

# Transforming Food Systems for a Rising India

Prabhu Pingali · Anaka Aiyar  
Mathew Abraham · Andaleeb Rahman

**T**ransforming Food Systems for a Rising India examines the interactions between India's economic development, agricultural production, and nutrition through a food systems lens. The Indian growth story is paradoxical. Despite multiple decades of economic growth, malnutrition and food insecurity persist. Growing populations and growing incomes have simultaneously increased demand for diet diversity and put pressure on agricultural systems. Rising trends in obesity along with non-communicable diseases, waxing regional inequality, and the looming influence of climate change forewarn us of a future public health crisis. This book provides an integrative Food Systems Approach (FSA) that captures these complexities while highlighting some of the major opportunities and challenges that lay ahead for creating a nutrition-secure future.



Agriculture is central to the overall economic development process. Issues of poverty, low productivity and malnutrition have all been linked to poor performance of the agricultural sector. Most of the scholarly work assessing the agricultural landscape, however, looks at economic growth, agricultural production and health outcomes as separate domains of enquiry.

Similarly in the public sphere, we see policies that increase productivity in agriculture at the expense of the environment, policies that increase economic growth while also increasing regional inequality and hurting small farmers, and top down policies that aim to reduce undernutrition without any discussion on how to tackle growing obesity. Policy recommendations, therefore, remain palliative at best, often treating the symptoms but not the core problems in the economy. Policy initiatives often do not consider the implications of the ever-changing economic, demographic and climatic landscape of the nation.

Drawing from and building upon the policy analysis and research at the Tata-Cornell Institute for Agriculture and Nutrition, *Transforming Food Systems for a Rising India* evaluates the intersectionality of these domains – economic growth, agriculture production, and health and nutrition – and their spillovers on the economic, ecological and health systems within the country of India. Greater demand for diet diversity, rapid urbanization, a rising middle class and a growing population now provides new opportunities to leverage urban growth for rural development. Given the challenges climate change poses to the stability of the food system, this book provides insights and policy recommendations for tackling some of the major issues facing nutrition security in the future.

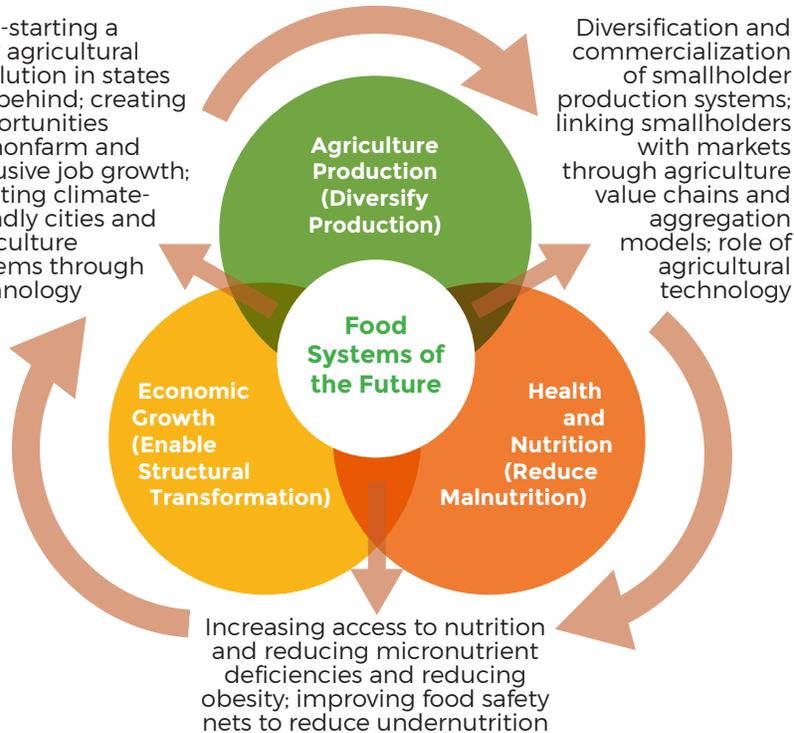
This book's central contribution is to provide an integrated framework to understand and address the biggest conundrums facing sustainable development efforts today. In order to implement a holistic approach towards human welfare and nutrition security, this publication links the goals for economic and agricultural development with health and nutrition using a Food Systems Approach. It brings together the latest data and scientific evidence from the country to map out the current state of the food systems and nutrition outcomes plus their future prospects.

India's nutritional challenge of stagnant under-nourishment and micronutrient deficiencies along with rising incidence of obesity is not unique. Neither is its experience of lagging rural areas as well as agriculture policies that emphasize staple grains, no matter the nutritional or environmental fallout. There are states in India whose structural transformation and economic growth story reflect the experiences of countries in Latin America, while other states perform less successfully than many countries in sub-Saharan Africa. Given India's vast diversity, complexity, and regional differences, other countries can certainly learn from its experiences. Hence, the analysis presented in this book offers important clues to both development practitioners and researchers working in India as well as in other developing countries.

In summary, this book: 1) Highlights the nature of food system challenges in India for 2050; 2) Provides goals and sets a food systems agenda for the different sub-national units in India based on their current structural transformation experience; and 3) Emphasizes policy and institutional interventions that are needed to address these challenges.

## FOOD SYSTEMS FOR A RISING INDIA

Kick-starting a new agricultural revolution in states left behind; creating opportunities for nonfarm and inclusive job growth; creating climate-friendly cities and agriculture systems through technology



Diversification and commercialization of smallholder production systems; linking smallholders with markets through agriculture value chains and aggregation models; role of agricultural technology

Increasing access to nutrition and reducing micronutrient deficiencies and reducing obesity; improving food safety nets to reduce undernutrition

*This 'Food Systems Approach' (FSA) accounts for the nexus between economic development, agricultural production, and nutrition. The motivation of a FSA is to pursue a developmental model that aims to a) expand opportunities to strengthen nutrition access and b) enhance capabilities of individuals to increase their own welfare. The main goals of the approach are to:*

- Create new opportunities and capabilities for increasing farm production and productivity
- Reduce malnutrition and improve labor productivity
- Facilitate greater structural transformation and reduce inequality

### KEY TAKEAWAYS

1. **The differential growth experience of Indian states can be explained by their initial investments in agricultural productivity growth and their subsequent focus on robust non-agricultural employment growth. (Chapter 2)**

Despite India's per capita GDP doubling over the last decade, there are stark differences in the regional growth experiences as reflected in nutrition and poverty indicators. Undernutrition in Madhya Pradesh remains high, but in Kerala, overweight and obesity are on the rise. Similarly, rural poverty in Punjab has reduced due to agriculture development, while in Odisha, low agricultural productivity has resulted in high rural poverty. Most Indian states have also experienced different levels of structural transformation. Less than 20% of the population remains engaged in agriculture in high-income states while that figure is over 40% in the low-income states. This chapter explains these differences in growth trajectories, by classifying Indian states into three categories – Agriculture-led states, Urbanizing states, and Lagging states. Authors show that comparative advantages that arise due to resource availability, institutional capacity and agro-climatic conditions initially placed states on different trajectories. Over time, investments in human capital, participation in global markets, and the differential growth of the non-agricultural sector along with increased labor mobility into non-farm sectors led some states to leap ahead.

2. **Meeting the growing urban demand for food and other agricultural products and nonfarm employment provides new growth opportunities for rural economies; the challenge is to ensure that it is inclusive of the poor. (Chapter 3)**

As India becomes increasingly urbanized, provisioning the cities becomes the new growth opportunity for rural areas and could lead to accelerated rural transformation. By leveraging the potential of small towns and the peri-urban spaces as a means to create new job opportunities, thus blurring the rural-urban distinction, the portfolio of economic opportunities available to rural households would diversify, thereby enabling greater rural income and improved access to food and nutrition. Livelihood diversification out of agriculture and into non-farm sectors could lead to an overall economy-wide increase in productivity as well as facilitate swifter structural transformation and poverty reduction.

3. **Diet transition and the rising demand for food diversity is not matched with a commensurate rise in the supply of non-staple foods, leading to poor access to more nutritious food. (Chapter 4)**

Protein rich items, such as pulses and animal-based foods, have seen an increase in prices as well as their volatility. The highly seasonal supply of fruits and vegetables and lack of storage infrastructure to smoothen prices makes access to nutritious food at affordable prices a challenge for consumers. At the same time, access to processed foods has increased significantly, even in rural areas, and often at prices that are substantially below those of more nutritious fresh food and pulses. While there is a declining share of staple grains (e.g., rice and wheat) in household diets across all income groups in urban as well as rural populations, the degree of transition varies considerably. It is clear that access to dietary diversity is not equitable and that the poor are significantly disadvantaged in this regard. Thus, the food security debate should move away from access to calories towards access and affordability of diverse and quality diets.

4. **While progress is being made on under-nutrition, the emerging nutrition transition towards obesity and the rising incidence of Non-Communicable Diseases requires a move away from policies that promote calorie sufficiency to ones that promote food system diversity. (Chapter 5)**

Over the last three decades, policy interventions have resulted in a decrease in undernourishment at the national level. However, undernutrition and micronutrient deficiency remain a critical public health challenge, especially in less developed states, while the number of overweight individuals has increased drastically in more developed states. The rising triple burden of malnutrition is a matter of great concern. This chapter presents evidence that diversifying diets, increasing income and improving access to food safety nets is vital for reducing malnutrition. Within households, improving education and information, behavior change, empowering women, and improving access to water, sanitation and health infrastructure is crucial to tackle undernutrition, hidden hunger and obesity.

5. **The objectives and design of India's safety net programs, whether food or cash based, need to evolve with economic growth and the changing nutritional needs of the marginalized populations. (Chapter 6)**

Safety nets have been an essential component of poverty reduction policies in India, providing income and nutrition assistance during different stages of an individual's life. However, safety nets of the future should account for changing economic and demographic structure, and changes in livelihood patterns. Safety nets need to be transformational rather than only focused on reducing vulnerability. Overall effectiveness of safety nets would depend largely on how they are combined with structural reforms and on long-term interventions designed to increase human capabilities and address structural poverty. Synergies between agriculture and safety nets, therefore, become important. For example, dovetailing public work and life-cycle based food assistance programs into the local agrarian economy could not only alleviate rural poverty, it would ensure long-term nonfarm rural development. Urbanization, especially, poses a challenge as well as opportunity in restructuring the safety net architecture. As India urbanizes, refocusing safety nets for urban poor and diversifying procurement of food grains will help tackle the dual problem of urban and rural food insecurity.

6. **Promoting small farm commercialization and diversification serves the dual objectives of enhancing farm incomes while improving the supply and access to food system diversity. (Chapter 7)**

Commercialization of smallholder farms is a necessary pathway to improved rural incomes and better access to diversified and nutritious food. However, poor access to markets, credit, inputs, technology, and extension services has hindered commercialization and made income opportunities inaccessible to many small farm producers. Meanwhile, increased demand for diversified and higher value crops can grow agricultural incomes as well as improve access to a varied food basket at the household level. To address the challenge of linking farms to markets, institutional interventions such as aggregation models, where smallholders organize themselves in groups to jointly access resources and market their produce, have been shown to mitigate some of the transaction costs associated with market entry. Smallholder participation in cooperatives and

farmer producer organizations may rectify disadvantages owing to low economies of scale and poor access to capital, technology, and mechanization and improve overall smallholder prosperity.

7. **Effective aggregation models, such as producer groups, can help reduce the high transactions costs of small farms accessing urban food value chains, especially for fresh food. (Chapter 8)**

Markets in India are highly fragmented and mostly unorganized with poor infrastructure, limiting their ability to cater to the quality requirements and specifications demanded by urban consumers. With increasing demand for quality and high-value agricultural produce, alternative value chains and newer marketing platforms have emerged. Vertical coordination (VC) by which retailers form direct linkages with farms, bypassing traditional markets, has been growing in India's more progressive states. VC can be more relevant for perishable crops and farmers in regions with good linkages to markets (e.g. Agriculture-led growth states) while futures and warehousing platforms can be useful for nonperishable commodities and can emerge in low potential areas such as those in lagging states. Institutional interventions, such as Farmer Producer Organizations (FPOs) and cooperatives, can reduce risks and transactions costs and offset scale disadvantages faced by small farms when supplying to modern value chains.

8. **Technology will continue to play a vital role in enhancing smallholder productivity and competitiveness, but it's time to look beyond staple grains and take a holistic view of the technological options for promoting a diverse food system. (Chapter 9)**

The green revolution is a landmark example of how scale-neutral technology – as in small and marginal producers could adopt it too – transformed agricultural production. As a result, the green revolution helped increase yields of wheat and rice, making many countries like India self-sufficient in these grains. The limitations of these technologies were that it was concentrated on a few staple crops and to high potential regions where irrigation was readily available, leading to inter-regional and intercrop disparities. Because of poor management, the environmental impact of these technologies was also high, leading to depletion of water tables and land degradation. Now, newer approaches to technological interventions need to help increase yields while limiting environmental externalities, especially with accelerating climate change risks. Biotechnology will be critical for increasing productivity, improving resilience to climate change and reducing environmental impact.

9. **Climate change can have significant adverse impacts on agricultural productivity, rural incomes and welfare; in addition, it can pose serious risks to the nutritive value of the food system since it can have a disproportionately higher effect on non-staple foods. (Chapter 10)**

Climate policies for the future should allow diversification of the food system in ways that enhance the environment while improving the nutrition content of foods produced and ensuring equity in access. In order to truly create a food system that ensures nutrition security of all individuals, climate change risks must not be understated and appropriate actions towards its mitigation need

to be adopted. Continuing down the current path of development without integrating adaptation and mitigation strategies will have serious negative repercussions on food security within the country. Understanding the pathways through which climate change will impact food security is essential to creating robust food systems.

**10. Food and agriculture policy need to transition from a focus on quantity to an emphasis on quality, diversity and safety; it should also leverage multi-sectoral synergies with economic growth, women's empowerment, improved access to clean drinking water and sanitation, and behavior change for promoting improved diets. (Chapter 11)**

The predominant focus of agricultural policy on the productivity growth of the major staples, like rice and wheat, resulted in significant inter-regional growth disparities and poor nutrition outcomes. While these policies played an important role in ensuring calorie sufficiency across the country, and thereby led to

substantial reduction in the incidence of hunger, they tended to inhibit diversification of the food system and limit the overall supply of micronutrient rich foods. In order to make substantial progress in tackling the problem of malnutrition – both micronutrient malnutrition and the emerging problem of obesity – India's food and agricultural policy needs to move towards promoting food system diversity.

Using a food systems approach, policies become multisectoral and integrative, giving priority to a) improving agricultural productivity with a view to increasing viability of smallholder agricultural systems; b) increasing economic growth to ensure greater structural transformation and regional prosperity; and c) linking agriculture and nutrition to ensure health and welfare growth go hand in hand. Linking the food systems development agenda to job creation and human capital investments will also be key to lower both regional and inter-personal inequality. Policy recommendations must be oriented towards creating a robust food system and moving the country towards a nutrition secure future.

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## CHAPTERS

1. Indian Food Systems towards 2050: Challenges and Opportunities
2. Economic Growth, Agriculture and Food Systems: Explaining Regional Diversity
3. Rural Livelihood Challenges: Moving out of Agriculture
4. Diet Diversity and the Declining Importance of Staple Grains
5. The Nutrition Transformation: From Undernutrition to Obesity
6. Reimagining Safety Net Programs
7. Enabling Smallholder Prosperity through Commercialization and Diversification
8. Linking Farms to Markets: Reducing Transaction Costs and Enhancing Bargaining Power
9. Agricultural Technology for Increasing Competitiveness of Small Holders
10. Managing Climate Change Risks in Food Systems
11. The Way Forward: Food Systems for Enabling Rural Prosperity and Nutrition Security

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**Prabhu Pingali** (plp39@cornell.edu) is Professor of Applied Economics at The Charles H. Dyson School of Applied Economics and Management and Founding Director of the Tata-Cornell Institute for Agriculture and Nutrition (TCI) at Cornell University. Pingali is a member in the U.S. National Academy of Sciences and an AAEA Fellow. • **Anaka Aiyar** (aa693@cornell.edu) is Post-Doctoral Associate with the Tata-Cornell Institute. Anaka obtained her PhD in Economics at the University of California, Riverside. Her research spans the areas of women and child health, over-nutrition and obesity, health insurance and health policy in emerging economies. • **Mathew Abraham** (ma947@cornell.edu) is Assistant Director of the Tata-Cornell Institute. He earned his PhD from the Department of International Economics and Management, Copenhagen Business School, Denmark. He has over 15 years of research experience in agricultural development, agricultural markets and food security in developing countries. • **Andaleeb Rahman** (ar687@cornell.edu) is Post-Doctoral Associate at the Tata-Cornell Institute. His research spans food policy, rural transformation and the political economy of development with a geographical focus on India. He wrote his doctoral dissertation at the Indira Gandhi Institute for Development Research (IGIDR), Mumbai.

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**TATA-CORNELL INSTITUTE FOR AGRICULTURE AND NUTRITION (TCI)**  
375 Warren Hall · College of Agriculture and Life Sciences · Cornell University · Ithaca, NY 14853-7801  
+1-607-255-4416 | [tci.cals@cornell.edu](mailto:tci.cals@cornell.edu) | [tci.cornell.edu](http://tci.cornell.edu) | @TataCornell

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