CHAPTER 6

National Food Systems
Inclusive Transformation for Healthier Diets

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KEY FINDINGS

- The rapid transformation of national food systems offers new opportunities for inclusion of poor and marginalized people, potentially improving dietary diversity, food safety, and quality.
- As food systems transform across the spectrum from traditional to modern, government policy goals need to shift from a focus on food security to healthy, balanced diets.
- National food system frameworks are useful tools for looking at the drivers and components of these systems, identifying data gaps, and finding promising entry points for actions to increase inclusion and improve nutrition outcomes.
- Approaches to food system transformation must be country specific, as each country's food system is unique and countries face different opportunities and trade-offs for inclusiveness at different stages of transformation.

RECOMMENDATIONS

- Reverse traditional thinking about food systems by starting from the consumer, focusing on diets and consumer demand. Better collection of data on changing diets, especially consumption of processed foods, and development of nationally appropriate dietary guidelines can inform strategies to address rising obesity and persistent malnutrition.
- Combine technological innovations, institutional capacity, and infrastructure investments—such as use of information and communications technology, food quality certification, and cold chains—to catalyze positive systemic change at the national level.
- Continually adapt policies as food systems evolve to ensure they promote healthy diets, create an enabling environment for positive private sector contributions to making food systems inclusive, and manage trade-offs among different policy goals.

National food systems in low- and middle-income countries (LMICs) are transforming rapidly from traditional to modern. This is part of a larger story of rural transformation, urbanization, and development that can offer new opportunities for inclusion of poor and marginalized people. In addition to creating employment and income-generating opportunities, transformation can also support improvements in nutrition that are associated with long-term impacts on health, cognitive capacity, educational attainment, income, and development. The tools and policies for making food system value chains more inclusive have been described in the previous chapters, as have the particular obstacles and opportunities facing smallholders, women, youth, and refugees. Here we identify some of the challenges of ensuring that national food system transformations contribute to better diets and nutrition outcomes for all.

As countries urbanize and incomes rise, consumers begin to demand more diverse, convenient, and safe foods. Changes in food demand can drive changes throughout a food system, ranging from farmers to supply chains, markets, and households. Yet poverty, geographic isolation, gender, and other inequalities can exclude people from new opportunities created by national food system transformations and can make healthy food difficult to access. These failures are evident globally in a range of indicators: disappointingly slow reductions in rates of child stunting, persistent hunger, stubbornly high prevalence of micronutrient deficiencies, and rapidly increasing rates of overweight and obesity. Many countries are dealing with several of these, and often all at once. Policymakers need to know what policies, investments, and actions they can take to ensure food systems transform in a healthy, sustainable, and equitable way.

Informed policymaking will require a better understanding of how food systems affect nutrition, what entry points and policies are most effective, and what trade-offs must be made. This chapter reviews the framework and findings of the Food Systems for Healthier Diets research program under the CGIAR

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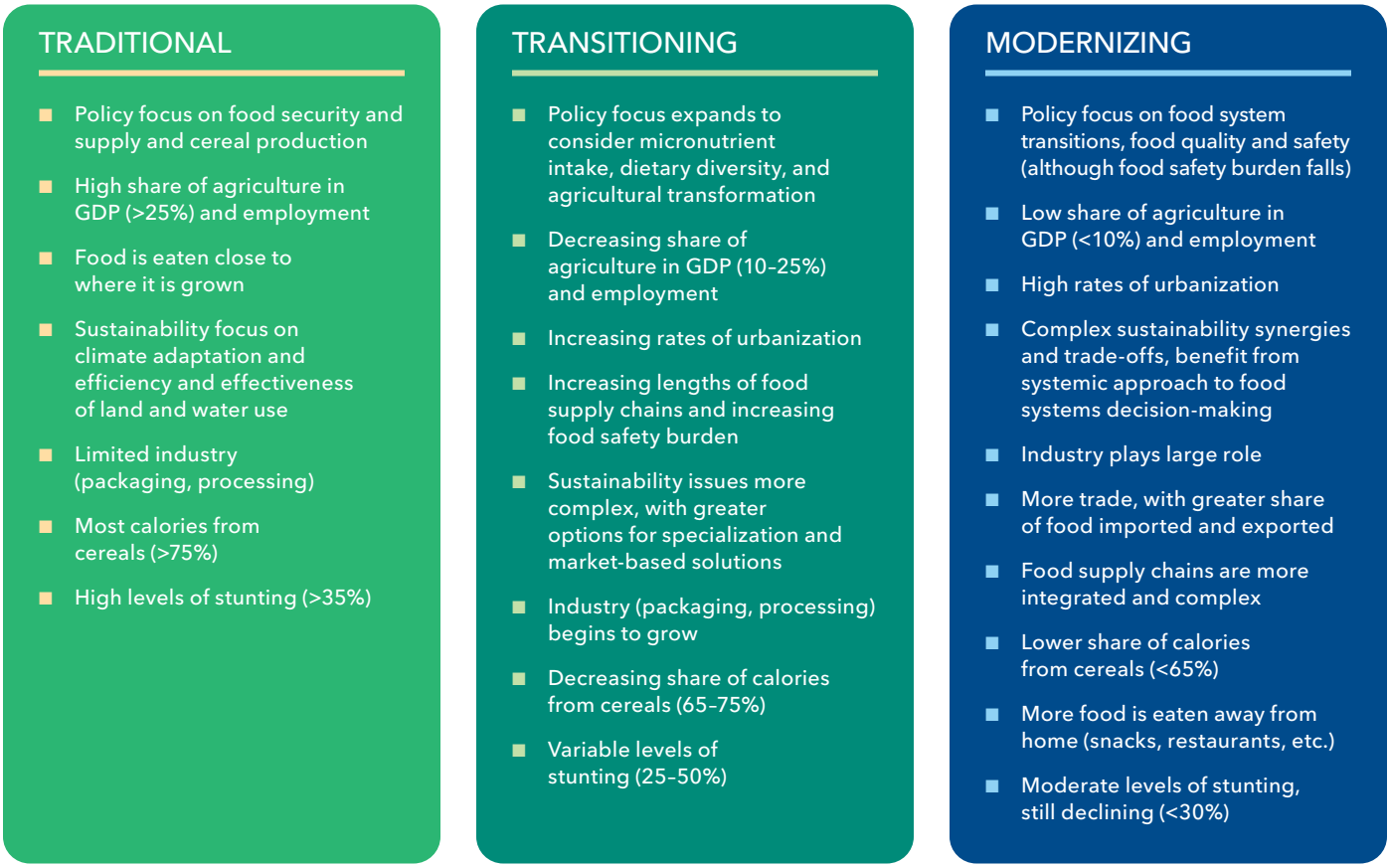
FIGURE 1 Stages of food system transformation



Research Program on Agriculture for Nutrition and Health (A4NH).[1] This program is engaging with national-level development practitioners, entrepreneurs, and policymakers to develop evidence on national food system transformation in four focus countries—Nigeria, Ethiopia, Bangladesh, and Viet Nam—and on subnational food systems in India, in order to assess possible system interventions and enabling actions to scale and anchor desired food system outcomes.

A NATIONAL PERSPECTIVE ON FOOD SYSTEM TRANSFORMATION

Food system transformation is now central to the development strategies of most LMICs. This emphasis reflects the need to meet growing domestic and global demand for food resulting from growing populations and rising incomes. It also reflects the recognized potential for food system transformation, both to provide more and better employment and value addition beyond primary agriculture *and* to improve nutrition through better access to healthy diets. But few countries have developed specific plans for food system transformation or engaged the coalition of public and private organizations necessary to implement them.

Country-specific approaches are needed because each country's food system is unique, reflecting national natural resources, market access, and sociocultural traditions as well as the country's stage of economic transformation. We categorize food system transformation into four stages—agrarian or traditional, transitioning, modernizing, and modern.[2] The first three stages predominate in LMICs. Figure 1 describes the characteristics common to each of these stages.

As systems evolve from one stage to the next within any given country, policies need to change and adapt. Designing appropriate investments, policies, and regulations to include, enable, and incentivize food system

actors is particularly challenging when the food system itself and strategic priorities are rapidly evolving. In LMICs, government policies and goals commonly progress from an initial food security focus (having enough to eat) in traditional systems, to basic diet adequacy (ensuring adequate micronutrient intake) as countries transition, and then to healthier balanced diets (access to safe, healthy, and diverse foods) as they modernize. Managing these transitions to ensure greater inclusion and better nutrition outcomes has potential to positively change the trajectory of health, equity, and sustainability.

The focus countries of our research program have important differences but share key policy objectives that will contribute to improvements in nutrition for all. These countries all aim to enable value addition beyond the farm for greater economic growth and jobs, which will raise incomes for many. They also aim to diversify food supply chains to increase the availability of nutrient-dense foods, such as fruits, vegetables, and animal-sourced foods, and to limit consumption of less healthy foods high in sugar, fats, and salt in order to improve nutrition outcomes. Depending on the country context, different approaches will be more effective in reaching these goals.

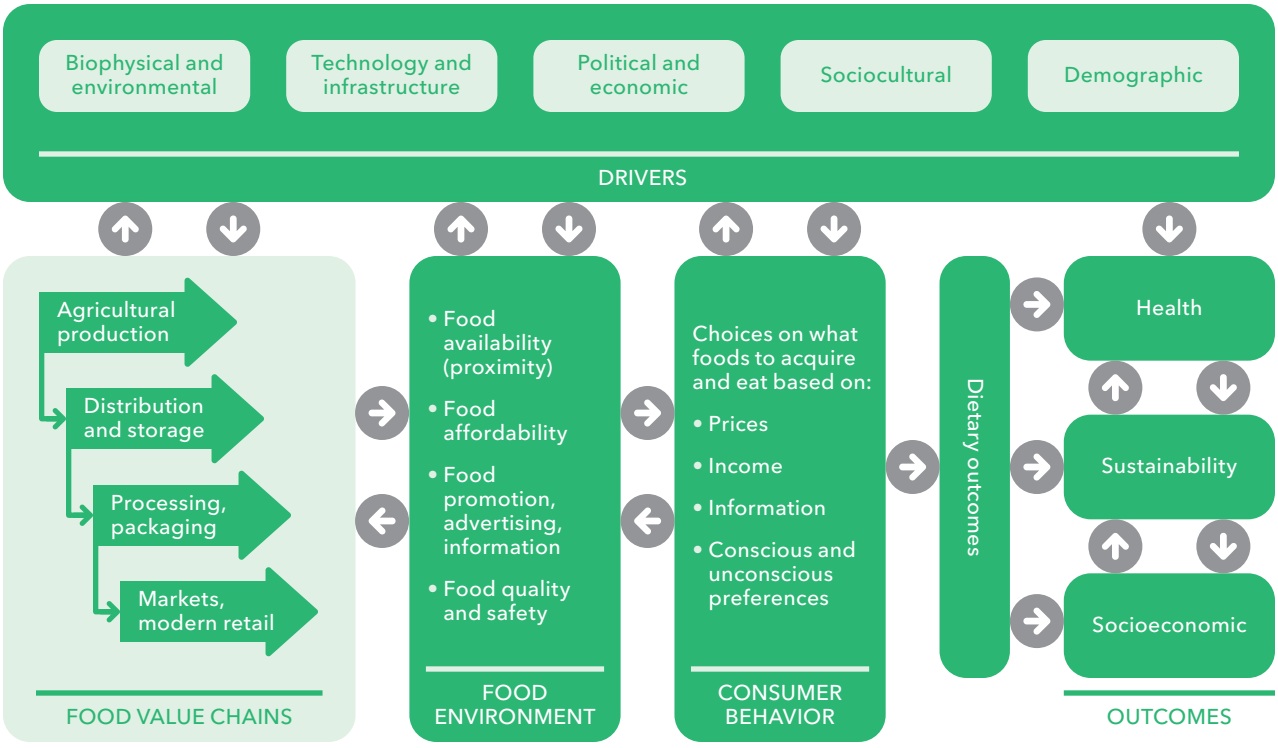
FOOD SYSTEM FRAMEWORKS

Food system frameworks are useful tools for assessing how food systems are contributing to reducing malnutrition in all its forms, and whether they are doing so in an equitable and sustainable way. We use a simplified version of a widely accepted national food system framework to help carry out a three-step analysis that will allow national actors to build a food system strategy to meet their food system and nutrition objectives.[3] These steps are:

1. Assess the country's development context, particularly demand drivers shaping food systems and how these will change in 10 and 20 years.
2. Understand what indicators are available to assess health, sustainability, and equity outcomes.
3. Identify priority areas for action for the food supply, food environment, and consumer behavior.

Figure 2 depicts our framework's key elements: a broad set of *drivers* that influence three food system *components*—namely, value chains, the food

FIGURE 2 Simplified framework for food system analysis



Source: Adapted, with permission, from HLPE (High-Level Panel of Experts), *Nutrition and Food Systems: A Report by the High-Level Panel of Experts on Food Security and Nutrition* (Rome: 2017).

environment, and consumer behavior. Together these determine socioeconomic, health, and sustainability *outcomes*. Central to this framework is the understanding that food systems are demand-led. The choices people make about diets are shaped by prices, income, information, and marketing and by individual needs, preferences, and constraints—and these choices determine nutrition and health outcomes. The dynamics of the food system also shape sustainability and equity outcomes. Looking at the drivers and food system components for a particular country through this framework can help policymakers identify policy needs and promising leverage points for action. It can also highlight systemic trade-offs, interactions, and synergies in achieving nutrition, sustainability, and socioeconomic outcomes.

For most countries at the traditional or transitioning stages of food system transformation, critical information gaps exist regarding food system impacts and outcomes. This framework provides a useful way to visualize the availability of relevant indicators and data gaps (Box 1).

INCLUSION STRATEGIES FOR FOOD SYSTEM TRANSFORMATION FOR HEALTHIER DIETS

Four national strategies for inclusive change in food systems offer promise for improving nutrition among disadvantaged groups, including poor populations and other disempowered social groups, such as women and refugees. In discussing each strategy, we look at country experiences, drawing heavily on research in the four focus countries and Indian states. At the different stages of transformation—traditional, transitioning, and modernizing—different approaches will be needed to implement these strategies. These evolving policy needs are summarized in Table 1.

REVERSE THINKING: *Put diets first*

Traditional and transitioning countries usually focus on increasing the food supply, but not on consumer behavior or food environments.[4] Reversing this thinking by starting from the consumer demand end of a food system can help address growing problems associated with unhealthy diets, including the rise in consumption of highly processed foods, that may disproportionately affect children and the poor.

One entry point is to develop food-based dietary guidelines suitable to the national context. National dietary guidelines must translate existing scientific knowledge on the links between foods, diets, and health outcomes into local food habits and dietary patterns, food availability, and costs. In Ethiopia, a technical working group, composed of representatives from government ministries, NGOs, academia, and civic organizations, is using a consultative process to develop national guidelines based on scientific evidence and local conditions and preferences. These guidelines can be used by consumers to inform food choices and by policymakers for formulating policies and strategies. Development of these guidelines has stimulated discussion of diet and nutrition issues. The process has benefited from strong government interest, and Ethiopia's experiences are being shared with other countries.[5] In parallel, Ethiopia is linking nutrition and equity through the Seqota Declaration program. This multisectoral program is combining agrifood, health, water and sanitation interventions, and social protection programs in districts where childhood stunting levels are high. Together these efforts are moving Ethiopia beyond an earlier and singular focus on food security toward a broader food system and nutrition approach.

As countries begin to shift away from traditional diets, foods eaten away from home (snack, street, and restaurant foods) are consumed with increasing frequency, often with deleterious nutrition and health impacts.[6] For example, in India snack foods are aggressively marketed and widely consumed by children and adolescents, and obesity problems and associated diabetes and cardiovascular diseases are rising at an alarming rate (Box 2).[7] Yet the impacts are not consistent across countries: the rise in overweight and obesity in South Asia and Africa south of the Sahara has been greater in wealthier households and urban areas, while poorer and more rural households have faced the greatest increases in other LMICs.[8]

Capturing information on food consumption outside the home and incorporating it into dietary guidelines and policy actions poses a challenge for traditional and transitioning-stage countries. Current surveys of food consumption expenditures are not designed to track these purchases, and the lack of data is a major concern for countries that need to

BOX 1 INDICATORS FOR ASSESSING FOOD SYSTEMS

Inge Brouwer (Wageningen University & Research) and Alan de Brauw (IFPRI)

As part of the UN Sustainable Development Goals (SDG) process, all countries must collect data for SDG indicators. For assessment of food systems, the SDG indicators need to be supplemented with other available data. Table B1 illustrates how the food system framework can be used to look at the current state of publicly available information for national and subnational food system assessment and decision-making across countries. In those African countries where food systems are traditional or transitioning, most policy emphasis is on food supply, and the availability of indicators reflects this emphasis. Nigeria and Ethiopia, for example, focus on agricultural transformation, reflected in more indicators for agricultural productivity. Most countries have data and indicators for their relatively small processing and packaging industries, but information on logistics, storage, and marketing is quite limited, as are data on food environments. Data availability does not always indicate stage of development, however: Bangladesh has substantial data on food environments while, surprisingly, Viet Nam does not–recent innovations and investments in Viet Nam are not yet reflected in publicly available data. Generally, data on national food systems reflect the persistent emphasis on production and do not necessarily represent dynamic change in the system. Reorienting thinking and data collection toward determinants of food demand, especially the food environment component, is critical to managing the diet transition.

TABLE B1 Information and data available to assess food system indicators in Bangladesh, Ethiopia, Nigeria, and Viet Nam

	INDICATORS AVAILABLE ● Substantial ● Some ● Few or none			
	Bangladesh	**Ethiopia**	**Nigeria**	**Viet Nam**
Food value chains				
Agricultural production	●	●	●	●
Distribution and storage	●	●	●	●
Processing, packaging	●	●	●	●
Markets, modern retail	●	●	●	●
Food environment	●	●	●	●
Consumer behavior	●	●	●	●
Drivers				
Biophysical and environmental	●	●	●	●
Technology and infrastructure	●	●	●	●
Political and economic	●	●	●	●
Demographic	●	●	●	●
Outcomes				
Dietary and health	●	●	●	●
Sustainability	●	●	●	●
Socioeconomic	●	●	●	●

TABLE 1 Examples of inclusive policies and actions, by type and transformation stage

TYPE OF REFORM	STAGE OF FOOD SYSTEM TRANSFORMATION		
	TRADITIONAL	TRANSITIONING	MODERNIZING
REVERSE THINKING: PUT DIETS FIRST	Promote production of nutrient-dense foods	Nutrition education or information campaigns around healthy eating	Require packaging labels (or QR codes) and labeling of foods eaten away from home
FOOD SYSTEM INNOVATION (TECHNOLOGY, INSTITUTIONS, AND INFRASTRUCTURE)	Biofortification; contractual innovations in nutrient-dense food production	Food quality certification; cold chain innovations; technological agricultural extension	Infrastructure for logistics to enhance efficiency and traceability
ENABLING POLICY ENVIRONMENT (PRIVATE SECTOR, CEREAL SUPPORT REFORMS, REGULATION)	Food fortification in processing; combine social protection with dissemination of information on diets	Develop food-based dietary guidelines; implement soda or unhealthy food taxes; purchase of nutrient-dense foods by schools and institutions	Healthy food subsidies; food safety regulations
ENSURING INCLUSIVITY OF INNOVATIONS AND REFORMS	Target smallholders with biofortification; ensure contract terms are incentive-compatible for all parties; include farmer groups and extension in contracts; understand impacts of any regulation and innovation for gender or vulnerable groups	Ensure that poor farmers trust quality certification, whether done by government or third party; target tax revenue for health among poor; technology penetration to poor necessary for extension to be effective	Provide vouchers for nutrient-dense foods among poor; consider effects of regulations on food costs among poor; require labels (or QR codes) on all packaged foods

BOX 2 SNACK FOODS AND IMPLICATIONS FOR CHILDREN AND ADOLESCENTS IN PUNE, INDIA

Anjali Ganpule (Gokhale Research Institute), Bhushana Karandikar (Gokhale Research Institute), Avinash Kishore (IFPRI), Devesh Roy (IFPRI), and Manika Sharma (IFPRI)

In India, traditional diets and eating habits are changing in response to rising incomes, and snack foods have become an important part of the food environment. To investigate eating outside the home, we conducted a cross-sectional study of 1,500 people along a rural–urban transect in Pune, Maharashtra State. Snack food consumption was common in the country's transitioning and modernizing food systems. Children ate snack foods 2–3 times per day; adolescents ate snack food 1–2 times per days. Among adults, urban residents snacked more.

Snacking trends in Pune mirror the increase in processed food consumption in other transitioning and modernizing food systems. People's snack food choices were largely driven by price and taste, with little attention paid to ingredient labels, and snacks high in sugar, salt, and low-quality fat were most popular. Children and urban consumers were more likely than rural adults to be influenced by brand advertising.

Our assessment of weekly food consumption showed that unhealthy and cheap snack foods are crowding out healthier foods, including pulses, coarse grains, and vegetables. Given the obesity epidemic (in this survey, more than 50 percent of urban adults were obese and in rural areas 29 percent of women were obese) and the high rate of associated noncommunicable diseases in India, efforts to encourage healthier eating, such as the Eat Right India campaign, are increasingly important to ensure a healthy food environment for children and adolescents.

Note: For more information, see A. Ganpule-Rao, A., D. Roy, B. Karandikar, C. Yajnik, and E. Rush, "Food Access and Nutritional Status of Rural Adolescents in India: Pune Maternal Nutrition Study," *American Journal of Preventive Medicine* (forthcoming, 2020).

manage the increasing consumption of unhealthy snack foods. Globally, little progress has been made in slowing the rise of obesity, due to lack of concern from consumers, resistance from food companies, and limited incentives for national political leadership on the issue.[9] While experience with policies, regulations, and interventions to fight obesity is growing, including in LMICs, there has not been a systematic way of cataloging this information.[10] Some countries at the modernizing stage of food system transformation, notably Chile and Mexico, have taken actions such as nutrition labeling and soda taxes, respectively. These innovations could add to the tool kit for traditional and transitioning countries to ensure food system transformation doesn't lead to unhealthy diets and worsening nutrition.[11]

FOOD SYSTEM INNOVATION:
Combine technology, institutional capacity, and infrastructure

As a country begins to shift out of a traditional food system, innovations in technology, institutions, and infrastructure can work together to contribute to positive, inclusive systemic change. For food supply transformation for healthier diets, combinations of technology, institutional change, and enabling policies have been critical in areas such as rice production in Bangladesh, labeling of foods in Viet Nam, and the transformation of India's dairy industry. In the Indian case, dairy cooperatives began by helping smallholders with feed, loans, and other inputs as well as links to markets for their perishable milk. Over time, the cooperatives developed capacity for production of cheese, yogurt, and other high-value products, which has opened up new opportunities.

Technological innovations that drive agricultural transformation can be adapted for broader impact on food system performance for nutrition. Information and communications technology (ICT) innovations are most successful when they fit farmers' needs and when farmers' trust in the system supports a critical mass of users, allowing for network effects. Most notably, ICTs show promise for increasing inclusion: ICTs can improve production and improve access to rural services, credit, and market information (see Chapter 2).[12] They can also be adapted to trace food from farm to consumer, helping assure consumers of food safety and quality, which contribute to healthy diets.

In our focus countries, two *institutional-strengthening approaches* show promise for reducing common inefficiencies in the production and supply of nutrient-dense, perishable foods such as fresh fruits and vegetables and animal-sourced foods. First, farmers' organizations can act as aggregators for knowledge and help link small-scale farmers with both input and output markets (see Chapter 2), as in the Indian dairy example. Second, quality certification can allow smallholders to charge higher prices for products that meet consumers' demand for quality, such as certified organic foods, or other standards, such as size and safety.[13] Where governments are considered reliable, they can provide certification; otherwise, third parties can provide this service. Even assurance that goods can be tested by third parties can improve prices paid to smallholders.[14]

Infrastructure investments can also contribute to inclusive growth in food systems and diversification of the food supply—both healthy and unhealthy. Roads are known to have broad general effects on inclusiveness by facilitating linkages: trunk, or major, roads have been shown to increase agricultural trade and income; however, evidence on trade and income impacts of feeder roads is less clear.[15] Cold chains are critical for expanding markets for smallholders' high-value perishable products and for delivering these nutritious goods to urban consumers. Investment in cold chains has largely been led by the private sector.[16] Several cold chain innovations are being developed, such as the CoolBot technology, which uses standard air-conditioning equipment to create a cold storage space and has low fixed costs, and the Dearman engine, which uses liquid air as fuel to cool spaces such as trucks but requires substantial upfront investment. While both of these technologies can potentially deliver more perishable goods to urban areas at lower costs, rigorous assessment of their nutrition and equity impacts is needed.

ENABLING POLICY ENVIRONMENT:
Let markets work for inclusion and healthier diets for all

Providing an enabling environment for effective and inclusive food systems is challenging, and policies often produce unintended consequences, both positive and negative. Developing countries must be able to adapt and change policies to reflect their changing circumstances and must design food

system policies with a view to likely trade-offs to balance health, sustainability, and equity outcomes for overall welfare.

As countries transition toward modern food systems, they must manage the shift in policy objectives from food security to food quality. In traditional food systems, domestic cereal production for food security dominates national concerns. Since the 1970s, a policy emphasis on increasing production of staple foods has contributed to the global decline in cereal prices in real terms, relative to much higher prices for nutrient-dense foods, such as vegetables and fruits, pulses, and animal-sourced foods.[17] In many LMICs, the absolute price of nutrient-dense foods is significantly greater than in high-income countries.[18]

A range of policies and investments that drive the relative prices of staple foods have shaped diets in many countries. Markets for food can be distorted by public policies such as subsidies, as was the case with subsidized water and energy in India and fertilizer in Malawi; investment in research and development, as for maize in Malawi and Zambia; import tariffs, as for rice in Nigeria; and bans and export restrictions in many countries. These policy-induced distortions can have positive or negative impacts on diets, depending on the national context. In India, keeping the cost of cereals low relative to noncereals has contributed to the proliferation of cheap snack foods.[19] But in Bangladesh, the stable supply of low-cost rice, combined with economic growth, has allowed the poor to increase consumption of nutrient-rich fish and vegetables.[20] The challenge is to make policies inclusive and forward-looking—moving from a focus on food security to a focus on a diverse food supply and postfarm food processing, logistics, and market investments—as food systems transform and national needs change.

Small and medium-sized enterprises (SMEs) can play a vital role in making food systems more inclusive by creating jobs and linking rural and urban areas (see Chapter 2). Policies and regulations are particularly important in creating an enabling environment for inclusive private sector food system activities. In our focus countries, private sector actors at all stages of the food supply chain are largely SMEs, including for-profit and social enterprises, cooperatives, and farmer-producer organizations. SMEs often lack essential technical skills and business experience, and because of their small size are unable to bear much risk, making scaling up these operations a critical challenge.[21]

In Africa and Asia, there is considerable interest in fostering private sector involvement in food system transformation. Policymakers embrace the concept of food system transformation because of the potential for increasing inclusive growth, benefiting women (see Chapter 4) and youth (see Chapter 3) particularly. The agriculture and food sectors have the potential to provide jobs for youth, if supported with increased investment and conducive legal and policy environments.[22] Agribusiness SMEs—that is, farming plus all the industries and services along the food value chain—could generate opportunities for youth in food processing, wholesaling, and retailing.[23] Given the demographic change in Africa, where the "youth bulge" raises both opportunities and challenges, African countries are particularly keen on boosting youth employment through food system development.

Developing appropriate policies and regulations to balance the critical food system outcomes—that is, managing trade-offs—is challenging in all countries. As food systems become more modern, demand increases for higher food quality and for food safety, prompting governments to adopt stricter food standards. But often in LMICs, these policies and regulations are too complex to be implemented or they disadvantage those less able to participate in modern value chains.[24] Among our four focus countries, the transformation of food systems has been most rapid in Viet Nam, which has been at the forefront of the debate over restrictive food safety standards required by export markets and supermarkets and the less stringent food safety regulations appropriate for local fresh food markets, where most poor people buy and sell foods (Box 3). The country is trying to manage trade-offs to ensure that food safety governance and regulation do not exclude the poor as sellers and buyers of fresh foods, while also promoting growth in higher-value domestic and export food markets. At present, a compromise allows informal markets to function while commercial food systems must meet more stringent quality and safety standards. Food labeling for nutrition and safety is now mandatory for the commercial food system in Viet Nam, and healthier foods are marked by a special label developed by an NGO.[25] This is part of a small but rapidly growing international body of experience in policies and regulations for mitigating obesity.[26]

BOX 3 MANAGING FOOD SAFETY GOVERNANCE IN VIET NAM

Hung Nguyen and Delia Randolph (International Livestock Research Institute)

The switch from "needing enough food to eat" to "needing safe food" is happening rapidly in Viet Nam. With more than 80 percent of food purchased in traditional "wet" markets, food safety management is an important issue. The poor, women, and children are the groups often exposed to food hazards from the more than 9,600 traditional markets (compared to 700 supermarkets) and many other informal markets across the country that supply most fresh, perishable foods. Finding appropriate ways to manage food safety for these markets without decreasing employment opportunities and access to fresh food for the poor is critical.

At the same time, Viet Nam is already a major exporter of high-value food (including seafood, vegetables, and rice), and its exporters are meeting the demanding requirements of US and European markets. Export value chains benefit from substantial private sector capacity, knowledge, and protocols for producing safe food, and people working in exports have substantial training and earn a notable premium.

The government is committed to establishing a single standard for both exports and domestic food to replace the lower standards that prevail in wet markets. But the implementation of food safety management in the large system of informal markets is weak and marked by poor compliance in production, processing, and marketing. And when food scandals inevitably occur, public mistrust and miscommunication about food safety risks are amplified through social media. During this transition period—when value chains for supermarkets are long and complex and those for wet markets are local and simple—food systems are evolving toward developing globally recognized quality and safety standards.

Improving domestic food safety in Viet Nam will require capacity building, effective verification of safety, and incentives for value-chain actors, including rewards for safe food and penalties for unsafe food. Fortunately, the 2011 Food Safety Law provides a modern framework for Viet Nam's food safety management system. Its implementation will require increased capacity across government levels to apply a risk-based approach for both export and domestic food markets, and will allow lessons from the export sector to be shared for the benefit of the domestic sector.

Note: For more information, see H. Nguyen-Viet, T. T. Tuyet-Hanh, F. Unger, S. Dang-Xuan, and D. Grace, "Food Safety in Vietnam: Where We Are At and What We Can Learn from International Experiences," *Infectious Diseases of Poverty* 6, no. 1 (2017): 39; World Bank, "Food Safety Risk Management in Vietnam: Challenges and Opportunities," Technical working paper (World Bank, Hanoi, 2017).

SOCIAL DEVELOPMENT POLICIES:
Including people and places left behind

Policies tailored to national conditions must also take account of the people and places left behind by transitioning and modernizing food systems. Many national and subnational food system interventions have not been sufficiently inclusive nor contributed sufficiently to equity. In this section, we describe how countries have implemented supplemental social development policies and actions intended to complement and enhance inclusive food system transformation.

Research and policy advice are paying greater attention to those excluded or disadvantaged by changing food systems in terms of access to food, food quality, and the other benefits of more modern food systems. Poverty, nutrition, and health outcomes have been shown to be related to social groupings (such as tribe or caste), climate emergencies, natural resource degradation, and conflicts (see Chapter 5).[27] In addition, understanding of the impact of gender roles and gender empowerment on inclusion and nutrition is expanding (see Chapter 4).[28] Given a growing body of evidence on poor food system outcomes, interest is growing in more radical approaches to supporting groups being left behind.[29]

In Ethiopia, for example, interventions to increase agricultural productivity supplemented by social development actions to improve food security and nutrition for groups left behind have helped reduce food insecurity across both the country's productive agricultural zones and its poor drought-prone zones (Box 4). In India, deliberate efforts have been made to link nutrition and inclusive growth in lagging districts, supported and incentivized with a unique outcome-oriented governance approach (Box 5). And in Malawi, the positive nutritional impact of both food transfers during the lean season and behavior change communication to support dietary diversity suggest that combining the two approaches could boost healthy diets for the disadvantaged (Box 6).

BOX 4 ETHIOPIA SUPPLEMENTS GROWTH PROGRAM WITH SOCIAL SAFETY NET

Kalle Hirvonen (IFPRI) and John Hoddinott (Cornell University)

Agricultural output in Ethiopia has more than doubled over the past decade, but the spatial distribution of gains remains highly uneven. While the western highlands enjoy near-optimal climatic conditions for agricultural production, the eastern region is subject to frequent droughts, which leave its population chronically food insecure.

The government of Ethiopia, together with a consortium of international donors, provides targeted investments appropriate to these two different areas. Through the Agriculture Growth Program (AGP), the high-potential areas receive support to improve agricultural productivity and market performance of crop and livestock value chains, allowing the region's smallholders to take advantage of its natural resources and market connections. The AGP currently covers 157 districts and 1.3 million smallholder farmers. Complementing it, the Productive Safety Net Program (PSNP) provides transfers to address chronic food insecurity in drought-prone areas. The program is currently implemented in more than 300 districts, with more than 8 million beneficiaries, making it one of the largest safety net programs in Africa. Between 2006 and 2014, food security improved considerably among households that took part in the public works component of the PSNP, and about 80 percent of this improvement can be attributed to the program. Evidence showing limited improvements to child nutritional status led to a redesign of the program in 2014–2015 to incorporate nutrition-sensitive components that combine poverty reduction, food security, and nutritional benefits. In addition, efforts to link the PSNP to interventions aimed at increasing agricultural output have led to increased fertilizer use and agricultural investment in PSNP districts.

Source: This box draws on G. Berhane et al., *The Implementation of the Productive Safety Nets Programme, 2014: Highlands Outcomes Report (2015)* (Addis Ababa: Ethiopia Strategy Support Program, IFPRI, 2016); G. Berhane et al., "The Impact of Ethiopia's Productive Safety Net Programme on the Nutritional Status of Children: 2008–2012," ESSP Working Paper 99 (IFPRI and Ethiopian Development Research Institute, Washington, DC, and Addis Ababa, 2017); and J. Hoddinott et al., "The Impact of Ethiopia's Productive Safety Net Programme and Related Transfers on Agricultural Productivity," *Journal of African Economies* 21, no. 5 (2012): 761–786.

BOX 5 INDIA IMPLEMENTS NEW ASPIRATIONAL PROGRAM FOR DISTRICTS LEFT BEHIND

Purnima Menon (IFPRI)

The rate of childhood stunting has fallen over the past decade in India, from 48 to 38 percent. However, stunting and other nutrition, health, education, and economic outcomes vary widely across and within states, with tribal and remote areas being particularly vulnerable. In recognition of India's malnutrition challenges, the Indian government launched a National Nutrition Mission in early 2018, which is led, supported, and monitored nationally but financed and implemented by both national and state governments. Reflecting decentralization, the mission's strong district-level focus for nutrition reaches all districts in India. In the most vulnerable parts of the country, the mission is linked to another ambitious program, the Aspirational Districts Program.

The Aspirational Districts Program aims to change the narrative from "backward" districts to "aspirational" districts, with emphasis on using data and evidence to support and nudge districts to close gaps in implementation. By ranking districts on change in selected nutrition, health, education, and economic outcomes, the program aims to use competition and innovation to improve governance and program implementation in 112 districts.

What does this combined focus of the National Nutrition Mission and the Aspirational Districts Program mean for improving nutrition and inclusion outcomes? Initial observations suggest that the approach is indeed nudging districts to close gaps in governance, increase coverage of services, and generate greater interest in nutrition as a development issue. Given the multisectoral nature of the determinants of poor nutrition, a wide-scale, development-oriented effort like the Aspirational Districts Program has the potential to influence many of the known social determinants of poor nutrition outcomes—lack of education and health services, poverty, early marriage, and more—while also influencing the governance of core health and nutrition interventions. Although food system transformation is not a district-level mandate, districts will contribute to inclusive food system transformation through efforts to improve the functioning of India's public food programs.

Note: Drawn from work by the Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (POSHAN) program, with support from A4NH (see poshan.ifpri.info).

BOX 6 MALAWI ADOPTS A FOOD-SYSTEMS APPROACH TO IMPROVING DIETS AT THE COMMUNITY LEVEL

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Two recent impact evaluations in Malawi show how interventions at the community level can improve diet quality for the poor. In the first, findings suggest that during the lean season in food-insecure settings, where people face declines in food security, diet quality, and nutrition status, food transfers can have a protective effect on diets of low-income populations. Food transfers may also create demand that supports markets for nutritious foods. An evaluation of these food transfers found a 15 percent increase in children's dietary diversity scores, including foods not involved in the transfer, like vegetables and dairy. This suggests households used the increased resources to prioritize the consumption of nutritious foods. In a second evaluation, an integrated agriculture and nutrition intervention was shown, after 12 months, to increase nutritious food production, production diversity, and maternal knowledge, and to improve nutrition practices at the household level, the diets of preschoolers, and linear growth in their younger siblings.

This evidence highlights the potential to boost the dietary impact of Malawi's existing social protection interventions by enhancing public and private sector linkages across the food system. During the lean season, the effectiveness of food transfers could be maximized by systematically integrating intensive behavior change communication (BCC) to optimize household food choices, and public procurement programs like the existing school meals program could be modified to purchase leafy green vegetables, increasing demand in village markets where these foods are highly available but buyers are few. In the postharvest period, public procurement could continue, accompanied by BCC to improve food choices, thus providing a steady demand for food system transformation.

Source: Adapted from A. Gelli et al., "Value Chains to Improve Diets: Diagnostics to Support Intervention Design in Malawi," *Global Food Security* (forthcoming), https://doi.org/10.1016/j.gfs.2019.09.006; and A. Gelli et al., "Using a Community-Based Early Childhood Development Center as a Platform to Promote Production and Consumption Diversity Increases Children's Dietary Intake and Reduces Stunting in Malawi: A Cluster-Randomized Trial," *Journal of Nutrition* 148, no. 10 (2018): 1587–1597.

NEW OPPORTUNITIES AND CHALLENGES

National food systems are an important entry point for improving sustainability, health, and equity outcomes, and food system transformation is considered a key pillar of development in LMICs. Taking a food systems approach allows countries to consider a wide range of current challenges, from food security to climate change to diet transition, and opportunities, such as digital technology and building youth skills and entrepreneurial capacity, that are most relevant to their particular contexts. For LMICs, a food systems approach provides broad benefits in terms of designing effective, inclusive policies that can contribute to better nutrition outcomes. At present, a food systems approach is not proactively applied in most countries. This is reflected in policies that are supply-led rather than demand-led and which fail to anticipate food system transitions.

Inclusion and nutrition outcomes are closely linked. The burden of malnutrition is significantly greater among marginalized groups. National food system transformation strategies must be aggressively augmented with coordinated efforts to support groups left behind. In addition, we have reviewed some interesting examples of inclusion strategies at the district and community levels that can complement national food system transformation strategies. However, food system transformation strategies have not yet been systematically embraced in LMICs.[30] This is a critical moment for developing more systematic approaches to inclusive and healthy food systems—systems that encompass diet-led policies; build on synergies across technology, institutions, and infrastructure; and create an enabling policy environment to bolster the contribution of the private sector. Promoting national efforts to strengthen analysis and action can help to change the current trajectory in favor of healthier, more sustainable, and more equitable outcomes for all, for decades to come.