Agriculture’s vast potential to improve nutrition is just beginning to be tapped. New ideas, research, and initiatives developed over the past decade have created an opportunity for reimagining and redesigning agricultural and food systems for the benefit of nutrition. To support this transformation, Agriculture for Improved Nutrition: Seizing the Momentum reviews the latest findings, results from on-the-ground programs and interventions, and recent policy experiences from countries around the world that are bringing agriculture and nutrition closer together. Drawing on IFPRI’s own work and that of the growing agriculture–nutrition community, this book strengthens the evidence base for and expands our vision of how agriculture can contribute to nutrition. By highlighting both achievements and setbacks, Agriculture for Improved Nutrition seeks to inspire those who want to scale up successes that can transform food systems and improve the nutrition of billions of people.

Research and policy interest in a broad range of agriculture–nutrition linkages is fairly recent. For most of the 20th century, agricultural efforts focused on addressing food shortages with increased production. The nutrition community had a similarly myopic view. But since the early 2010s, agriculture–nutrition research has expanded, and numerous policy platforms and mechanisms have been established to address agriculture and nutrition both directly and indirectly—from the UN’s Sustainable Development Goals (SDGs), to regional initiatives such as the African Union’s Nutrition Capacity Development Process, to national policies that integrate agriculture into nutrition. This book focuses on the developments in agriculture and nutrition of the past decade, exploring research, policy, and programmatic advances to review what has changed and where work is needed.

Links between Agriculture and Nutrition

Agriculture delivers energy, macronutrients, and micronutrients essential for growth. Beyond that, what do we know about agriculture–nutrition pathways? Diversity in agricultural production is critical to nutrition: areas with higher agricultural diversity produce more nutrients. Since many farm households consume what they produce, production diversity generally increases dietary diversity among young children. For many farmers, agriculture is also a source of income that they can use to purchase healthy, safe, diverse foods, as well as services that are integral to maintaining nutrition, including healthcare, improved sanitation, and education. But this income can be also used to purchase unhealthy processed foods that can lead to overweight, obesity, and ill health.

An important factor determining whether people purchase nutritious or unhealthy foods is their relative cost. Healthy foods tend to be relatively expensive in poor countries, leading to low levels of consumption. For example, residents in low-income countries eat very little protein- and micronutrient-rich animal-sourced foods because these are cost-prohibitive. Adding to the problem, markets for nutritious foods—particularly perishable ones like eggs,
chicken, fish, fresh milk, fruits, and vegetables—may not exist, especially in low-income and low-density rural areas. These scenarios force households to depend on their own production or local agricultural systems, such as in the case of Ethiopia, where 90 percent of milk produced by rural households is consumed at home. The high cost of nutritious foods for the poor provides a strong rationale for nutrition-focused agricultural development; other economic sectors may be effective in boosting incomes, but only food policies can make nutritious foods more affordable (Chapter 2).

Gender shapes the links between agriculture and nutrition outcomes (Chapter 6). Participation in agriculture can give women increased decision-making power over resources, such as income and agricultural assets, which in turn can increase their empowerment to allocate food, health, and care within their households. Women’s time, energy expenditure, and the trade-offs they make when they participate in agriculture, such as spending time on childcare (or not), can affect their own nutritional status and that of their children. Given these links, many interventions focus on women. But women’s participation in agriculture–nutrition programs is not enough; focusing on gender equality within households, for example, by training male and female beneficiaries to make joint decisions, deserves more consideration.

A range of other agricultural factors impacts nutrition. Agricultural policies may exacerbate inequality, for example, if large farms are favored over smallholders. Agricultural hazards, including zoonotic and vector-borne diseases, and other food-safety risks can affect producer and consumer health. Agricultural practices may also lead to environmental degradation and subsequently poor health and nutrition, especially as agricultural areas face the growing challenge of climate change (Chapter 7). Ecological approaches, such as nutrition ecology, which acknowledge the complex interactions affecting food systems, can help us design locally relevant interventions that ensure both nutrition and resilience to climate change.

Another useful way of envisaging agriculture–nutrition links is the value-chain approach, which strives to retain or add nutrients to food through the phases of the food chain, from production and processing to marketing and consumption. Value chain interventions can address low demand for nutritious foods by educating consumers on the importance of nutritious diets, or improving the affordability and accessibility of these foods. They can also target low supplies of healthy foods, by for example, improving production with drought-tolerant varieties or improving infrastructure used to deliver food (Chapter 3).

**Country Policy Experiences**

Several countries have made notable efforts to integrate agriculture and nutrition goals, chalk up some substantial positive outcomes with a variety of national strategies. Lessons from these experiences can help guide policy and program design for other countries. Bangladesh has enjoyed one of the fastest prolonged declines in child stunting in the world and cut poverty in half during the past 15 years. These gains are attributed to economic growth; access to education; community-based health services; and sanitation, but also rapid growth in agriculture. The government has demonstrated a strong policy commitment to using agriculture as a vehicle for improving nutrition. For example, Bangladesh is the first country to develop a rice variety that is biologically fortified with zinc, in an effort to address micronutrient malnutrition. Its 2015 National Nutrition Policy uses multisectoral coordination to promote dietary diversity through nutrition-sensitive agriculture, including behavior change communication and food fortification, a first step toward helping the country diversify out of rice. And the Ministry of Agriculture has been piloting an initiative to identify which investments in agriculture can increase farm incomes, improve nutrition, and empower women (Chapter 15).

China’s National Nutrition Plan aims to produce nutritious and safe agricultural products, as well as to roll out national-level demonstration sites for research on nutritious staples and ways to safeguard nutrition along the food supply chain (Chapter 19). This linkage is a positive development, but the country’s roll-out of large-scale nutrition programs has also revealed the potential for unintended consequences—their focus on infants and children has left older people and the urban poor behind.

Ethiopia has achieved a decline in child mortality and an impressive reduction in stunting rates, from 51 percent in 2005 to 38 percent in 2016. Despite this progress, child wasting persists and children continue to eat monotonous, low-nutrient diets. Findings from Ethiopia’s Demographic and Household Survey and some landmark studies helped push policy makers to go beyond food production to address malnutrition (Chapter 16). Ethiopia’s revised National Nutrition Program (2013–2015) closely involved the agriculture sector; and the country’s second Program (2016–2020) includes strategic objectives and operational guidelines for both the agriculture and nutrition sectors. Ethiopia has also launched its first National Nutrition-Sensitive Agriculture Strategy, which calls on agriculture to address malnutrition through production and productivity, agricultural income, and women’s empowerment.

India has made great strides in food security, including passage of the National Food Security Act in 2013, which provides access to subsidized grains. However, the statute does not address micronutrient deficiencies or protein energy malnutrition (Chapter 17). The country’s new National Nutrition Strategy and draft Policy for Women show promise for better multisectoral integration, but major disconnects remain. Borrowing elements from a systems approach could help to close these gaps, such as looking at nutrition needs within households and devising ways to help especially vulnerable people.

Likewise, in Malawi, policies and programs center on grain production, in this case on maize, to the exclusion of more nutritious foods (Chapter 18). Recently, there has been a push (driven by donors, program implementers, and researchers) for Malawi’s agriculture sector to address malnutrition. A slow change is apparent in policy statements and documents but not yet within nutrition-
sensitive programming. There appear to be some promising approaches that the agriculture sector could adopt to easily increase multisector coordination.

**Policies, Programs, and Technologies**

Evidence on the effectiveness of a number of innovative policies, programs, and technologies shows the multiple benefits of linking agriculture and nutrition, but these approaches have not yet been widely adopted. For example, use of safety nets (including conditional transfers, school meals, public works) has proliferated during the past two decades, but programs that provide complementary components in both agriculture and nutrition remain scarce (Chapter 10). While combining transfers with agricultural investment and behavior change communication for nutrition has been shown to be effective, the best design for such an integrated program will vary with policy priorities and local context.

As countries turn their attention to malnutrition, many struggle with significant demographic shifts, such as urbanization, which (together with rising incomes) have given way to rising levels of overweight and obesity (Chapter 8). Economic growth and trade liberalization, which lead to changes in lifestyles and make processed foods more readily available, and a decades-long decline in the price of foods (such as cereals, beef, and milk) all contribute to this new nutrition challenge. Agriculture and, more specifically, distortionary agricultural incentives that lower the costs of calorie-dense diets relative to more diversified diets, play a role in the growing obesity epidemic in poor countries. Reforming these incentives, while continuing to provide social protection for farmers who may experience income losses, could help reduce overweight and obesity.

At a more global level, a number of research developments in recent years are charting the way forward. Biofortification—the process of increasing the density of vitamins and minerals in a crop through plant breeding, transgenic techniques, or agronomic practices—stands out as a success that is backed by solid evidence (Chapter 5). Evaluations carried out in Uganda and Mozambique found high adoption rates among farmers, higher inclusion of vitamin A in diets of women and children, and, in Uganda, improvement of children's vitamin A status. Biofortification could reach 1 billion people by 2030, and it has been ranked as one of the highest value-for-money investments for economic development.

Efforts to measure the impact of agricultural–nutrition interventions reflect growing interest in the potential of big data. Big data may have the power to “disrupt” agricultural systems for the benefit of nutrition—from helping farmers prepare for weather patterns to sending decision makers early famine warnings (Chapter 14). Supporting the contribution of data to knowledge and practice will require greater efforts to ensure that data are responsibly collected and used, freely accessible, and easily understood by policy makers and program implementers.

While much of the programmatic drive for “agriculture for nutrition” has come from development organizations, private sector businesses can improve nutrition outcomes by offering more nutritious foods. But a stronger private sector role depends on whether demand from consumers can be boosted through behavior change communication and price policies; whether the supply of healthy foods can be boosted through innovations such as fortification, technical support, and tax incentives; and whether business practices that harm nutrition and health can be effectively regulated (Chapter 11).

Universities, donors, and governments have joined hands to build capacity at individual, institutional, and system levels to carry out research in agriculture–nutrition and to design nutrition-driven agricultural projects (Chapter 13). Advances include integrating nutrition into curricula and creating cross-disciplinary programs. For example, USAID/Malawi introduced nutrition curricula into medical colleges and agriculture and natural resources universities, and UNICEF India developed a nutrition curriculum for agriculture professionals. Major research organizations are beginning to hire staff with cross-disciplinary competencies.

**Strengthening the Evidence and Moving to Action**

The past decade has seen significant advances in linking agriculture and nutrition within policy, research, program design, and implementation. Yet the knowledge gaps remain vast. Where should we be building evidence? The latest findings suggest that agricultural interventions with an orientation to production diversity, biofortification, dairy, and small livestock rearing can improve production and consumption of the specific commodities being promoted (Chapter 9). At times, these interventions even lead to increased household, maternal, and child dietary diversity. But with a few exceptions, agricultural interventions have yet to impact child stunting, underweight, or wasting. More and higher-quality evidence, based on strong research methodologies, is needed to elucidate how programs can enhance agriculture’s impact on nutrition outcomes and to assess the cost-effectiveness of integrated interventions.

Other topics that are critical to agriculture and nutrition have still not been explored. The contribution of value chains to nutrition, for example, especially those centered on micronutrient-rich, perishable foods such as fruits, vegetables, dairy, and animal-sourced products, is critically understudied. More evidence is also needed on how to manage biodiversity—the millions of species that support ecosystem services essential to agriculture, such as nutrient cycling, pest management, and pollination (Chapter 4). Critical questions include, how can we design smart biodiversity systems that prevent biodiversity loss while also promoting nutrition, and how can value be added to nutritious crops on the verge of extinction, to build demand for them once again?

Research is only one piece of the agriculture-nutrition puzzle: the research needs to be translated into programming. Creating an enabling environment for agriculture and nutrition is perhaps the most essential step
Every day, more evidence on the agriculture-nutrition nexus is being generated. Leaders in these sectors are stepping up to advocate for nutrition and multisectoral approaches. Capacity is being built up among local actors and within institutions to carry out this work. These critical efforts will exponentially improve the design and implementation of interventions and policies, help reshape the agricultural and food system, and achieve better nutrition for the world’s most vulnerable people.

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