



Crop-neutral Agricultural Policy: Creating a Level Playing Field for More Nutritious, Non-staple Foods in India

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Although India is one of the world's most prolific agricultural powerhouses, its agricultural policy has been slow to respond to persistent problems of malnutrition. Currently, India faces the dual burden of overweight/obesity among its rapidly emerging urban middle class population and high rates of undernutrition and stunting among the poor, particularly in rural areas. Additionally, changing trends in consumption patterns have been occurring in India and in other developing countries, where rising incomes have spurred increased dietary diversification toward protein- and micronutrient-dense foods. As a result, Indian diets, which mainly consist of staple grains such as wheat and rice, are gradually shifting to incorporate a larger quantity and variety of non-staples, such as pulses/legumes, fruits, vegetables, and livestock products. However, production of these non-staple foods has lagged despite increasing demand.

Deliberate and explicit policies that support the diversification of agricultural production are needed to improve nutrition and meet the rising demand for non-staple foods. India's policy agenda for the past several decades has focused on improving staple grain productivity to meet national food security requirements and reduce hunger. While significant progress has been made toward this end, the food security challenge has evolved. It is no longer an issue of ensuring that sufficient calories are available, but rather one of enhancing food diversity and quality to address malnutrition in its many dimensions. Agricultural policies biased toward staple grains have limited ability to achieve positive nutrition outcomes

through dietary diversity. Thus, establishing a "crop-neutral" policy environment (i.e., one that removes biases toward a single crop or group of crops) is critical to creating a more robust and diversified food system that enhances the availability and affordability of nutritious foods (Pingali 2015).

In this brief, we examine trends in food consumption and production, as well as agricultural policy in India. We then propose policy recommendations toward a "crop-neutral" strategy that addresses nutritional challenges and corrects for market incentives favoring staple grains.

"Policies that promoted staple crop production, such as fertilizer and credit subsidies, price supports, and irrigation infrastructure (particularly for rice) tended to crowd out the production of traditional non-staple crops, such as pulses and legumes in India" (Pingali 2015, 587).

Diet transition—the declining share of staple cereals in diets

Food Balance Sheets from the Food and Agriculture Organization of the United Nations (FAO) show that the average calorie consumption in India was around 2,446 kcal/capita/day for the period 2011–2013, which is well below the global average of 2,876 kcal/capita/day for the same time period (Figure 1). Over the past four decades, average daily calorie consumption has risen by about 441 kcal in India and 507 kcal globally, but

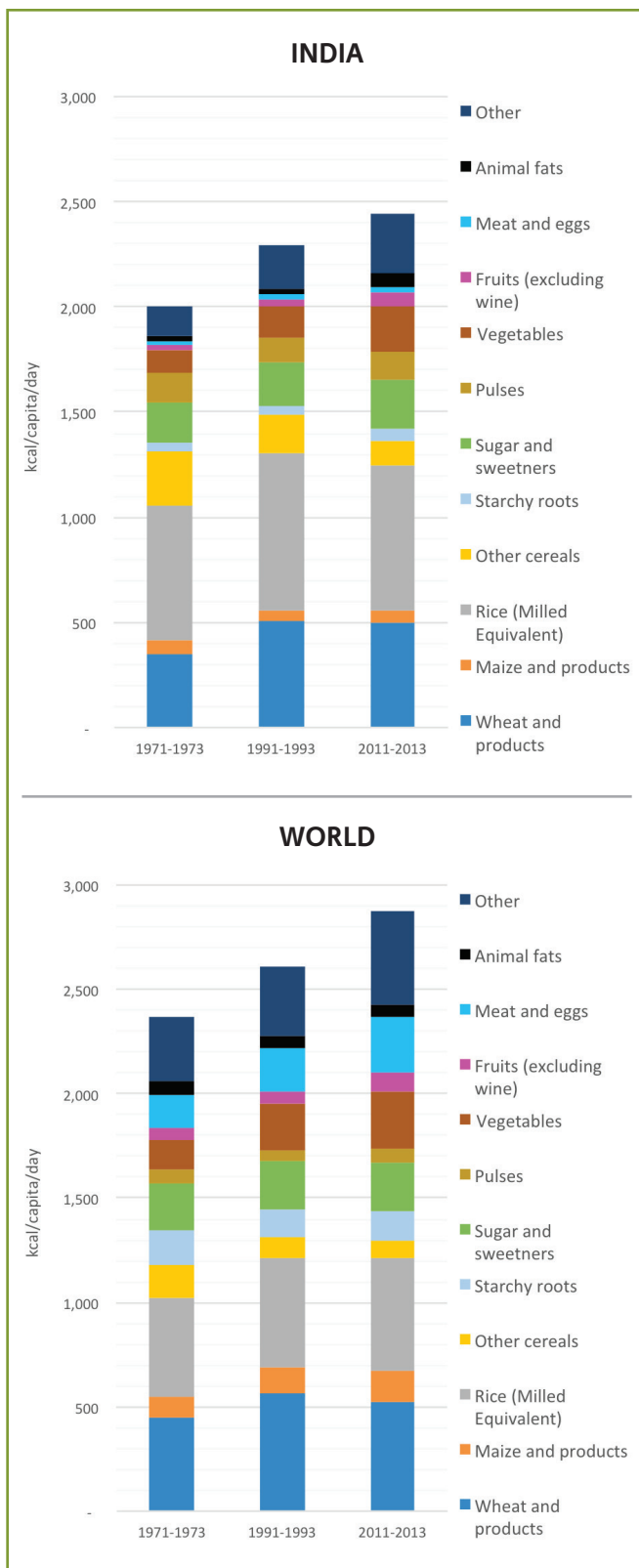


Figure 1. Indian average dietary composition by food group, 1971–2013 (top). Global average dietary composition by food group, 1971–2013 (bottom). Source: FAO 2017.

indications are that growth rates have slowed down. Furthermore, there have been significant changes in the distribution of calorie consumption by food group in India and the world at large, specifically a declining share of staple cereals in overall calories consumed since the 1990s.

The share of staple cereals in the average Indian diet has fallen from 57% for the period 1991–1993 to about 51% for the period 2011–2013, but still remains significantly higher than the share of staple cereals in the average global diet, which has fallen from 47% for the period 1991–1993 to 42% for the period 2011–2013. In absolute terms, India’s average per capita calorie consumption from staple grains has leveled off at around 1,250 kcal/capita/day, as compared to 1,213 kcal/capita/day globally, and is expected to decline in the coming decades.

The major sources of calories that are substituting for cereals include meat, dairy products, animal fats, vegetables, and sugars. Given that most of India’s population is vegetarian, vegetable fat consumption has more than doubled, rising from 101 kcal/day in 1970 to 210 kcal/day in 2010 (FAO 2014). These shifts in dietary patterns in India and other developing countries throughout the world have been largely driven by income growth, rapid urbanization, and global integration.

Data from India’s National Sample Survey (NSS) reveal that monthly per capita rice and wheat consumption has dropped across all income categories, except the poorest 5% of the population (Figure 2). Declining staple cereal consumption trends are observed among both urban and rural populations, though the rural areas experienced a larger rate of decline than urban areas. The NSS data also suggest rising diet diversity trends across rural and urban India as incomes rise.

Disconnect between staple cereal food demand and supply trends

From 1966 to 1985, India was a key beneficiary and pioneering country of the Green Revolution, which brought about widespread adoption of new technologies and improved seed varieties that dramatically raised rice and wheat yields throughout South Asia. Since the Green Revolution, India has had a steadily

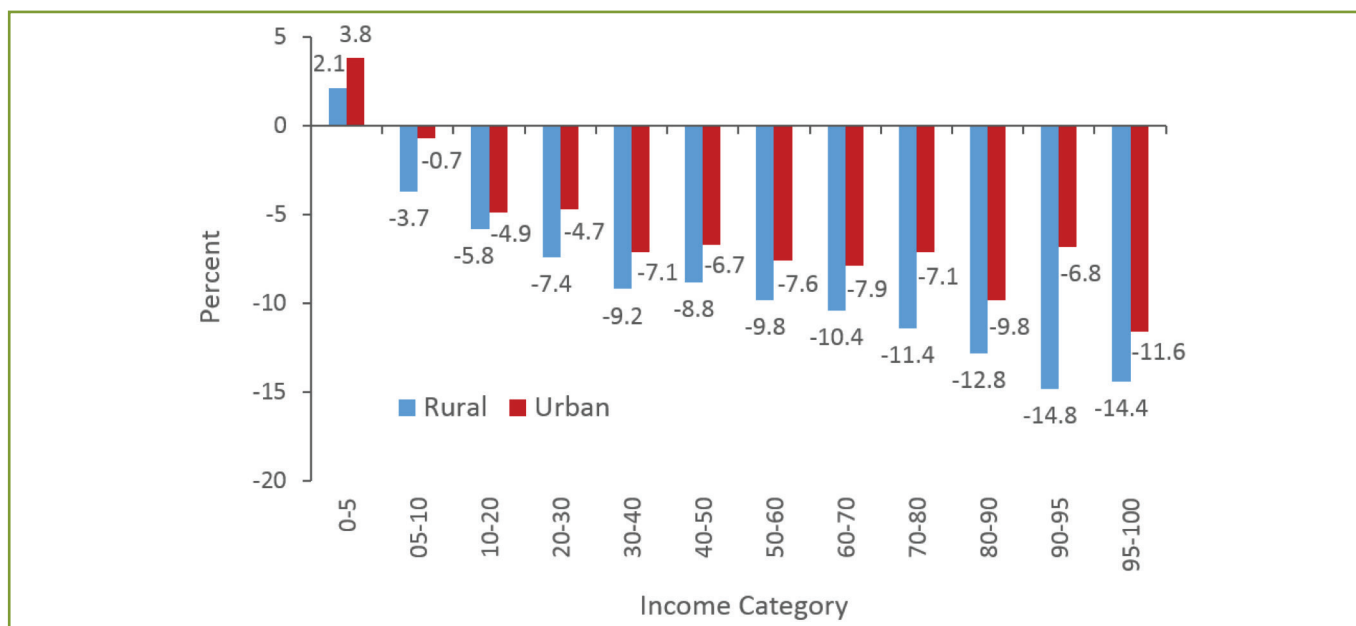


Figure 2. Percent change in monthly per capita staple cereal (rice and wheat) consumption in rural and urban India by income category, 1993/94–2004/05. Source: India National Sample Survey Office—Household Consumption Expenditure in India.

increasing surplus of staple cereal production over human consumption, as shown in Figure 3. The average surplus of staple cereal production over consumption was approximately 55 million tons for the period 2011–2013, with rice and wheat accounting for 68 percent.

Food grain surpluses are used for animal feed

(particularly, for maize) and for maintenance of stocks for food security (for rice and wheat). India has historically maintained high levels of food stocks, which increased further after the 2008 food price crisis. Pinstrip-Andersen (2015) empirically demonstrated that the magnitude of food stocks in India and other developing

countries was driven more by price support policies than by explicit policies, which were targeted toward managing food supplies. He argued that the rapid increase in food stocks was an (undesirable) outcome of price protections provided to farmers and consumers, in response to uncertainty created by global market instability.

India holds roughly 61 million tons of food stocks publicly, amounting to 38 percent of its annual food consumption requirements (Bhardwaj, Kumar, and Das 2014). The costs of holding these stocks are extremely high, and their disbursement has not been very effective, as has been documented by several observers

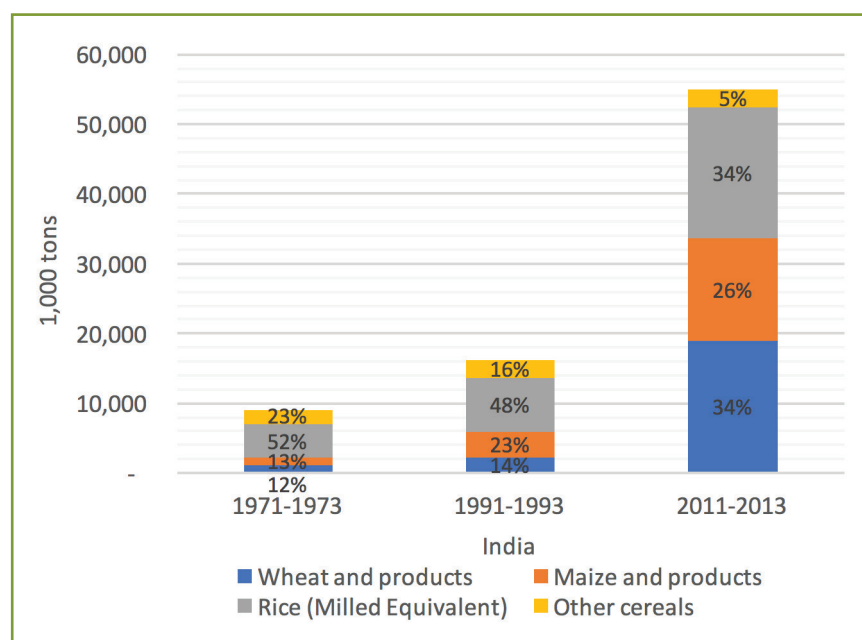


Figure 3. Difference between average total cereal production and average total cereal consumption as food in India, 1971–2013. Source: FAO 2017.

(Cummings, Rashid, and Gulati 2006; McKee 2012). Furthermore, the huge reserves held by India are subject to significant losses, estimated to exceed 20 percent (McKee 2012).

Responsibly releasing food stocks without causing a sharp decline in food prices has been a major postcrisis challenge. Many countries, including India, tend to hold onto their stocks despite the high cost of storage, rather than releasing them in large quantities, to avoid distorting market prices. Gradually weaning farmers and consumers of price subsidies for staple grains and encouraging production diversification into non-staple food crops and livestock products would help reduce inefficiencies in food stock management. Unless a “crop-neutral” policy environment is established, farmers will continue to overproduce staple cereals, thereby constraining India’s ability to diversify its food supply and meet the growing demand for non-staples (Pingali 2015).

According to figures from the Indian Ministry of Agriculture and Farmer Welfare (DES 2017), India’s total rice, wheat, and maize production for 2015–2016 was approximately 219.64 million tons. In comparison, the country produced 37.94 million tons of coarse cereals and 16.47 million tons of pulses, together totaling 54.41 million tons.

Why is producer response to the rising demand for non-staple foods so low?

In response to India’s exponential population growth, new technologies to enhance staple grain productivity were introduced during the Green Revolution in the late 1960s to meet national food security requirements and prevent a large-scale famine. While the technologies were successful, their widespread adoption throughout India has crowded out nutrient-rich, non-staple foods.

Today, the Green Revolution-era policy focus on staple grains continues to dominate India’s agricultural agenda. This is evidenced through the country’s excessively skewed policy environment, which predominantly favors wheat and rice production. These crops are also the mainstay of the country’s Public Distribution System (PDS) of

subsidized grain for the poor.

Along with the persistence of Green Revolution-era policies, poorly developed market infrastructure and high transaction costs are major barriers for producers, especially smallholders, who make up the majority of India’s farmers. It is harder for smallholders to integrate into modern value chains for pulses/legumes, fruits, vegetables, and livestock products, many which are perishables and, therefore, require more infrastructural support and investment in cold storage and information systems to facilitate speedy transport and hygienic storage. Training and extension services would also be necessary for farmers transitioning from staple grain to non-staple production systems. They require different skill sets, technologies, and knowledge of crops and their specific agroecosystems. The undersupply of agricultural extension services is therefore an additional constraint to the diversification of crop production.

If India’s prioritization of staple grains over a diverse basket of foods persists, then high production and transaction costs for non-staples will continue to prevent producers from meeting their rising demand. The resulting higher relative prices of non-staples will continue to act as a major impediment hindering access to a diverse diet.

“In India, the increasing price of legumes has been associated with a consequent decline in pulse consumption across all income groups” (Pingali 2015, 587).

Recommendations for creating a “crop-neutral” policy environment

Despite rising demand for non-staple foods, the persistence of Green Revolution-era policies in favor of staple grains, as well as structural impediments and a weak private sector, have limited supply responsiveness. Thus, establishing a “crop-neutral” policy environment that ensures a level playing field for the production and marketing of nutrient-rich non-staples is necessary to diversify agricultural production. Recommendations for creating a “crop-neutral” policy environment in India are outlined here.

Recommendation 1: Prioritize policies that create an “enabling environment” for the diversification of smallholder agricultural production systems toward more nutritious crops and livestock products.

1.1 Invest in connective infrastructure for market development. Investments that equip smallholder farmers to participate in market opportunities, specifically in mobile phone technology, would increase their ability to meet demand for diverse food products. Investments in roads, cold storage systems, and distribution and communication networks are needed in a low-infrastructure country like India for better connectivity to markets. Investments in market information systems and also have potential to reduce transaction costs for smallholders.

1.2 Ease institutional arrangements for smallholders’ market integration. Prioritize smallholders’ access to banks and credit to better facilitate their integration into value chains. Policies supporting household access to financial services and land registration have been found to increase farm productivity and market access for farmers (Dercon 2002). Cooperatives and other institutions can also help remove value chain inefficiencies and predatory middlemen to better integrate smallholder farmers into markets. For example, the Anand pattern of cooperatives, known as the Amul model, has been highly successful in reducing transaction costs, in providing value addition, and increasing market access for dairy producers (TCI 2016). This can be a model for organizing other high-value food producers in India.

Recommendation 2: Provide agricultural research and extension services that address nutritional and smallholder needs, including quality and safety standards training for high-value crops.

2.1 Improve the capacity of extension agents to implement nutrition-sensitive agriculture. Agricultural extension agents can provide frontline support for increasing production of nutrient-rich, non-staple food crops and livestock products (Babu, Gajanan, and Hallam 2017). Policies should aim to develop extension agents’ understanding of the connections between agriculture and nutrition, appropriate field-based interventions, and evaluation of interventions for learning and development of best practices.

2.2 Expand demand-driven agricultural research and extension services for smallholders¹ to improve knowledge dissemination and technology adoption for non-staple crops. Investments in agricultural research and extension are needed, especially technologies applicable to smallholder farmers in rainfed areas. Helping smallholders transition from staple grain production to more diversified systems requires transmission of new skills and knowledge, especially in labor-saving technologies², quality control, and safety standards for highly perishable horticultural crops. The Government of India has begun reforming its agricultural advisory services by shifting toward decentralized agricultural extension for farmer-driven solutions and innovations, mainly through the creation of the Agricultural and Technology Management Agency (Palis 2006). Expanding public-private partnerships for knowledge and technology dissemination should be prioritized to fill the service gaps by both sectors, with

¹ Using grassroots, participatory knowledge dissemination methods can expand access to services for hard-to-reach, remote farmers. In India, NGOs have been successful in implementing community-based, locally appropriate models of information dissemination, using information and communication technologies to reach small farmers (Sylvester 2015). Other approaches, like farmer field schools and farmer-to-farmer programs, have been more inclusive of smallholder and resource-poor farmers than traditional extension methods for adoption of new technologies (Palis 2006; Simpson et al. 2015)

² Reducing agricultural drudgery is especially important for women farmers, who have competing demands on their time and are typically assigned roles as the primary household food managers and child caretakers. This has implications for household nutrition.

an emphasis on the private sector's service capabilities being fully utilized to improve farmers' value-chain integration.

Recommendation 3: Eliminate policy biases toward staple grains and encourage production and consumption of non-staple foods, particularly among low-income households.

3.1 Replace producer and consumer price subsidies for staple grains with direct income support to poor households. Eliminating or scaling back price protection policies that subsidize the production and consumption of staple grains would help create a level playing field for non-staples. These policies could be replaced with income support through direct cash transfers to poor households. The provision of cash, as opposed to food rations, would give households the freedom to purchase the foods they need and/or want, including more expensive and nutritious non-staples. Furthermore, it would bolster farmers' incomes while also giving them the autonomy to make decisions about crop selection.

3.2 Explore conditional cash transfer (CCT) programs and/or expand existing CCT schemes to address food and nutrition security. The Government of India may want to consider implementing direct cash transfer programs that are conditional, as a way of encouraging behavioral change. Early CCT schemes were pioneered in Latin America, with Mexico and Brazil having the most notable programs. The main objectives of the CCTs are to reduce poverty and build capacity among the poor. CCT schemes can lower the high administrative costs and leakages associated with the delivery of food rations in India (Prabhu 2009). When comparing food and cash transfers from government-sponsored programs to poor households, "cash is likely to have a larger impact if the market provides opportunities to access diverse food products, thereby increasing dietary diversity" (Babu, Gajanan, and Hallam 2017, 237). In recent years, India has been experimenting with

explicit CCT schemes, such as the Dhanalakshmi, which was started in 2008 and is targeted toward expectant mothers' and girls' education (Prabhu 2009). The Ministry of Women and Child Development launched a pilot program that provides cash transfers to a poor household on the following conditions: registration of birth of a daughter; progressive immunizations; enrollment and retention in school; and an additional insurance benefit of Rs100,000, provided that the girl remains unmarried until at least 18 years of age (Prabhu 2009). CCTs in gender programs in India have potential for further expansion into the areas of diet diversity and nutrition.

3.3 Diversify India's Public Distribution System by including more nutritious, non-staple food crops such as pulses. Under the PDS, the government procures staple grains from farmers and redistributes them to poor households in the form of food rations. In recent years, expansion of the PDS to include more nutritious non-staples, as a means of increasing their production and diversifying the diets of low-income households, has been debated. Pulses have been at the center of this debate. The government has been exploring their potential for inclusion in the PDS. However, serious concerns have been raised about the high risk and cost associated with marketing and storing perishables. Although pulses are only semi-perishable, some argue that their procurement still would be far too costly for the government due to the shortage in supply (Joshi, Kishore, and Roy 2016) and therefore favor implementation of a cash transfer program (see Recommendation 3.1) as a way to encourage the production and consumption of non-staples among low-income households. The government will need to conduct multiple trials and evaluate both of these policy options to determine which is most effective, from cost and impact perspectives. Perhaps, the solution will be a combination of the two policy options, as one may be more effective in certain states, regions, or localities than in others.

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- Babu, Suresh C., Shailendra N. Gajanan, and J. Arne Hallam. 2017. "Agriculture, Nutrition, Health: How to Bring Multiple Sectors to Work on Nutritional Goals." In *Nutrition Economics: Principles and Policy Applications*, Ch. 15, 315–25. San Diego: Elsevier Academic Press.
- Bhardwaj, M., M. Kumar, and K. N. Das. 2014. "Factbox – India's food Stockpiling and WTO Stand-off." *Reuters*. India, July 29. <http://in.reuters.com/article/uk-india-trade-stockpiles/factbox-indias-food-stockpiling-and-wto-stand-off-idINKBN0FY1AM20140729>
- Cummings, R., Jr., S. Rashid, and A. Gulati. 2006. "Grain Price Stabilization Experiences in Asia: What Have We Learned?" *Food Policy* 31 (4): 302–12.
- Dercon, Stefan. 2002. "Income Risk, Coping Strategies and Safety Nets." *World Bank Research Observer* 17 (2): 141–66.
- DES (Directorate of Economics and Statistics). 2017. "Agricultural Statistics at a Glance 2016." Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Government of India, New Delhi.
- FAO (Food and Agriculture Organization of the United Nations). 2014. "Food Outlook: Biannual Report on Global Food Markets." May, FAO, Rome.
- FAO (Food and Agriculture Organization of the United Nations). 2017. FAOSTAT. FAO, Rome. <http://www.fao.org/faostat/en/#home>
- Joshi, P. K., Avinash Kishore, and Devesh Roy. 2016. "Making Pulses Affordable Again: Policy Options from the Farm to Retail in India." SSRN Scholarly Paper ID 2839936, Social Science Research Network, Rochester, NY. <https://papers.ssrn.com/abstract=2839936>.
- McKee, D. 2012. "Strategic Grain Reserves." In *Grain Reserves and the Food Price Crisis: Selected Writings from 2008–2012*, edited by B. Lilliston and A. Ranallo, 33–35. Washington, DC: Institute for Agriculture and Trade Policy.
- Palis, Florencia G. 2006. "The Role of Culture in Farmer Learning and Technology Adoption: A Case Study of Farmer Field Schools among Rice Farmers in Central Luzon, Philippines." *Agriculture and Human Values* 23 (4): 491–500.
- Pingali, Prabhu. 2015. "Agricultural Policy and Nutrition Outcomes—Getting beyond the Preoccupation with Staple Grains." *Food Security* 7 (3): 583–91.
- Pinstrup-Andersen, P., ed. 2015. *Food Price Policy in an Era of Market Instability—A Political Economy Analysis*. London: Oxford University Press.
- Prabhu, K. Seeta. 2009. "Conditional Cash Transfer Schemes for Alleviating Human Poverty: Relevance for India." Discussion Paper, United Nations Development Programme, India. http://www.in.undp.org/content/dam/india/docs/cct_dp.pdf
- Simpson, Brent M., Steven Franzel, Ann Degrande, Godfrey Kundhlande, and Sygnola Tsafack. 2015. "Farmer-to-Farmer Extension: Issues in Planning and Implementation." May, MEAS Technical Note, Modernizing Extension and Advisory Services, USAID, Urbana, IL. <https://agrilinks.org/sites/default/files/resource/files/MEAS%20TN%20Farmer%20to%20Farmer%20-%20Simpson%20et%20al%20-%20May%202015.pdf>
- Sylvester, Gerard, ed. 2015. "Success Stories on Information and Communication Technologies for Agriculture and Rural Development." RAP Publication 2015/02, Food and Agricultural Organization, of the United Nations Regional Office for Asia and the Pacific, Bangkok. <http://www.fao.org/3/a-i4622e.pdf>
- TCI (Tata-Cornell Institute for Agriculture and Nutrition). 2016. "Tata-Cornell Institute 2016 Annual Report." Cornell University, Ithaca, NY.
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