



Shaping Favorable Policies to Achieve Food Systems Diversity in India: An Agenda for Action

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The Technical Assistance and Research for Indian Nutrition and Agriculture (TARINA) project utilizes a “food systems approach” to promote increased access, availability, and affordability of diverse food. A food system includes all individuals, enterprises, and institutions that influence the supply, demand, consumption, and absorption of food and micronutrients. In India’s modernizing agricultural system, “positive demand elasticity for protein and micronutrient-rich food suggests the potential to ignite agriculture once again as a growth sector, link smallholder farmers to new market opportunities, and expand the dietary quality of food supply in order to tackle micronutrient and protein malnutrition” (Pingali, Ricketts, and Sahn 2015). Indian agriculture needs to move beyond its traditional focus on staple grains to proactively promoting food system diversity. In this policy brief, we propose a five-point pathway to achieve food systems diversity in India.

Recommendation 1: Encourage diversification of smallholder production systems towards more nutritious crops and livestock products

Affordability of non-staple foods for the urban and rural poor is a major concern in India today. In the past year, Indian news reports indicated massive food price inflation, especially with regard to pulses and certain vegetables. A recent study confirms that populations of many developing countries, including India, consume far fewer fruits and vegetables than those of higher income countries, a difference owing largely to lack of affordability in the developing countries (Miller et al. 2016). To address this problem, increased production of non-staple crops and livestock is an important way forward.

There are two potential policy routes identified as production diversification strategies. First, policymakers could revisit the Minimum Support Price (MSP) for major staples, such as rice and wheat, by encouraging producers and traders to respond to market signals rather than price floors. Freeing the market from price incentives that apply largely only to rice and wheat will mark a positive step in the direction of diversified production and increased consumption of fruits, vegetables, and pulses.

The second option is to introduce pulses, regionally appropriate millets, or other nutritious crops under the cover of the MSP and the Public Distribution System (PDS). Assured procurement of these nutritious crops will encourage farmers to increase production and also will subsidize the consumption of these crops for low-income consumers.

The promotion of animal husbandry for meat and dairy is equally important. While these efforts do not necessarily involve subsidies or market intervention, investment in programs for enhancing livestock productivity will be crucial for promoting smallholder livestock systems. While poultry production is on the rise in India, there is significant potential for expansion in goat and other small ruminant production systems.

Recommendation 2: Reduce inefficiencies in smallholder participation in value chains for nutritious crops

While the production of non-staples can be enhanced through policy measures and market intervention, reducing the costs and information barriers in postharvest management involves interventions along the value chain. Value chain

inefficiencies can lead to price fluctuations and volatility, straining farmer incomes and the purchasing power of urban and rural consumers. To strengthen the value chains, the following pathways are proposed.

Investment in food retail: Food retail in India is projected to grow strongly, and the smallholder farmer's stake in this growth must be captured, particularly by investing in agroprocessing industries and food retail enterprises that strengthen value chains and reduce transaction costs for farmers. This can raise farmers' incomes and generate employment opportunities, while also delivering high quality, high value food directly to consumers through farm-to-fork models.

Increase in storage and processing units: In order to reduce food wastage and also avoid the flooding of markets, it is necessary to increase the number of available cold storage facilities, warehouses, and processing units. The National Centre for Cold-Chain Development (NCCD) reported in 2015 that the Indian government had facilitated the construction of around 31.8 million tons of large cold storage space, compared to far less progress on creation of packhouses, or pre-cooler and dispatch rooms, as well as acquisition of refrigerated transport vehicles. Packhouses and transportation vehicles are mentioned by the NCCD as an important area for encouraging preservation of horticultural products, noting the existing infrastructure is more catered to storage of potatoes, dried chiles, pulses, and other less perishable products.

The present government's deliberations over the Goods and Services Tax (GST), which will introduce uniformity in taxes by imposing a single tax on supply of goods and services through combining central indirect and state indirect taxes, has the potential to improve the development of a national agricultural market. The impact of this legislation on farmer incomes and value chain efficiencies warrants further research.

Improvement in communication: Poor communication along value chains prevents

farmers from deciding on planting schedules, cropping patterns, and market information. There are several ways that modern communication tools, such as mobile phones and web portals, can deliver information to farmers. Studies find that mobile-enabled information services also reduce information barriers for female farmers (Mittal 2016).

Market development: The development of well-networked markets and distribution centers, as well as increased understanding of the flow and trade of food products, can improve the efficiency of trade routes and reduce transportation costs for distributors and traders. Given that 67 percent of India's farmers are marginal farmers with less than 2.5 acres of land, and 18 percent are small farmers with less than five acres of land (DAC 2011), streamlining the large production base through vertically integrated value chains has the potential to reduce instances of market failure. This development can also assist new entries in the market and usher in potential for a national integrated market.

Collectives, cooperatives, and producer organizations: Lastly, the utilization of organized cooperatives or farmer producer organizations (FPOs) for knowledge dissemination and market linkage is highly recommended. For example, FPOs can be focal points to the newly established electronic National Agriculture Market (eNAM). Another idea is the establishment of collectives for fruits and vegetable production, following the Amul dairy model. By consolidating smallholder farmers, either to access inputs in a model similar to the India Tobacco Company's e-Choupal, or to consolidate marketing like Amul, the resulting effect includes increased price bargaining power for farmers, as well as the sharing of best agricultural management practices.

Recommendation 3: Educate and create incentives to adopt environmentally sensitive agricultural management practices

Food systems are heavily reliant on production side environmental considerations. For example, when farmers face drought and soil erosion on a mass scale, the prices of nutritious crops rise sharply. We propose that government agricultural

extension services and development projects emphasize environmentally sensitive agricultural practices, or climate-smart agriculture.

There are three important elements to climate-smart agriculture: selection of climate-sensitive crops and seed varieties, efficiency in utilization of natural and man-made resources, and the adoption of agronomic practices that help to conserve resources and optimize productivity. These practices can also encourage production of nitrogen-fixing legumes, drought-resistant seed varieties, and adoption of intercropping and cover cropping techniques that are well known for improving soil structure and conserving water. As a climate risk adaptation strategy, crop diversification away from a cereal-based system toward short growth duration vegetables and legumes will also simultaneously ensure food system diversity.

Achieving this aim requires investment in research and technology and in extension services. Local knowledge on choices in seed varieties has dwindled, and there is need for deputation of technologically knowledgeable extension agents to inform smallholder farmers on agronomic practices and cropping patterns. For example, the production of water-intensive crops in water-sensitive areas is a largely unsustainable practice that is also partly promoted by policy measures. Thus, harnessing of specialized knowledge on best practices with seed varieties and cropping patterns, as well as efficiency in utilization of fertilizers and other man-made inputs, can combine to create a more economically profitable and sustainable model for farmers. Promoting climate-smart agriculture will ultimately impact the rural poor's ability to afford nutritious food.

Recommendation 4: Enhance consumer demand for more nutritious foods

The latest shifts within Indian consumption patterns demand attention. The increased consumption of fats among higher income consumers and the lack of affordability of nonstaple crops, with the resulting over-dependence on staple grains, among lower income consumers are two very important dietary shifts that threaten the health of the Indian population.

Obesity and micronutrient deficiency are two major epidemics that Indians face today, and attention to these problems is, in large part, determined by awareness and demand for healthier products.

One of the ways to increase demand for healthier products includes innovation in **marketing** for the delivery of new sources of protein, such as reconstituted soya dal or other nutrient substitutes, which derive from uncommon sources. There is considerable research and innovation taking place in supplements to improve nutrition, and effective marketing will increase consumption of these new products. Marketing in conjunction with educational messaging will increase consumer awareness with respect to the importance of a diet that includes fruits, vegetables, and livestock products.

Behavioral change communication (BCC) tactics help to understand Indian dietary preferences and practices. For example, certain vegetables lose their vitamin content when fried or boiled. Experimenting with local recipes to improve nutrient uptake requires increased research and innovation.

In addition to marketing and experimenting with new products, there is also a need for education on nutrition within **extension services and agricultural university curriculum** to increase awareness of the importance of both production and consumption of diverse foods. As yet, the linkage between agriculture and nutrition is weak, with very little attention given to the possibility of one solving the other, which can be addressed by informing a future generation of practitioners of the importance of diversified diets.

Recommendation 5: Trade policies that supplement deficits in domestic production and export surplus

There is great potential for growth in exports of surplus to avoid both food wastage and loss to farmers' incomes when domestic markets are saturated. For instance, the government-run Food Corporation of India (FCI) loses 21 million

tons of wheat to insects or spoilage every year and estimates state that 70 percent of fruit and vegetable output is lost each year (Biswas 2014). In the case of the current pulses deficit in India, developing stronger relations with pulse exporting countries, such as Mozambique, will be important in the future to ensuring a consistent import supply of pulses.

Not only will it be crucial to ensure imports to meet deficits, it is equally beneficial to develop export markets for selling domestic surplus. In particular, by investing in food processing technology and exploring India's competitive advantage in food exports, Indian farmers may be able to meet international demand and encourage foreign direct investment (FDI). As part of its latest "Make in India" initiative, the Indian government's Department of Industrial Policy and Promotion now allows 100 percent FDI in food processing and trade. As international food companies enter the Indian market, it is crucial to mobilize the participation of Indian smallholders and subsistence farmers. The potential of having an assured market with global companies will surely encourage growth of incomes for smallholder farmers.

Alongside the development of a food processing industry, it is also essential to upgrade standards for food safety. The technological advancement and infrastructural development is already rapidly underway in India for export. At present, India is a key exporter of cotton, rice, crustaceans, guar gum, and soybean meal (UN 2016). As more Indian food products

meet international food safety standards, the agroprocessing industry will grow and even access higher income markets, introducing employment opportunities for the growing rural and urban youth population.

Concluding remarks

A diverse food system can reduce chronic malnutrition, micronutrient deficiency, and other major diseases that hamper the productivity and health of India's population. The diversity of food systems is not relegated only to agricultural production. The importance of intervening at all levels of the food system, from production to consumption, is absolutely essential. The Department of Horticulture's latest report shows that horticultural production in India continues to increase each year, yet the majority of the Indian population cannot afford these fruits and vegetables. Massive wastage of perishable commodities, food price fluctuation, and food price inflation are major policy concerns that can be addressed through value chain infrastructural development.

This five-point policy plan for food system diversity spans from trade policy to transportation infrastructure, with the ultimate aim to reduce the barriers to entry for smallholders in non-staple crops. We are also proposing that education and marketing are tools to increase Indian consumer demand for nutritious food. This five-point policy plan points the direction towards a sustainable, inclusive, and diversified food system.

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This policy brief was derived from a public policy panel discussion on "Promoting Diversity in Food Systems for Improved Nutrition Outcomes in India," held by TCI in New Delhi on August 5, 2016, to celebrate the inauguration of the TARINA project. The discussion was led by six distinguished panelists from the government, academia, and the donor community.

(At the podium): Prabhu Pingali, Professor of Applied Economics at Cornell University and Director of TCI; panelists (from left to right): Purvi Mehta-Bhatt, Deputy Director and Head of Agriculture for South Asia at



the Bill & Melinda Gates Foundation; Ashok Gulati, Infosys Chair Professor at the Indian Council for Research on International Economic Relations (ICRIER); Shobha Shetty, Rural Development Sector Manager for the South Asia Region at the World Bank; Pramod Joshi, Director for South Asia at the International Food Policy Research Institute (IFPRI); and Suresh Pal, Member at the Commission for Agricultural Costs and Prices (CACP). Photo credit: Megan Witwer.