed • Limited rural grid electricity development • Focus on external markets linkages over more local supply chains may impact local availability	• Explore reduction in tariff and non-tariff barriers • Explore development of (renewable energy) mini-grids for post-harvest management and cold chain management • Opportunity to leverage existing skills to build out agribusiness
Agricultural productivity Relatively low yield of crops, due to reliance on rain-fed agriculture, simple farming techniques on small-holder plots, and limited access to credit and insurance	• NAIP: Provision of subsidized inputs (e.g., fertilizer) • NAIP: Irrigated agriculture and water storage investment and mechanization • Reforestation strategy: Ensure forest cover of 10% on 80% of cropland	• Provision of subsidies without training on application of inputs and local conditions may not improve yields • Limited punitive measures to ensure quality of inputs • Timely supply of inputs to ensure successful harvest not addressed	• Provide localized understanding of soil and seasonal and climatic conditions • Explore farmer education on input application • Focus subsidies and investments on most productive farmers • Explore opportunity to provide consistent water supply to farms

Source: Rockefeller Foundation et al. (2021a).

Note: NAIP= national agriculture investment plans; PPP= public-private partnership.

Conclusions and Policy Implications

The food system diagnostics analysis underlined a number of key concerns and challenges for Malawi's food system. Policies have tended to emphasize food availability (production) without directing equal effort toward supporting other food system components. The alignment of national policies and strategies to international protocols, declarations, and visions is important for the achievement of national targets. This enhances the country's capacity to mobilize resources from development partners.

The subsidy program is critical but does not guarantee the availability and affordability of food to ensure dietary diversity. The existing AIP subsidy program primarily focuses on maize, with less emphasis on legumes and livestock production on smallholder farms. Given the small plots and the high levels of land degradation, it is doubtful that Malawi can be assured of production and dietary diversity under these circumstances.

Informal markets have no standards for quality and safety, leading to the consumption of unhealthy foods. Food waste—especially for fruits and vegetables—is high in Malawi and other African countries south of the Sahara. At the same time, the production and productivity of most crops are low. In addition, there is low processing of agricultural products in Malawi. Better and structured markets would promote the growth of agro-processing and the development of efficient and inclusive agricultural value chains that ensure competitive and fair pricing of agricultural products.

Based on the food system diagnostics undertaken for Malawi, recommended possible policy interventions include the following:

Pursue a food systems approach in policymaking

- Restructure to create an integrated food system with clear delineation of initiatives, policies, and other activities among all ministries, subdirectorates, and departments. Strong cooperation and coordination across ministries around food systems is crucial to ensuring ownership and increasing efficiency and effectiveness.

Invest in improved food safety

- Increase research, infrastructure, staffing, and other resources to increase capacity to proactively identify and prevent incidence of foodborne diseases.
- Adopt a risk-based approach to food safety, especially in the short term as capacity is being increased. This could involve prioritizing high-risk areas contributing to foodborne disease and determining frequency of inspection based on health risk.
- Increase commercial farming and ensure safety measures are installed to reduce disease vulnerability.

Reduce food loss and waste

- Invest in safe community food storage facilities; electricity, processing, and other infrastructure; and structured markets to limit food contamination, loss, and waste.
- Provide messaging on how to store and prepare produce to extend its shelf-life at home and in restaurants; invest in standards for avoiding food loss and waste for the retail sector.

Improve nutrition and food security

- Ensure adequate access to macro- and micronutrients by encouraging production of nutrient-rich and biofortified foods for the domestic market (such as by providing or increasing farming input subsidies for livestock, legumes, fruits, and other products through AIP).
- Invest in electricity, logistics, and other infrastructure to increase production, storage, and distribution of perishable food; develop alternative sources of proteins that have limited impacts on the environment (such as fish from Lake Malawi and Lake Chilwa).
- Encourage consumption of nutrient-rich food through nutrition education/awareness campaigns and provision of nutrient-rich foods to vulnerable populations through alternative channels such as school feeding programs.
- Promote healthy diets through potential increases in taxes on unhealthy foods such as sugar-sweetened beverages and salty snacks; sponsor information campaigns promoting healthy diets and physical activity for urban populations; and strengthen guidelines on food marketing and messaging.
- Place as much emphasis on food affordability and access as on food availability. Move toward a market-oriented and specialized agricultural sector that can meet the healthy food needs of the population outside of the agricultural sector.

- Promote integrated soil fertility management to improve soil health and mitigate negative impacts of land degradation on the affordability and availability of healthy foods.

Promote regional market integration

- Enact policies supporting integration of traders into regional and international markets to raise local standards for quality and safety of foods as well as to improve farmer incomes.

Acknowledgments:

We owe gratitude to the Ministry of Agriculture and Food Security in Malawi, the Malawi National Planning Commission, AKADEMIYA2063, Alliance for a Green Revolution in Africa, African Population & Health Research Center, Boston Consulting Group, International Development Research Center, International Food Policy Research Institute, Rockefeller Foundation, Tony Blair Institute, Wageningen University, and the World Food Programme for collaborating on the Food System Transformative Integrated Policy initiative which led to this work.